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ABSTRACT

This report profiles the demographic and employment characteristics of doctorate-level scientists and engineers in the United States. The data presented were collected through the 1995 Survey of Doctorate Recipients (SDR). The purpose of the SDR is to estimate the number of people holding research doctorates from U.S. institutions in science and engineering who reside in the United States and to characterize their demographic and employment patterns. The report is organized as follows: chapter 1 describes the size and composition of the doctorate-level scientist and engineer population including such characteristics as gender, race/ethnicity, citizenship, and age; chapters 2 and 3 profile the employment status of these doctorates in 1995; chapter 4 focuses on postdoctoral appointments held by doctoral scientists and engineers; chapter 5 discusses second jobs held; chapter 6 presents data on changes in employment for the population since 1993; chapter 7 presents data on articles published, papers presented at conferences, and inventions patented by doctoral scientists and engineers; and chapter 8 describes professional development activities. Appendices include information on SDR research methods, a copy of the survey cover letter and questionnaire, definitions of terms, lists of Ph.D. fields studied, and occupation codes. (WRM)

Doctoral Scientists and Engineers in the United States: 1995 Profile

Division of Science Resources Studies
Directorate for Social, Behavioral and Economic Sciences

National Science Foundation
November 1998

Doctoral Scientists and Engineers in the United States: 1995 Profile

Kelly Kang, Project Officer

Division of Science Resources Studies
Directorate for Social, Behavioral and Economic Sciences

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FOREWORD

This report was written by the National Research Council (NRC) under contract to the National Science Foundation, Division of Science Resources Studies. It was originally published in April of 1998, under the same title. A limited number of copies were printed by the NRC, which then gave NSF permission to print additional copies of the report. It is reprinted here with some revisions/clarifications.

Additional detailed data on doctoral scientists and engineers can also be found in *Characteristics of Doctoral Scientists and Engineers in the United States: 1995*, NSF 97-319 and in *Science and Engineering Indicators 1998*, NSB 98-1. If you have additional ideas for analyses of the Survey of Doctoral Recipients, please contact Susan T. Hill Director for the Doctorate Data Project (sthill@nsf.gov).

Jeanne E. Griffith
Director
Division of Science Resources Studies
National Science Foundation

November 1998

ACKNOWLEDGMENTS

The conduct of the 1995 Survey of Doctorate Recipients, maintenance of the resulting data file, and publication of this report were funded by the National Science Foundation (NSF). Kelly Kang, who served as project officer for NSF, Susan Hill and Nirmala Kanankutty of NSF assisted the project staff of the Office of Scientific and Engineering Personnel (OSEP) with helpful advice on the draft report.

The 1995 survey was conducted under the administrative supervision of Susan Mitchell and Peter Henderson. Prudence Brown and Peter Henderson analyzed the survey results and drafted the text. Julie Clarke prepared the report's figures and Martha Bohman prepared the tables and finalized the manuscript for publication.

Special appreciation is expressed to Eileen Milner, who supervised the coding and editing of the data, and to her data processing support staff-Kevin Williams, Gedamu Abraha, and Kevin Kocur. Thanks are also extended to Cindy Woods, senior analyst, and SiuChong Wan, statistical programmer, who were responsible for system design and file generation.

This report has been reviewed by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the NRC's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the authors and the NRC in making the published report as sound as possible and to ensure that the report meets institutional standards for objectivity and evidence. The content o the review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their participation in the review of this report: Stephen J. Lukaski, independent consultant; and Carol B. Lynch, University of Colorado. While the individuals listed above provided many constructive comments and suggestions, responsibility for the final content of this report rests solely with the authors and the NRC.

The work of this report was overseen by the Advisory committee of OSEP, which is concerned with the activities of the National Research Council that contribute to the effective development and utilization of the nation' scholars and research personnel. During the development of this report, Charlotte V. Kuh, Executive Director of OSEP, provided helpful guidance, as did Marilyn Baker, Associate Executive Director.

Finally, thanks go to all of the doctorate recipients who have completed the survey over the years. Without their continuing cooperation, this survey project would not be possible.

M.R.C. Greenwood, *Chair*
Advisory Committee
Office of Scientific and Engineering Personnel

[from the original NRC publication]

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INTRODUCTION

This report profiles the demographic and employment characteristics of doctorate-level scientists and engineers in the United States in a descriptive manner. The data presented in the report were collected through the 1995 Survey of Doctorate Recipients (SDR), twelfth in a series of surveys initiated in 1973 by the National Research Council (NRC) in response to the needs of the federal government for demographic and employment information on scientists and engineers trained at the doctoral level. This survey is sponsored by NSF, NIH, and DOE.

The purpose of the SDR, since its inception, has been to estimate the number of people holding research doctorates from U.S. institutions in science and engineering who reside in the United States and to characterize their demographic and employment patterns. The sampling frame for the SDR is the Doctorate Records File (DRF), a census of all research doctorates earned in the United States since 1920. The SDR sample for 1995 included 49,829 doctorate-level scientists and engineers, drawn from a population of 594,300. This report focuses on those doctorates who earned their degrees in a science or engineering field from a U.S. institution between January 1942 and June 1994 and were age 75 or younger and residing in the United States in April 1995. The estimated size of this population is 542,500.

This profile report is organized as follows: Chapter 1 describes the size and composition of the doctorate-level scientist and engineer population, including such characteristics as gender, race/ethnicity, citizenship, and age. Chapters 2 and 3 profile the employment status of these doctorates in 1995. Special attention is given to the academic sector. Chapter 4 focuses on postdoctoral appointments held by doctoral scientists and engineers, and Chapter 5 covers second jobs held. Chapter 6 presents data on changes in employment for the population since 1993. Chapter 7 presents data on articles published, papers presented at conferences, and inventions patented by doctoral scientists and engineers. Chapter 8 describes professional development activities.

Appendix A discusses survey methods and outcomes, including response rates, sampling and nonsampling errors, and weighting procedures. Appendix B contains a copy of the survey cover letter and questionnaire. Appendix C provides a description of terms used in the text and tables. Appendix D is a list of the Ph.D. fields covered by the SDR and aggregated into the broad groups shown in this report. Appendix E contains the occupation codes aggregated into broad groups.

1

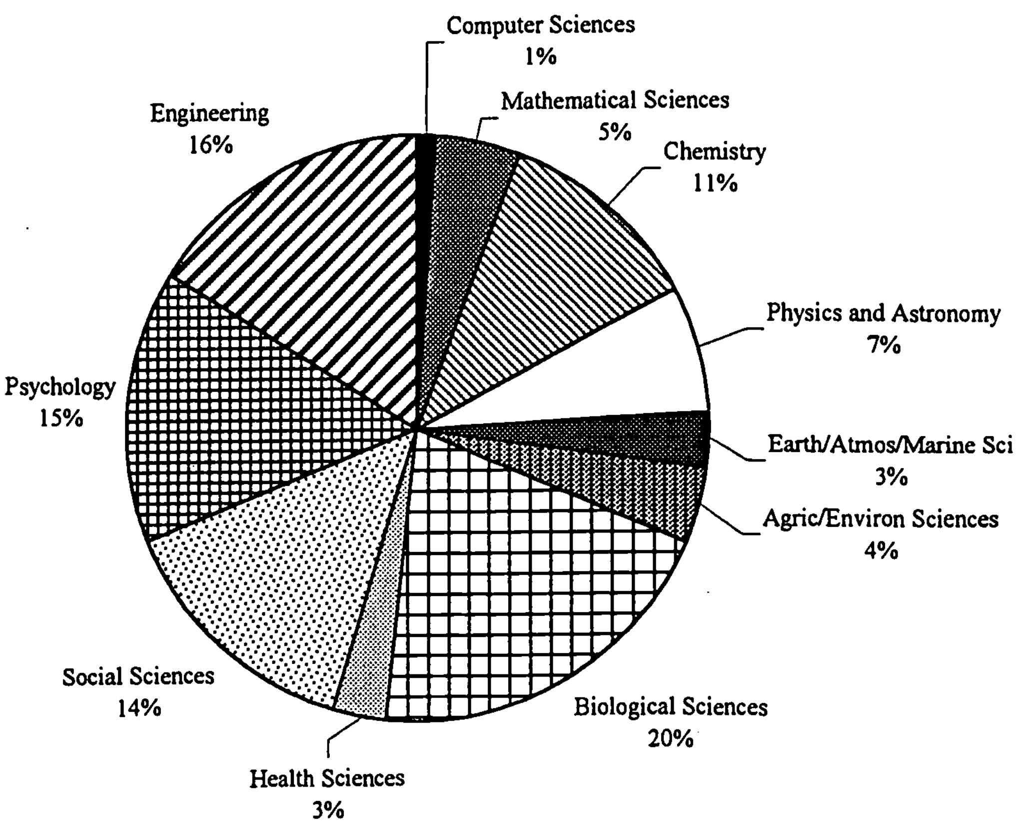
DOCTORAL POPULATION IN THE SCIENCES AND ENGINEERING

Distribution by Field

The estimated population of science and engineering doctorates[1] in 1995 was 542,500. For this project, the population was defined to include Ph.D.s who earned their degrees in a science or engineering field from a U.S. institution between January 1942 and June 1994 and who were age 75 or younger and residing in the United States in April 1995.

- Twenty percent of the science and engineering Ph.D. population was composed of doctorates in biological sciences (see Table 1).
- The next largest components were engineering doctorates (16 percent), psychology doctorates (15 percent), and social science doctorates (14 percent).

FIGURE 1. Science and engineering Ph.D. population, by field of doctorate, 1995.



[1] Appendix D provides a list of detailed science and engineering Ph.D. fields and shows how they were grouped into the broad fields used for analysis in this report.

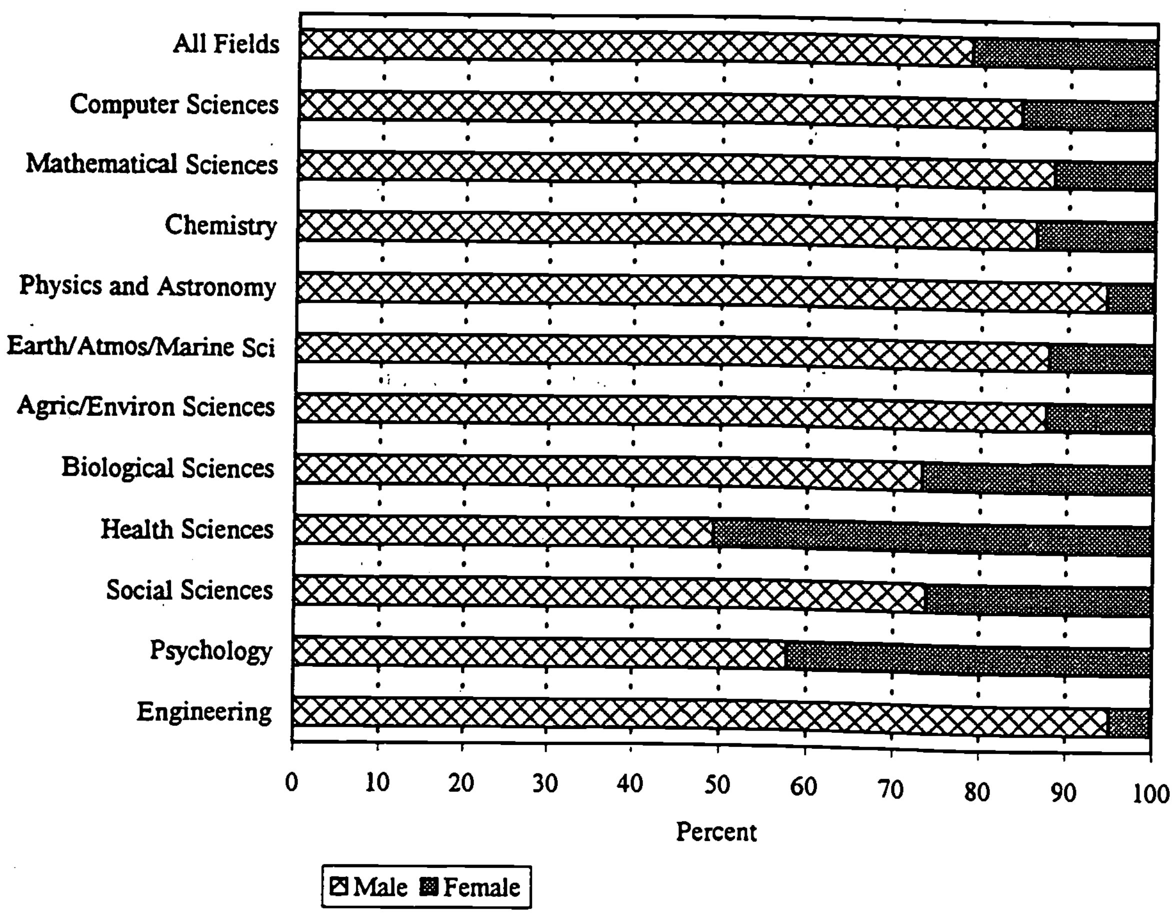
Demographic Characteristics

Demographic characteristics of science and engineering Ph.D.s, including gender, race, age, and citizenship are described in this section (see Tables 2 and 3).

Gender

- Women comprised 22 percent of the U.S. population of science and engineering doctorates in 1995.
- The fields of health sciences and psychology had the highest representation of women (51 and 42 percent, respectively). The fields with the lowest proportion of women were engineering and physics/astronomy (5 and 6 percent, respectively).
- The proportion of female science and engineering Ph.D.s has grown with each successive cohort. Only 8 percent of the group that earned its doctoral degrees more than 25 years earlier were women, while 34 percent of the doctorates from the most recent 5-year cohort were women (see Table 3).

FIGURE 2. Field composition of science and engineering Ph.D.s, by gender, 1995.



Race/Ethnicity (regardless of citizenship status)

- The population of science and engineering doctorates was 84 percent white, 12 percent Asian, 2 percent black, 2 percent Native American, and less than 1 percent Hispanic.

- Asians comprised 29 percent of the doctorates in computer sciences and engineering.

- The highest concentrations of blacks were in health and social sciences, both 4 percent.

- The racial/ethnic composition of science and engineering Ph.D. cohorts changed over time as each successive cohort included a higher proportion of Asians, Native Americans, and blacks. Of the doctorates who earned degrees more than 25 years earlier, 6 percent were Asian; for the most recent 5-year cohort, the proportion who were Asian was 22 percent. Looking at these same two cohorts, the proportion of doctorates who were Native American increased from 1 to 4 percent, and the proportion who were black increased from 1 to 3 percent.

Age in 1995

- Of all science and engineering doctorates, 42 percent were age 44 or younger. Doctorates age 55 or older accounted for 25 percent of the population.

- The youngest doctorates were in computer sciences: 81 percent were age 44 or less. Chemistry had the highest proportion of doctorates age 55 or older (31 percent).

Year of Doctorate

- About 7 percent of all science and engineering doctorates received their degrees before 1960. Another 44 percent were earned between 1960 and 1979, and 50 percent were earned after 1979.

- Fifty-one percent of the degrees in computer sciences were earned since 1989, due primarily to the burgeoning number of programs in that field. A relatively high proportion of health science doctorates were also earned within the most recent 5 years—30 percent, compared with 19 percent for science and engineering doctorates overall.

- Thirteen percent of chemistry doctorates received their degrees before 1960, the highest proportion by field, compared with 7 percent of science and engineering doctorates overall.

Citizenship Status

- Eight percent of science and engineering doctorates were foreign citizens in 1995 (including both permanent and temporary residents).

- Computer sciences and engineering had the highest proportions of foreign citizens, 28 and 16 percent, respectively. The lowest proportion (2 percent) was in psychology.

- Foreign citizens comprised 24 percent of science and engineering doctorates earned within the most recent 5 years.

2

EMPLOYMENT AND UNEMPLOYMENT

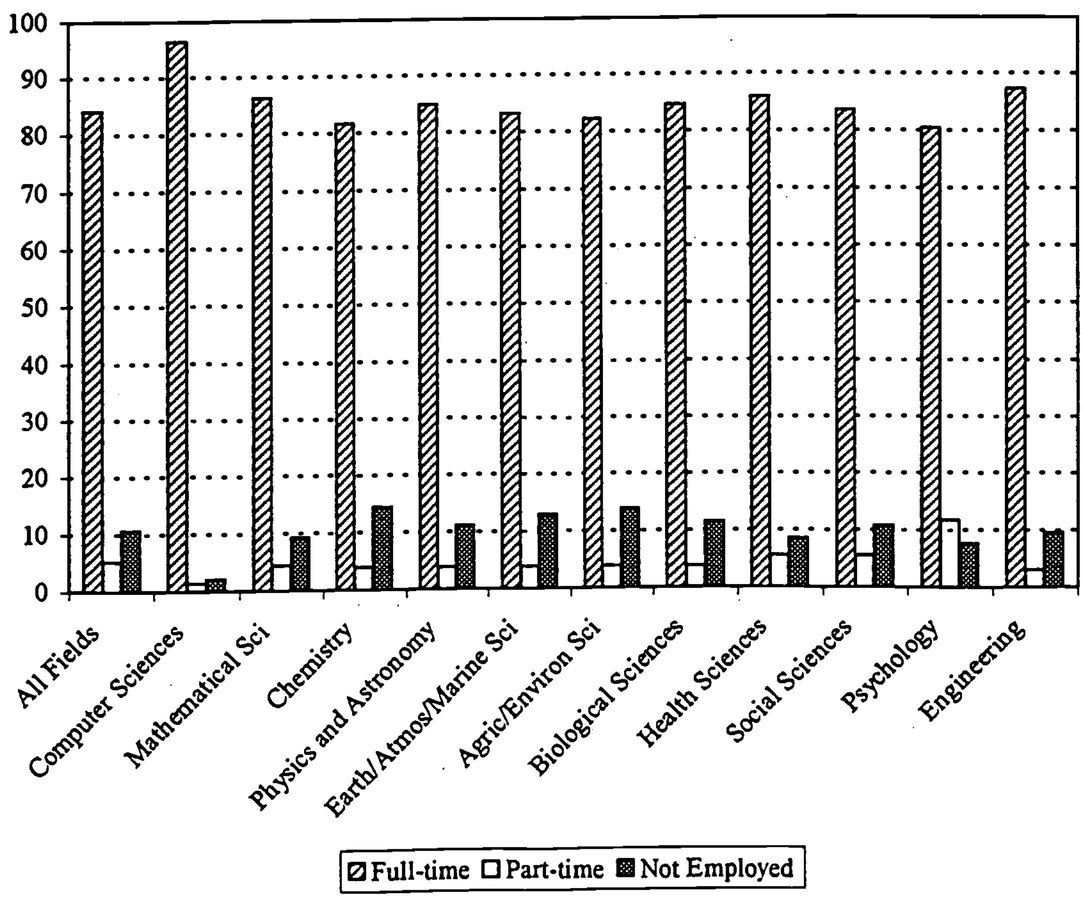
Employment Status

This chapter presents the employment status of science and engineering doctorates in 1995, describing the proportions who were employed full-time, employed part-time, or not employed (including those seeking employment, those retired, and all others not working). Those who held postdoctoral appointments were included as either full-time employed or part-time employed as appropriate.

- In 1995, 84 percent of science and engineering doctorates were employed full-time. By field of doctorate, full-time employment rates ranged from a high of 97 percent in computer sciences to a low of 81 percent in psychology (see Table 4).

- Just over 5 percent of the science and engineering doctorates were employed part-time. Part-time employment was highest for psychology doctorates (12 percent) and lowest for doctorates in computer sciences (1 percent).

FIGURE 3. Science and engineering Ph.D.s, by field and employment status, 1995.



- The remaining 11 percent of the science and engineering doctorates were not employed, the majority of whom (8 percent of the total population) were retired. Chemistry and agricultural/environmental sciences had the highest proportions retired, 11 percent each. In computer sciences, where 99 percent of the doctorates were under age 55, no one was retired.

Reasons for Not Working

- As previously mentioned, retirement was the status of the large majority of those not working and consequently was the most frequently named reason for not working (72 percent cited this reason). After retirement, the reason most frequently given was "suitable job not available" (10 percent), followed by "did not need or want to work" (9 percent) (see Table 5).

Reasons for Working Part-Time

- Of all those working part-time, 36 percent said they were doing so because they "did not need or want to work full-time." Among psychology doctorates (the group with the highest proportion employed part-time), 43 percent cited this reason for working part-time (see Table 6).

- The second most frequent reason, "retired or semi-retired," was cited by 33 percent of the science and engineering doctorates who held part-time employment. Approximately one-half of chemistry and physics/astronomy doctorates employed part-time cited this reason.

- Twenty-five percent of science and engineering doctorates employed part-time gave "family responsibilities" as a reason. This reason was most frequently cited by psychology doctorates (40 percent).

- The reason "suitable full-time job not available" was chosen by 22 percent of those part-time employed. This reason was cited most frequently by physics/astronomy doctorates (35 percent).

Unemployment Rates

When those who were retired and those who were not employed and not seeking work are removed from the data set, the residual is the labor force. In 1995 the size of the science and engineering labor force was 492,100 (compared with 542,500 in the total science and engineering population). The labor force is used as the base in unemployment rate calculations because it excludes those who are voluntarily not employed. The unemployment picture of science and engineering doctorates is examined in this section.

- In 1995, 1.5 percent of all science and engineering doctorates in the labor force were unemployed and looking for work. Chemistry doctorates, at 2.2 percent, had the highest unemployment rate, whereas computer sciences and social sciences had the lowest rates, 0.9 percent and 1.1 percent, respectively (see Table 7).

- By gender, there was no difference in the unemployment rate for science and engineering doctorates overall. Two fields, however, had notable differences in the rates by gender: physics/astronomy with female unemployment rates at 3.7 percent compared with men at 1.4 percent and engineering with rates for females at 4.7 percent compared with 1.6 percent for men.

3

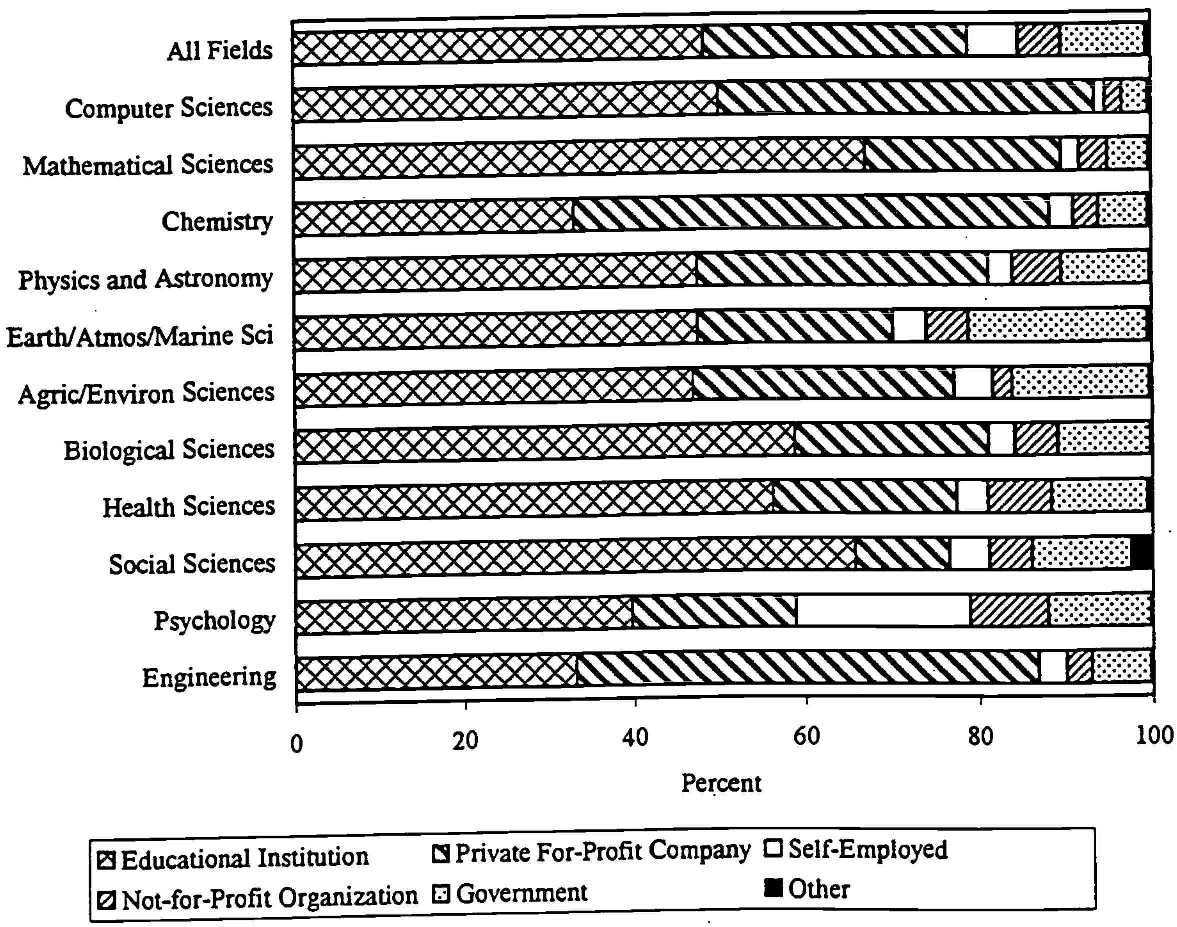
PRINCIPAL JOB

Employment Sector

In 1995, 49 percent of science and engineering doctorates were working in educational institutions, primarily 4-year colleges and universities. Another 30 percent were employed in private for-profit companies and 6 percent were self-employed. Local, state, and federal governments employed 10 percent of science and engineering doctorates and not-for-profit organizations accounted for 5 percent (see Table 8).

- Mathematical and social sciences had the highest proportions of doctorates employed in educational institutions (67 and 66 percent, respectively), while chemistry and engineering had the lowest (33 percent for each field).

FIGURE 4. Employed science and engineering Ph.D.s, by sector of employment and field, 1995.



- Chemistry and engineering doctorates were most likely to be employed in private for-profit companies (55 and 54 percent, respectively). Only 11 percent of social sciences Ph.D.s were similarly employed.

- Twenty percent of psychology Ph.D.s were self-employed. Doctorates in this field were also most likely to work in not-for-profit organizations (9 percent, compared with 5 percent of the total).

- Earth/atmospheric/marine sciences doctorates were employed in government at the highest rate, 21 percent.

Occupation

Occupation[2] was defined on the survey as the "kind of work you were doing on your principal job held during the week of April 15, 1995." Thirty-eight percent of science and engineering doctorates were working as scientists (including social scientists and psychologists), 28 percent were postsecondary teachers of science or engineering, 13 percent were top/mid-level managers, and 9 percent were engineers. These occupations were distributed differently within employment sectors and by years since doctorate (see Tables 9 and 10).

- Predictably, most of those working in educational institutions were teachers (62 percent), but 8 percent were top/mid-level managers, including deans, administrators, and department chairs. Another 27 percent were scientists or engineers, with biological scientists being the largest single component of this group (10 percent of the total in educational institutions).

- In private for-profit companies, 21 percent were engineers, 19 percent were top/mid-level managers, and 11 percent were chemists.

- Nearly one-half of those self-employed were psychologists (48 percent).

- The occupations most frequently listed by those in private not-for-profit organizations were top/mid-level managers (21 percent), psychologists (19 percent), and biological scientists (13 percent). These same occupations were the three largest components of the government sector (18, 12, and 15 percent, respectively).

- As years since the doctorate increased, the proportions who were either top/mid-level managers or postsecondary teachers of science or engineering increased. Top/mid-level managers grew from 4 percent for those with 5 or less years since the degree to 18 percent for those who were more than 25 years since doctorate

[2] See Appendix E for the occupation codes and broad groupings.

award. Postsecondary teachers of science and engineering went from 23 to 36 percent of the total.

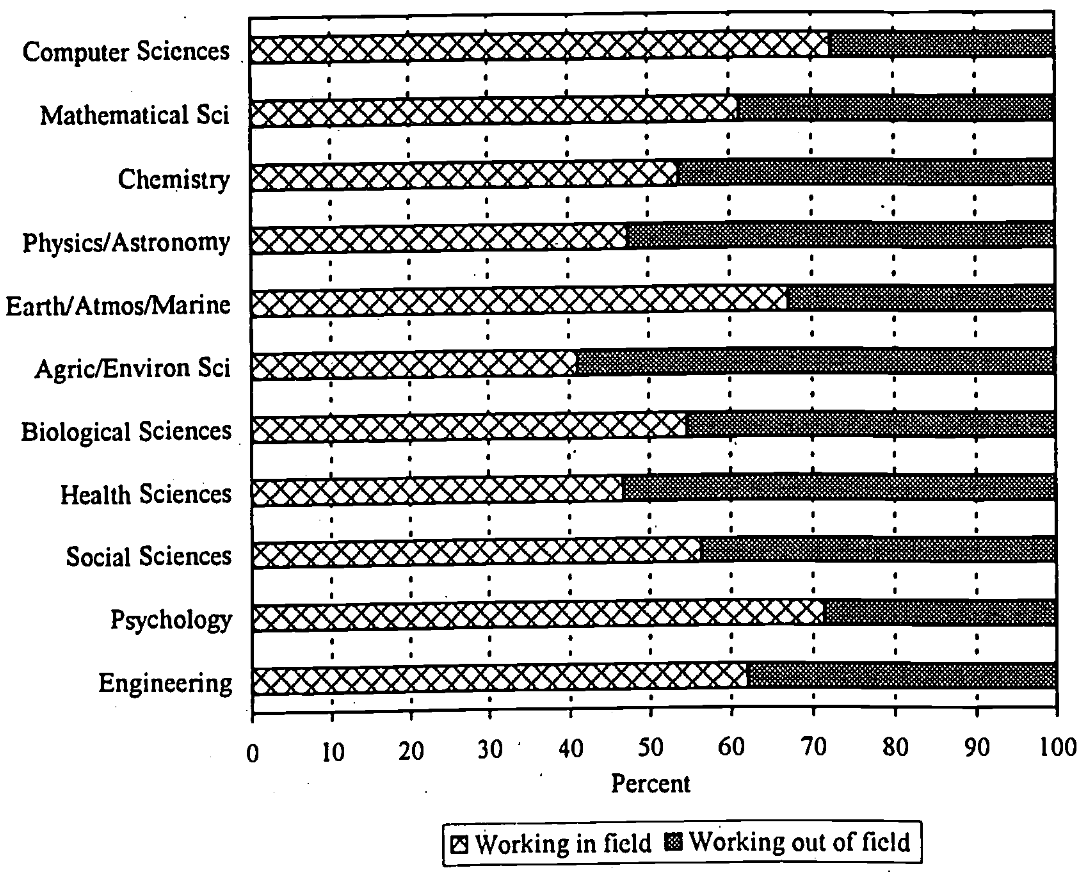
- The proportions working as scientists or engineers, on the other hand, decreased as years since doctorate increased. Of those with 5 years or less since doctorate 52 percent were scientists and 13 percent were engineers; of those more than 25 years since doctorate 33 percent were scientists and 7 percent were engineers.

Retention and Mobility

In this report, the percentage of employed individuals with degrees in a particular field that were also working as practitioners or postsecondary teachers in that specialty is called the "retention rate" of the field.

- In 1995 the retention rates ranged from highs in computer sciences and psychology, 72 and 71 percent, respectively, to a low of 41 percent for agricultural/environmental sciences doctorates (see Table 11).

FIGURE 5. Retention in field of science and engineering Ph.D.s, by field of doctorate, 1995.



Mobility between science and engineering fields was evident among certain groups of doctorates.

- Among both health and agricultural/environmental sciences doctorates, between 16 and 17 percent were employed in biological sciences. Conversely, a high proportion (14 percent) of biological sciences doctorates was employed in health sciences.

- The other fields with notable proportions working in another science/engineering specialty were mathematical sciences where 13 percent worked as computer scientists and physics/astronomy where 12 percent worked as engineers.

Primary Work Activity

As distinguished from occupation, primary work activity was defined as the activity on which the most hours were spent during a typical week on the job. In 1995, 22 percent of science and engineering doctorates listed teaching as their primary work activity. Applied research was listed by 20 percent and basic research by 14 percent. These activities were followed in frequency by professional services and managing/supervising, each at 12 percent, and development/design at 7 percent (see Table 12).

- Mathematical sciences and social sciences had the highest proportions of doctorates with teaching as their primary work activity (44 and 42 percent, respectively). These were also the fields with the highest proportions employed in educational institutions.

- Doctorates in biological sciences and earth/atmospheric/marine sciences were most likely to be engaged in applied or basic research (51 and 48 percent, respectively). Psychology Ph.D.s were least likely to be engaged primarily in research (15 percent).

- Managing/supervising as a primary work activity ranged from a high of 15 percent for health science and engineering doctorates to a low of 7 percent for computer sciences doctorates.

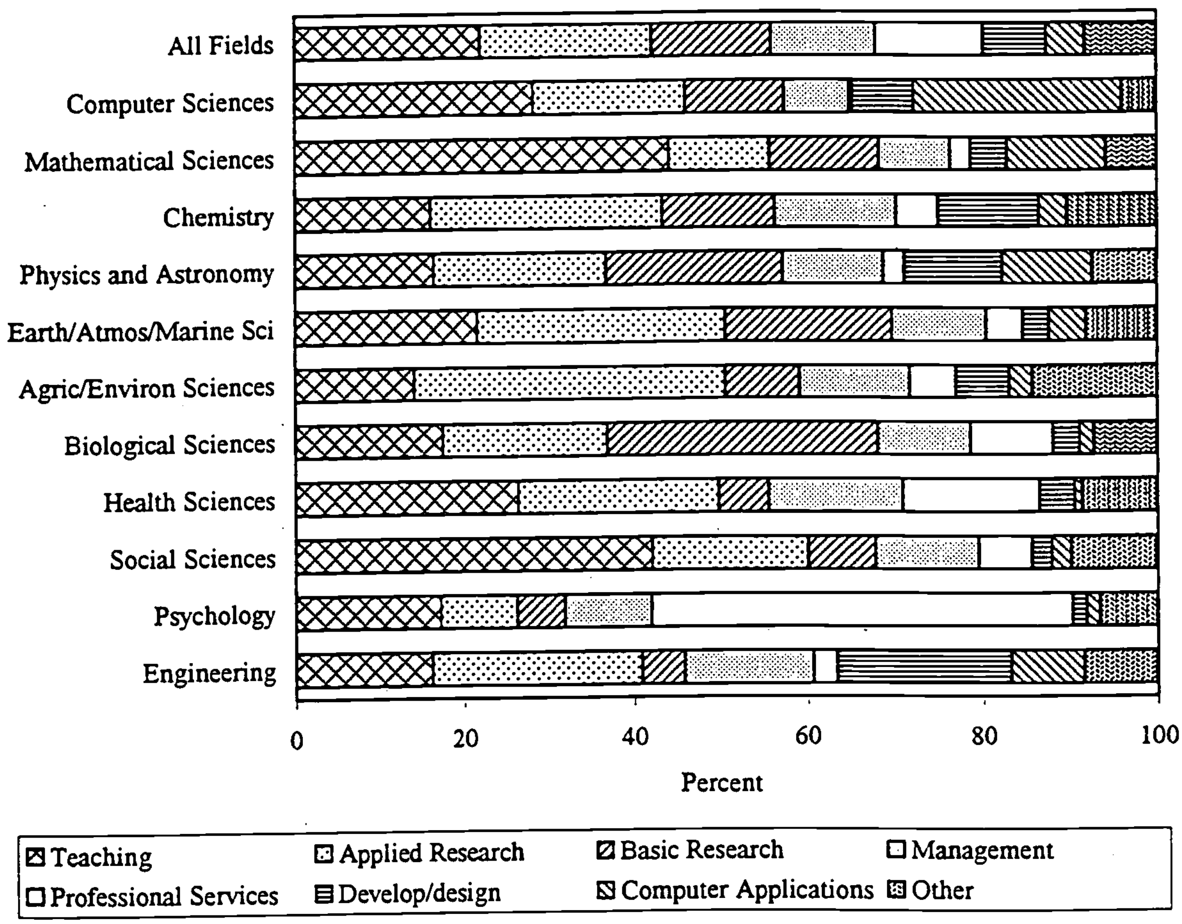
- As expected, some activities were concentrated in certain fields: 48 percent of psychology doctorates were primarily engaged in professional services; computer applications was the primary activity for 24 percent of computer sciences Ph.D.s; and 20 percent of engineers were primarily doing development/design.

- The proportion reporting applied research as the primary work activity declined as years since the doctorate increased, from 26 percent for recent Ph.D.s (those with 5 years or less since the doctorate) to 16 percent for those more than 15 years since doctorate award (see Table 13).

- On the other hand, the proportion primarily teaching grew as time since the Ph.D. increased, from 19 percent for recent Ph.D.s to 29 percent for those with more than 25 years since the degree.

- The proportion primarily engaged in managing/supervising also increased, from 4 percent of recent Ph.D.s to between 16 and 17 percent of those with more than 15 years since the degree.

FIGURE 6. Employed science and engineering Ph.D.s, by primary work activity and field, 1995.



Salary

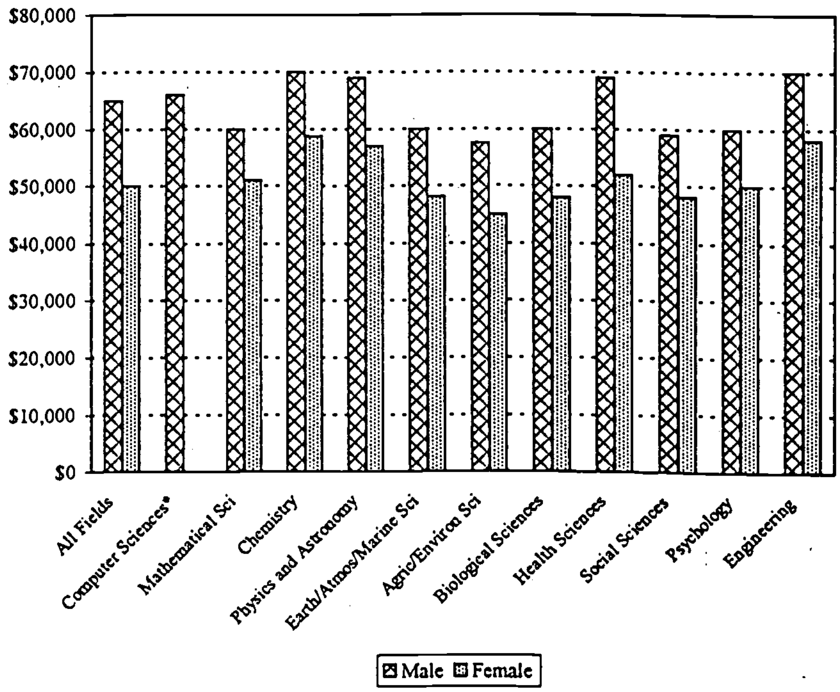
In 1995 the median salary for science and engineering Ph.D:s was $60,200. (Median annual salaries were computed for full-time employed individuals, including postdoctoral appointees.)

- By field, engineering doctorates had the highest median salaries, at $70,000, followed closely by chemistry and physics/astronomy doctorates (both $68,000). By gender, doctorates from these three fields also earned the highest median salaries, between $69,000 and $70,000 for men and between $57,000 and $58,800 for women. However, while men with doctorates in health sciences were among the top earners ($69,000), women from this field were not ($52,000) (see Table 14).

- Those working in the private for-profit sector had the highest median annual salaries, $75,000. The median annual salary for those working in educational institutions was $52,000. Within that sector, the salaries ranged from $45,000 for those in 2-year colleges to $56,000 for those working in university-affiliated research institutes (see Table 15).

- By sector, median salary differences between men and women ranged from $3,000 in elementary/secondary schools to $16,200 in university-affiliated research institutes.

FIGURE 7 Median annual salaries of science and engineering Ph.D:s, by field and gender, 1995.



*There were too few women in computer sciences to estimate the median salary.

Government Support Status

In 1995, 28 percent of employed science and engineering doctorates received support from the federal government[3] in the form of contracts or grants (see Table 16).

- Doctorates in physics/astronomy were most likely to receive government support, 47 percent, while doctorates in social sciences and psychology were least likely (18 and 16 percent, respectively).
- The agencies most frequently cited as the sources of support were the National Institutes of Health (30 percent), the Department of Defense (22 percent), and the National Science Foundation (20 percent) (see Table 17).
- By sector, the proportion receiving support was highest in private not-for-profit organizations, 44 percent, followed by educational institutions, 40 percent (see Table 18).

Relationship of Principal Job to Doctoral Degree

Science and engineering doctorates were asked about the relationship between their principal job and their doctoral field as one measure of the link between education and careers. Overall, 68 percent of science and engineering doctorates indicated that their jobs were closely related to their doctoral degrees, 24 percent said their jobs were somewhat related, and 8 percent said their jobs were not related to their degrees (see Table 19).

- Doctorates in computer sciences, psychology, and health sciences had the highest proportions reporting that their job was closely related to their doctoral education (between 79 and 81 percent).
- Doctorates in physics/astronomy most frequently reported that their jobs and education were not related (15 percent), followed by doctorates in chemistry, 11 percent.
- Of those science and engineering doctorates whose jobs were not related to their doctoral degrees, 29 percent said the most important reason for working outside their field was a change in career or professional interests. For 27 percent, "job in doctoral degree field not available" was the most important reason for working out of field, and 22 percent cited pay or promotion opportunities as the most important reason (see Table 20).

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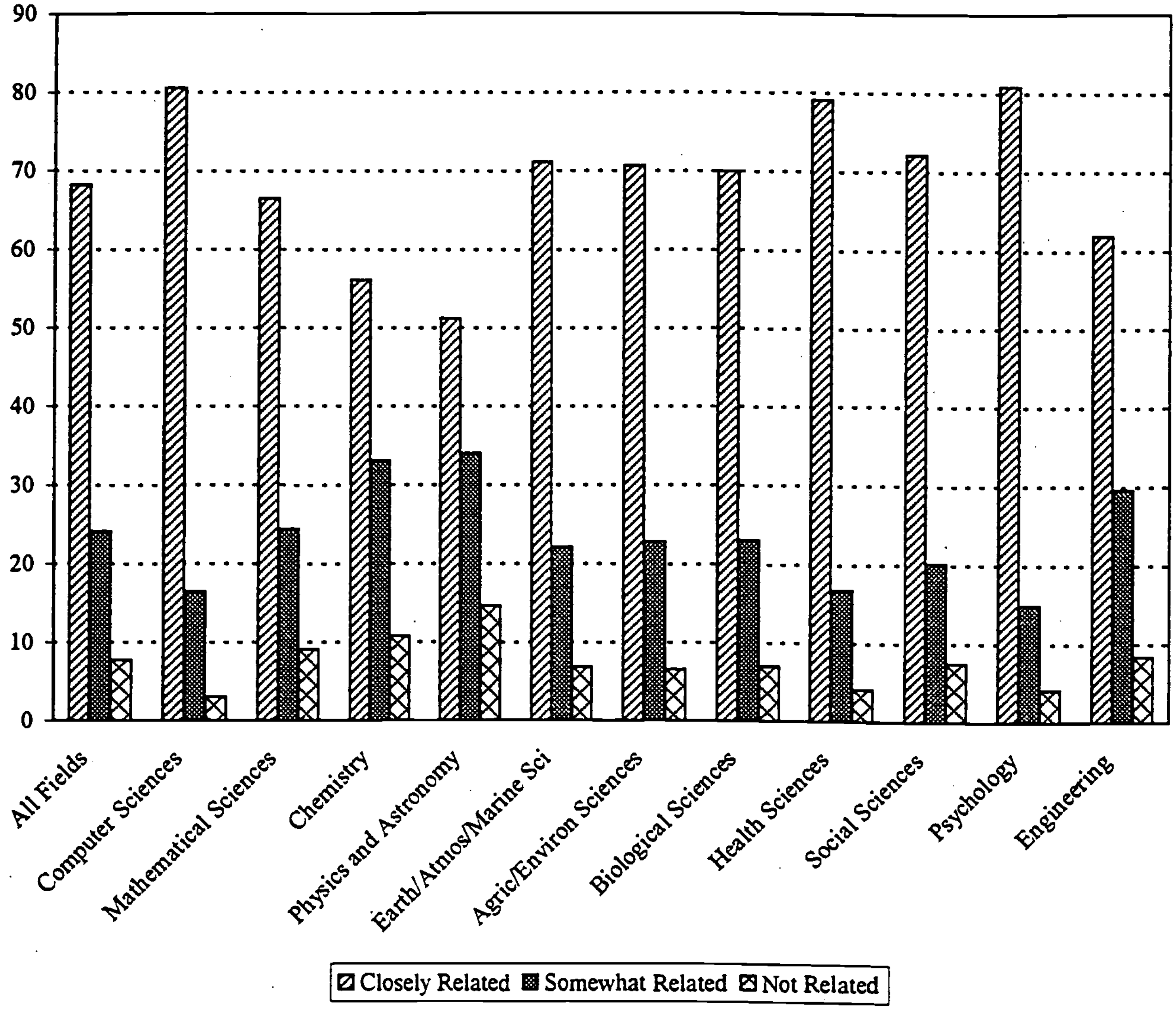
[3] Federal employees were instructed to answer "No" to this question and are therefore excluded from the proportions shown receiving support.

FIGURE 8. Science and engineering Ph.D.s, by relationship of job to doctoral field, 1995.



Focus on Academe

The following is a more detailed look at the 44 percent of employed science and engineering doctorates who were working in academe in 1995, excluding those on postdoctoral appointments.[4] (Academe includes 2-year and 4-year colleges, universities, medical schools, university-affiliated research institutes, and "other" educational institutions. It does not include elementary, middle, or secondary schools.) This section examines the rank and tenure status of scientists and engineers, how quickly they moved through the ranks, and whether this progress differed by field or gender.

Academic Rank

In 1995, 38 percent of science and engineering Ph.D.s employed in academe were full professors, 24 percent were associate professors, 20 percent were assistant professors, and 3 percent were instructors or lecturers. The remaining doctorates employed in academe were adjunct faculty members (2 percent), held some other position (2 percent), or responded that rank was not applicable to their position or at their institution (12 percent) (see Table 21).

- The highest proportion of full professors was in mathematical sciences (46 percent); the lowest was in computer sciences (10 percent). Since 95 percent of the computer sciences doctorates graduated within the past 15 years, it is not surprising that the proportion of full professors in this field was low.

- Concentrations of associate and assistant professors were highest in computer sciences (82 percent) and health sciences (62 percent) and lowest in physics/astronomy (29 percent).

- Doctorates in physics/astronomy and earth/atmospheric/marine sciences said rank was not applicable more frequently than doctorates in any other field (25 percent and 20 percent, respectively). This might be explained by the fact that higher than average proportions of Ph.D.s in these two fields were working in university-affiliated research institutions.

- Of those with 5 years or less since the Ph.D., only 2 percent were full professors and 61 percent were assistant professors. Between 6 and 15 years since the doctorate, 14 percent were full professors and 41 percent had become associate professors. After 16 to 25 years, 59 percent were full professors and after 25 years more than three-quarters (76 percent) had attained that rank (see Table 22).

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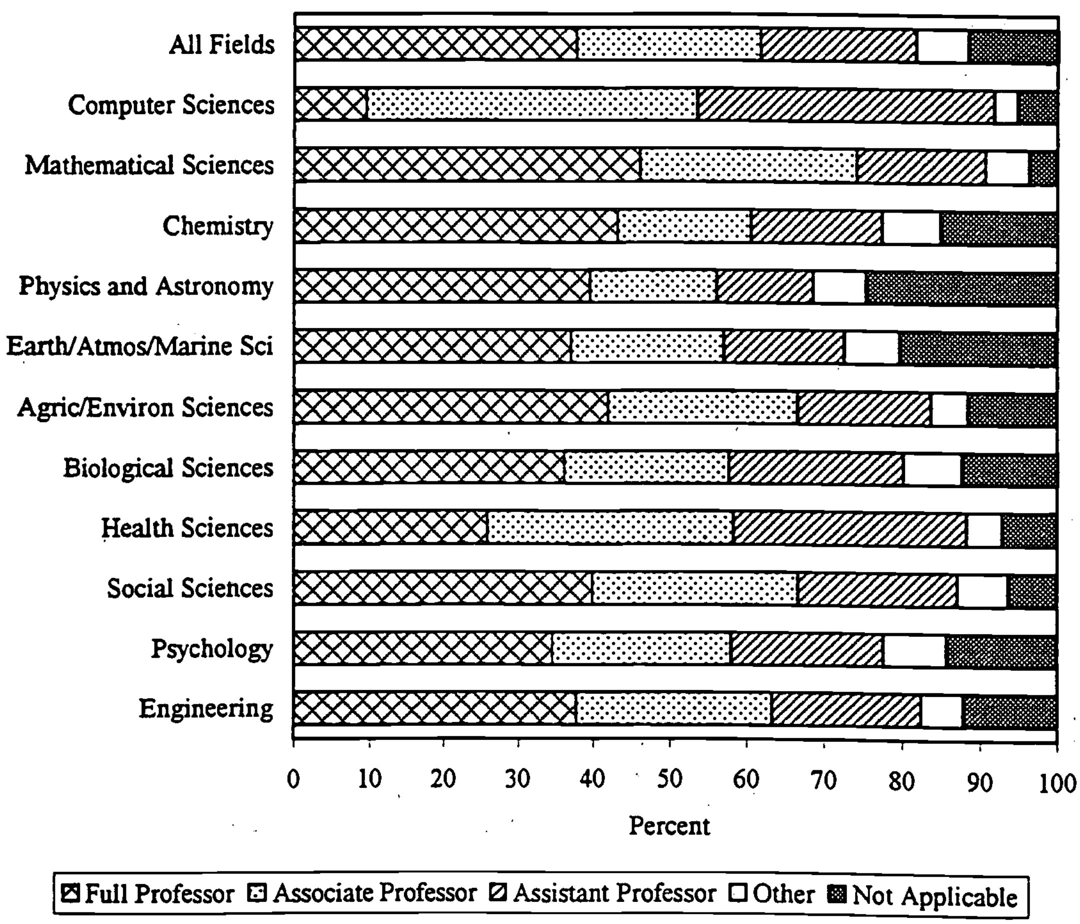
[4] Those doctorates holding postdoctoral appointments in April 1995 in the academic sector, as well as those on postdoctoral appointments in other sectors, are examined in more detail in Chapter 4.

- Women, however, did not achieve the rank of full professor in the same proportions as men. At 5 years or less since the doctorate, women actually had a slight edge in the full professor category (2 percent, compared with 1 percent for men). For the cohort 6 to 15 years since degree, the proportion of men who were full professors was nearly twice that of women (16 and 9 percent, respectively). The gap widened with time and after 25 years, only 55 percent of women were full professors compared with 78 percent of men. It should be noted that these comparisons are made by years since doctorate, rather than years in the work force. Women are likely to have more career interruptions than men, which could account for some of the observed disparities.

FIGURE 9. Faculty status of academically employed science and engineering Ph.D.s, by field, 1995.



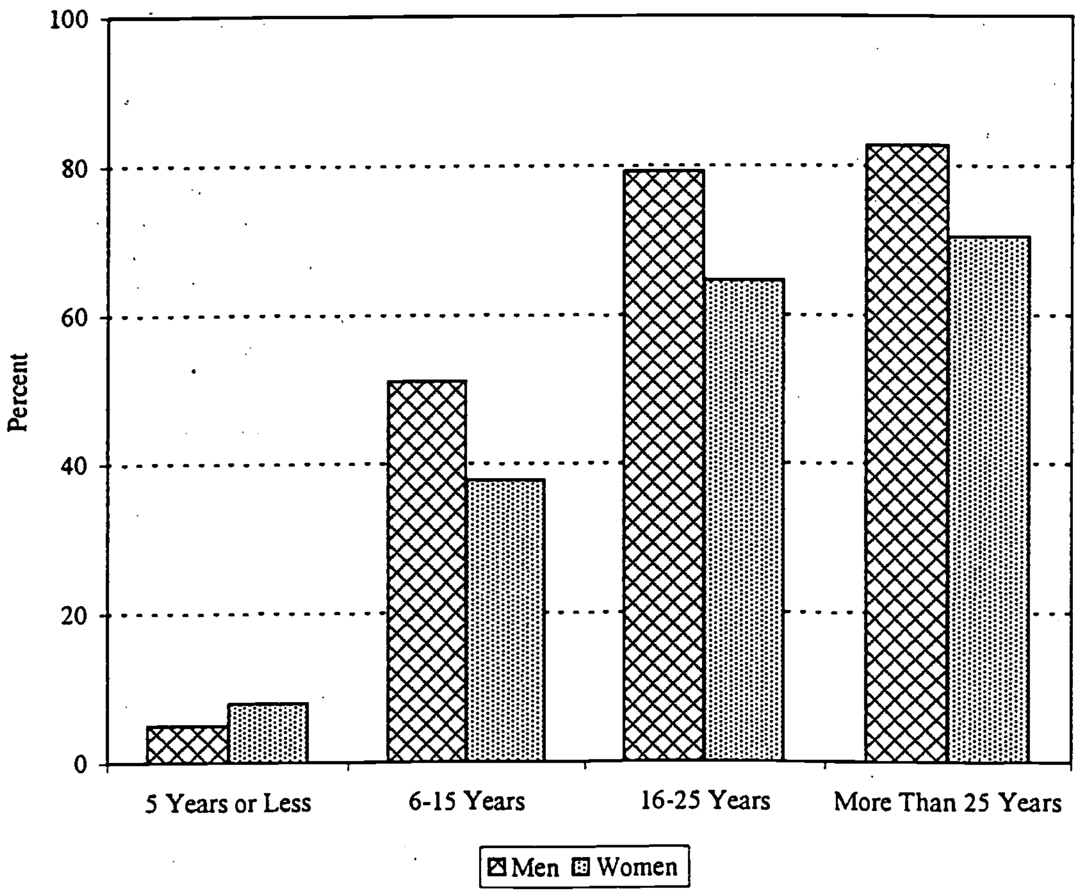
Tenure

In 1995, 56 percent of science and engineering doctorates employed in academe were tenured, 18 percent were on a tenure track, and 9 percent were not on a tenure track. Of the rest, 5 percent were at institutions without a tenure system and 13 percent were in positions to which tenure did not apply (see Table 23). As in the previous section on faculty rank, those on postdoctoral appointments were excluded from the analysis in this section.

- Mathematical sciences had the highest proportion with tenure, 72 percent, and the proportions for both agricultural/environmental sciences and social sciences were higher than average, 63 percent for each.

- While doctorates in computer sciences had the lowest proportion with tenure (42 percent), a much higher than average proportion of these doctorates were on tenure track, 45 percent compared to 18 percent overall. These figures reflect the relative youth of the doctorates in this field.

FIGURE 10. Proportion of academically employed science and engineering Ph.D.s with tenure, by time since Ph.D. and gender, 1995.



- Achievement of tenure is directly corelated with years since doctorate. At 5 years or less since the Ph.D., only 6 percent had tenure. At 6 to 15 years since the doctorate, 47 percent had tenure. By the time 16 to 25 years had passed, 77 percent had tenure, and this proportion increased to 82 percent for those with more than 25 years since the doctorate (see Table 24).

- Women with 5 years or less since the doctorate held tenure in higher proportions than men from the same cohort, 8 percent compared with 5 percent. After 5 years, however, the proportion of men with tenure was between 13 and 14 percent higher than for women in each cohort. As with faculty rank differences between men and women by cohort, the tenure rate differences may be partially explained by the tendency of women to have more gaps in their careers.

4

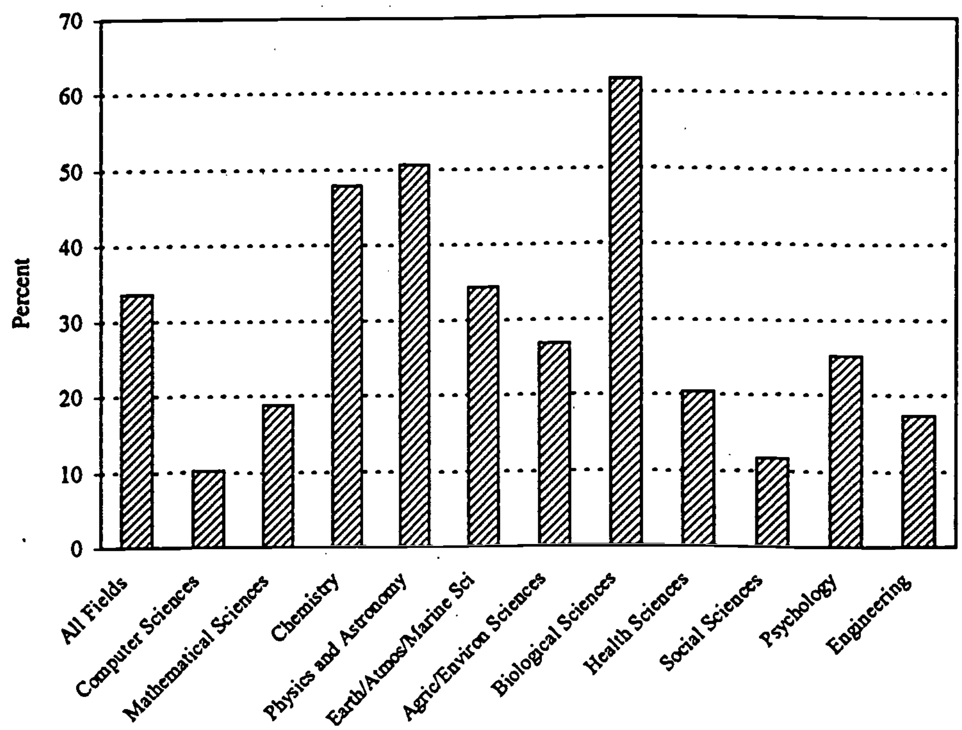
POSTDOCTORAL APPOINTMENTS

This chapter examines the postdoctoral appointment[1] (postdoc) as a component of the career of doctoral scientists and engineers. Discussed here will be the total number of postdocs held, the postdoctoral status of the population in 1995, characteristics of those on postdocs in 1995, reasons for holding postdocs, and the relevance of the postdoc to the principal job held in 1995.

Number of Postdocs

- Overall, 34 percent of science and engineering doctorates had held at least one postdoc and 9 percent had held multiple postdocs since award of the doctorate. Ph.D.s in the biological sciences were most likely to have held at least one postdoc (62 percent). Roughly half of those in chemistry and physics/astronomy also had held at least one postdoc. Least likely were doctorates in computer sciences and social sciences (10 and 12 percent, respectively). Biological sciences Ph.D.s were also most likely to have held multiple postdocs (20 percent) (see Table 25).

FIGURE 11. Proportion of science and engineering Ph.D.s having at least one postdoctoral appointment, by field, 1995.



[1] A postdoctoral appointment was defined on the survey as "a temporary position awarded in academe, industry, or government primarily for gaining additional education and training in research."

- The proportion having held at least one postdoc was inversely related to the number of years since the Ph.D. was granted, ranging from 27 percent for those more than 25 years since degree award to 40 percent for those with 5 years or less since doctorate.

- By field, the trend toward holding a postdoc was also evident. Doctorates in physics/astronomy showed the largest increase in the proportion who held a postdoc, from 36 percent of the Ph.D.s with more than 25 years since the degree to 72 percent of those 5 years or less since the doctorate. Of biological sciences Ph.D.s with more than 25 years since the doctorate, 45 percent held a postdoc; of those 5 years or less since the doctorate, 71 percent held at least one. Only doctorates in social and health sciences showed a decline in the percentage with at least one postdoc from the cohort more than 25 years since degree to the most recent 5 year cohort.

Reasons for Holding Postdocs

- Of those who had held postdocs at some time in their careers, "additional training in Ph.D. field" was most frequently cited as the primary reason for taking the first postdoc (47 percent), followed by "work with a specific person or place" (21 percent). This distribution was similar for those with only one postdoc and those who held more than one (see Table 26).

- By field among those who had ever held a postdoc, additional training was the primary reason cited most frequently (with the exception of doctorates in earth/atmospheric/marine sciences whose primary reason was most often work with a specific person).

- A higher than average proportion of doctorates in engineering and agricultural/ environmental sciences cited employment not available as the reason for their first postdoc (25 and 26 percent, respectively, compared with 11 percent for doctorates overall).

- For those doctorates with multiple postdocs, the primary reasons for the second postdoc were still most likely to be additional training and work with a specific person, but the proportions were closer, 35 and 25 percent, respectively. For those holding multiple postdocs, "other employment not available" was cited as the primary reason for the second postdoc by 14 percent (compared with 9 percent citing this reason for their first postdoc).

1995 Postdocs

- In 1995, 4 percent of science and engineering doctorates were on postdocs, with doctorates in biological sciences having the highest proportion (10 percent). The lowest proportion was in social sciences, less than 1 percent (see Table 27).

- Predictably, doctorates earning their degrees within the last 5 years had the highest proportion on postdocs, 19 percent. This proportion dropped to 2 percent for doctorates from 6 to 10 years out, and to less than 1 percent for those more than 10 years out.

- By field within the most recent 5-year cohort, 44 percent of biological sciences Ph.D.s and 39 percent of physics/astronomy Ph.D.s were on postdocs.

The next several comments in this section pertain to those science and engineering doctorates who were on postdocs in April 1995 (see Table 28[6]).

- Of those on postdocs in 1995, 85 percent were from the most recent 5-year cohort and 58 percent were less than 35 years old.

- In 1995, those on postdocs were more likely to be Asian (27 percent) and non-U.S. citizens (29 percent) than the most recent 5-year cohort of science and engineering doctorates overall (22 percent Asian and 24 percent non-U.S. citizens). The most recent 5-year cohort is used as the comparison group because most of the 1995 postdoctoral appointees were from this cohort (see above). Approximately one-third of both the postdoctoral appointees and the most recent cohort overall were female.

- Most postdoctoral appointees in 1995 were working in educational institutions (55 percent), followed by government (33 percent), business/industry (7 percent), and other sectors (5 percent). This distribution by sector was similar for postdoctoral appointees with doctorates in chemistry, physics/astronomy, and biological sciences. The exceptions were psychology, where 20 percent reported "other" sector, and engineering, with 12 percent in business/industry.

- Generally, most of those on postdocs in 1995 received health benefits (84 percent) but not pension benefits (37 percent). However, the proportions receiving these benefits varied by field. Ninety percent of physics/astronomy doctorates on postdocs received health benefits and 50 percent received pension benefits. On the other hand, only 57 percent of psychology doctorates received health benefits and 18 percent received pension benefits.

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[6] Because the proportion or the number of doctorates taking postdocs was quite low for certain fields, data for these fields are not shown separately in Table 28 or Table 29, but are included in the total column. These fields are computer, mathematical, earth/atmospheric/marine, health, and social sciences.

Relevance of Postdoc to 1995 Principal Job

Those individuals who had held a postdoc but were not on a postdoc appointment in April 1995 were asked to rate the relevance of their most recent postdoc to the work on their 1995 principal job. Table 29 shows the proportion who said the aspects of their most recent postdoc were "a great deal" or "somewhat" relevant to their job.

- "General approach or problem solving skills" was rated relevant by 90 percent of the doctorates. "Subject matter knowledge or expertise" was relevant for 85 percent, followed by "contacts established with colleagues in your field" at 80 percent and "use of specific skills or techniques" at 73 percent. "Use of specialized equipment" was considered relevant by the smallest proportion, 58 percent.

- Even for doctorates graduating more than 25 years earlier and presumably furthest removed from the postdoc experience, all aspects were considered relevant to the 1995 job by at least 50 percent.

- Even though a relatively small proportion of psychology doctorates ever held postdocs (25 percent), they rated all aspects of the postdoc (except use of equipment) relevant as or more frequently than doctorates in any of the other selected fields.

5

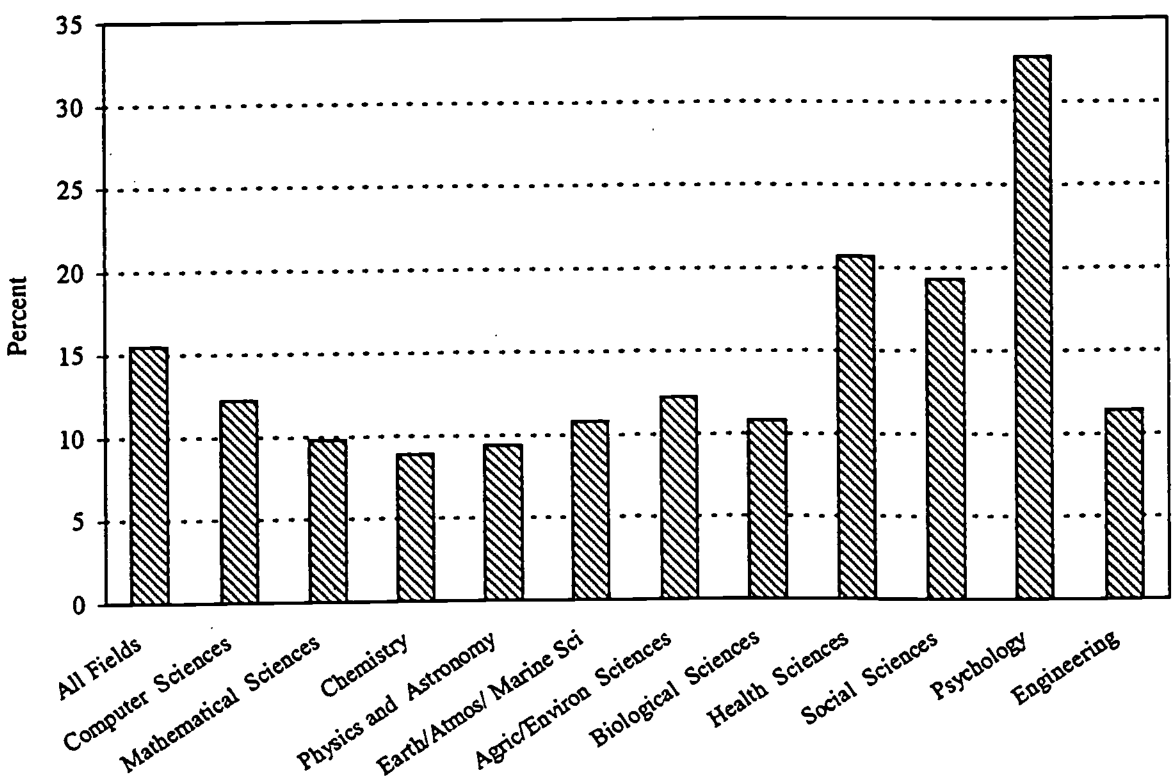
SECOND JOB

In 1995, 16 percent of science and engineering doctorates held a second job[7]. This section looks at which doctorates were likely to hold a second job and what those jobs were.

- Doctorates in psychology were most likely to hold a second job (33 percent), followed by doctorates in health and social sciences (21 and 19 percent, respectively) (see Table 30).

- The occupation of the second job was most frequently scientist (44 percent), followed by postsecondary teachers of science or engineering (20 percent). Another 19 percent were in "other" occupations which included such diverse categories as artists/broadcasters/entertainers/writers, farmers/foresters/fishermen, sales and marketing occupations, and service occupations.

FIGURE 12. Science and engineering Ph.D.s with second jobs, by field of doctorate, 1995.



[7] Holding a second job was defined on the survey as "working for pay (or profit) at a second job (or business), including part-time, evening, or weekend work."

- By field, Ph.D.s tended to hold second jobs as scientists (or engineers) in their doctoral field or as postsecondary teachers of science or engineering.

- Ph.D.s whose principal employment was in a private not-for-profit organization were most likely to hold a second job (23 percent), while those in private for-profit companies were least likely to do so (8.9 percent) (see Table 31).

- Sixty-six percent of Ph.D.s holding second jobs said those jobs were closely related to their doctoral degrees. In psychology this proportion was 82 percent. For all science and engineering doctorates with second jobs, 15 percent said the second job was not related to their doctoral degree. The field with the highest proportion saying "not related" was physics/astronomy (37 percent) (see Table 32).

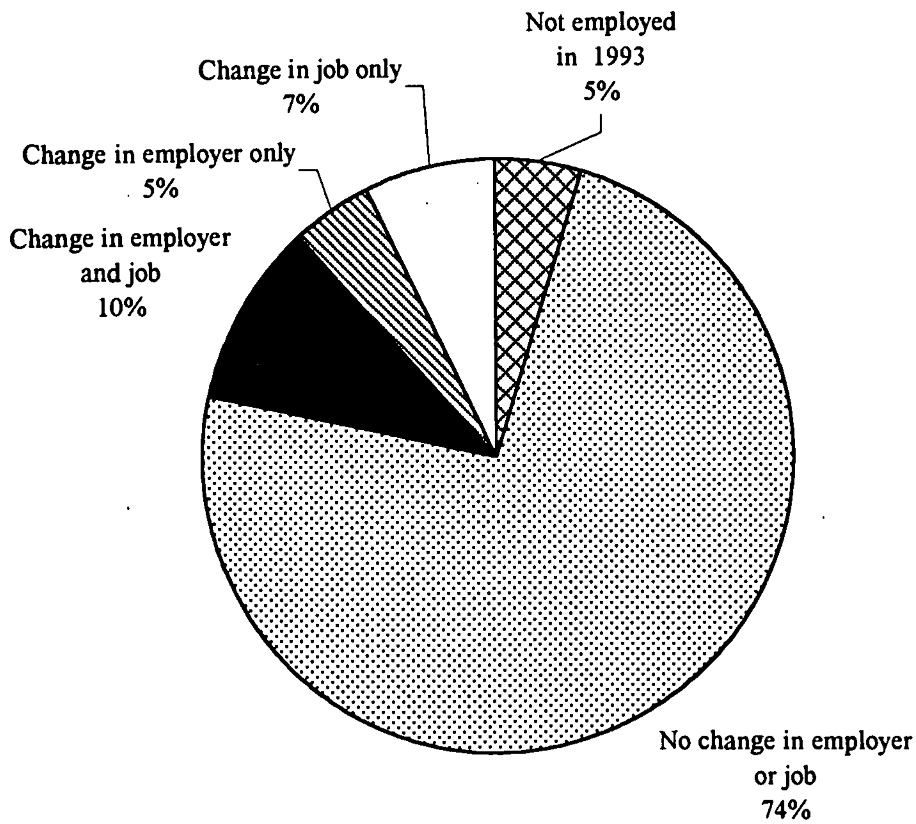
6

EMPLOYMENT CHANGES SINCE 1993

This chapter examines changes in the employment situation of science and engineering doctorates between April 1993 and April 1995, including changes in status, employer, and job. Under examination here are those science and engineering doctorates employed in April 1995. Of these, 74 percent were employed in 1993 and did not change either employer or job in the interim. Ten percent changed both employer and job, while 5 percent changed employer only and another 7 percent changed job only. Five percent reported that they were not employed in April 1993[8] (see Table 33).

- Doctorates in computer sciences were most likely to have made any type of employer and/or job change (32 percent). Change rates for all other fields were between 18 and 24 percent.

FIGURE 13. Employment changes of science and engineering Ph.D.s, from 1993 to 1995.



[8] It should be noted that approximately 33 percent of this category consisted of those still working on their Ph.D. requirements at that time.

- Computer sciences doctorates were also most likely to change both employer <u>and</u> job (19 percent), while mathematical and agricultural/environmental sciences doctorates were least likely to have done so (7 percent).

- Changes in employer ranged from 12 percent in both agricultural/environmental and social sciences to 17 percent in health sciences and 24 percent in computer sciences. (Employer changes include those doctorates who changed both employer and job and those who changed employer only.)

- Computer sciences doctorates also made job changes most frequently (27 percent). For other fields, job changes ranged from 13 percent in mathematical sciences to 20 percent for chemistry. (Job changes include those doctorates who changed both job and employer and those who changed job only.)

- The reason cited most frequently by science and engineering doctorates for changing job or employer was "pay, promotion opportunities" (52 percent). Computer, agricultural/environmental, and health sciences doctorates were more likely than those in other fields to give this reason (between 59 and 60 percent), while physics/astronomy Ph.D.s were least likely (42 percent). The second most cited reason was working conditions (28 percent) and the third was job location (21 percent) (see Table 34).

7

ARTICLES, PAPERS, AND PATENTS

Productivity of science and engineering Ph.D.s can be measured by the numbers of published articles, presented papers, and applications for patents.

Articles

- Sixty-three percent of science and engineering Ph.D.s had an article published in a refereed journal between April 1990 and April 1995. The mean number of articles published was 4.7 for all science and engineering doctorates (see Table 35).

- Publication of articles varied by field. The mean number of articles ranged from a low of 2.8 for doctorates in psychology to a high of 7.0 for doctorates in biological sciences. Ph.D.s in biological and earth/atmospheric/marine sciences were the most likely to have published at least one article (78 and 77 percent, respectively). Twenty-one percent of doctorates in biological sciences had more than 10 published articles during the five-year period compared to 12 percent for all science and engineering doctorates. The least likely to have published were psychology Ph.D.s (44 percent).

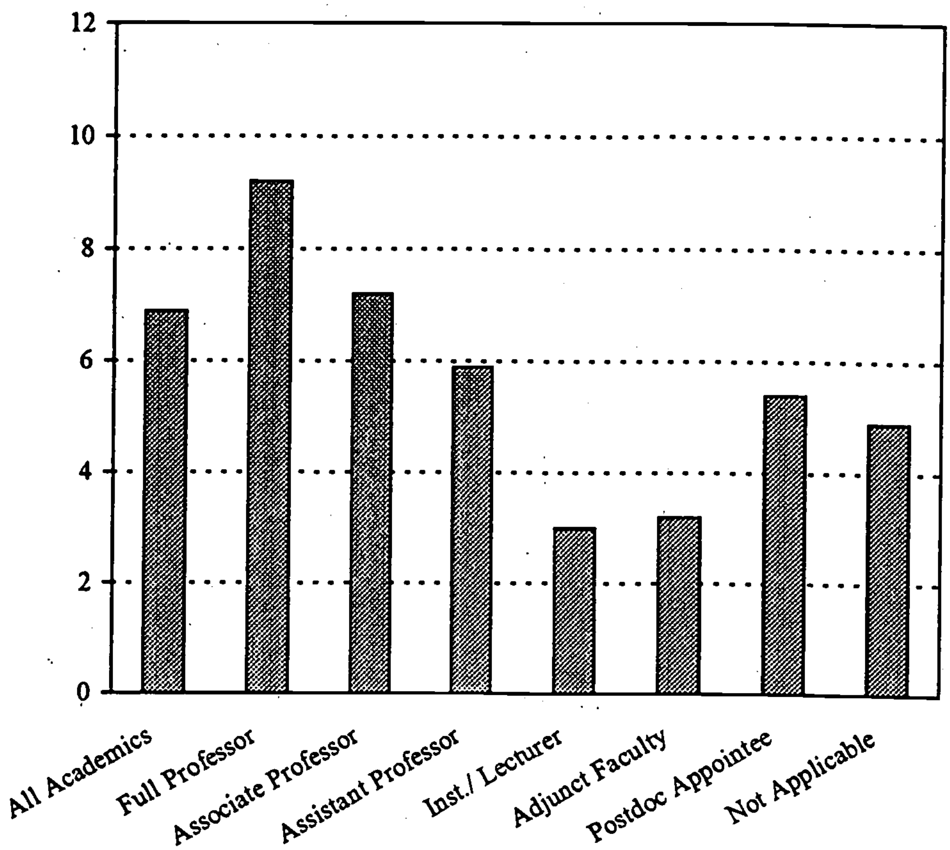
- By sector, the mean number of articles was 6.7 for science and engineering doctorates employed in educational institutions, 4.4 for those in the nonprofit sector or governmental sector, 2.4 for those in private firms, and 1.1 for the self-employed. Those most likely to have published at least one article were science and engineering doctorates in educational institutions (78 percent) and those least likely were the self-employed (28 percent).

- For all science and engineering doctorates holding academic positions, the mean number of articles published between April 1990 and April 1995 was 6.9, and 79 percent had published at least one article. Full professors had the highest mean number of published articles (9.2). More than one-quarter had published more than 10 articles. Adjunct faculty and instructors/lecturers had the lowest mean number of articles (3.2 and 3.0, respectively) (see Table 36).

- By contrast, those holding postdoctoral appointments were the most likely to have published at least one article (94 percent). About 77 percent of full professors had published at least one article, compared to 61 percent of instructor/lecturers and 58 percent of adjunct faculty.

- By tenure status, those with tenure had the highest mean number of articles published (8.2). Postdoctoral appointees, who were the most likely to have had at least one article published (94 percent), had a lower mean number of articles (5.4). Those for whom tenure was not applicable had the lowest mean number of articles (5.1) and were the least likely to have published (68 percent).

FIGURE 14. Mean number of articles published by science and engineering Ph.D.s between April 1990 and April 1995, by academic position.



Papers

- Seventy-three percent of science and engineering Ph.D.s had authored or co-authored papers for presentation at regional, national, or international conferences between April 1990 and April 1995. The mean number of papers presented was 6.4 overall (see Table 35).

- Variances in the number of papers produced for conferences by field, sector, academic position, and tenure status were similar to those in the number of articles published (see above). An exception was that doctorates in computer and earth/atmospheric/marine sciences were most likely to have authored a conference paper (86 and 85 percent, respectively).

Patents

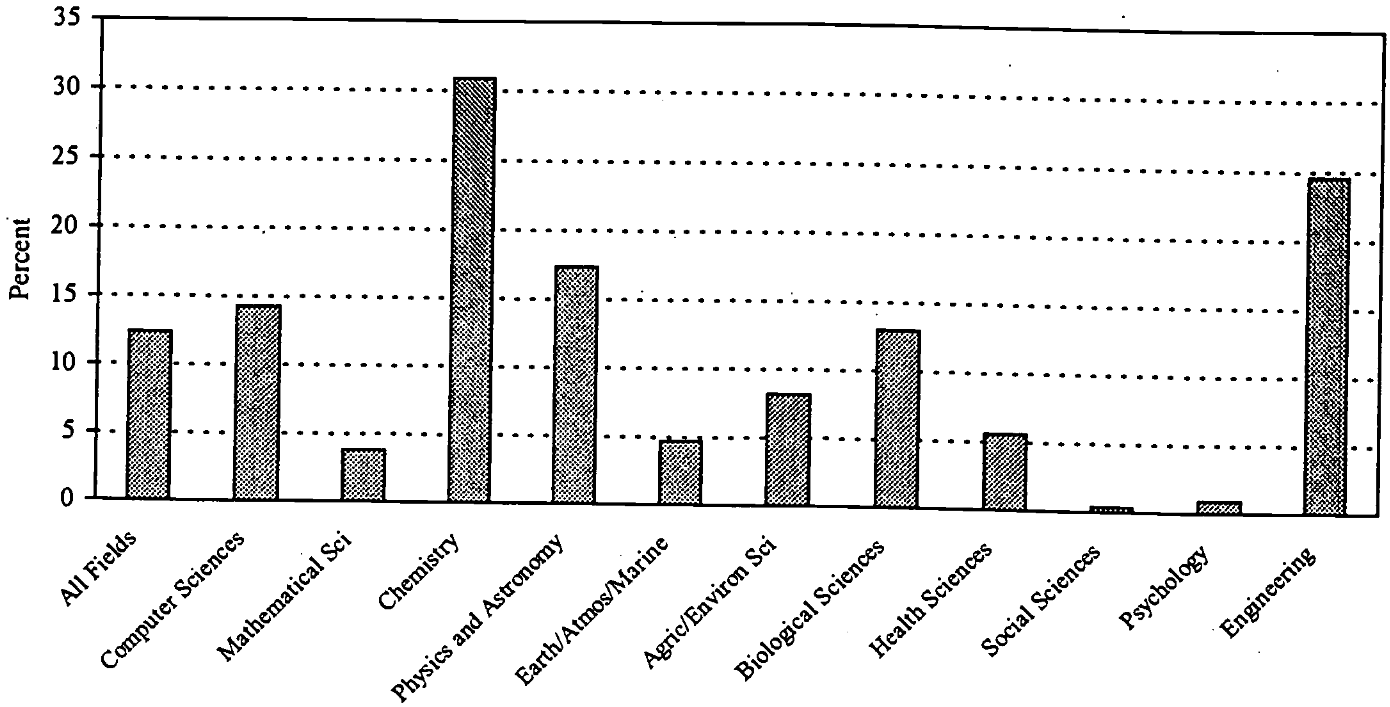
- The productivity of science and engineering doctorates can also be examined by looking at the number of patent applications on which they were named, the number of patents granted, and the number of patents that were commercialized. Overall, 12 percent said they had been named as an inventor on a patent application between April 1990 and April 1995 (see Table 37).

- The number of times science and engineering doctorates were named as an inventor on a patent varied by field. Almost no social science or psychology Ph.D.s were named as an inventor on a patent application (less than 1 percent for each). Other fields with a low percentage of doctorates named as inventor included mathematical sciences (4 percent), earth/atmospheric/marine sciences (5 percent), health sciences (6 percent), and agricultural/environmental sciences (8 percent). Those fields with a high percentage named on a patent application were chemistry (31 percent) and engineering (25 percent).

- Of those who had been named as an inventor on a patent application between April 1990 and April 1995, 59 percent had been named on 1 to 2 patent applications, 36 percent on 3 to 10 applications, and 5 percent had been named on 10 or more. However, 30 percent had no patents granted, while 46 percent had 1 to 2 granted, 21 percent had 3 to 10 granted, and 4 percent had 10 or more granted. Ph.D.s in chemistry and physics/astronomy had the highest rates of success in obtaining patents (79 and 78 percent, respectively), followed by engineering doctorates (72 percent).

- An interesting follow-on question is whether the patents granted resulted in commercialized products or processes or were licensed. Overall, 52 percent of those granted patents said that their patents had been licensed or commercialized. Thirteen percent of all those who had been granted a patent indicated that more than 2 of their patents had been commercialized or licensed.

FIGURE 15. Proportion of science and engineering Ph.D.s named as inventors on patent applications between April 1990 and April 1995, by field.



8

PROFESSIONAL DEVELOPMENT

Scientists and engineers trained at the doctorate level undertook a number of activities to further develop the skills they needed for their field, to enhance their work or research, and to interact with others with similar professional interests.

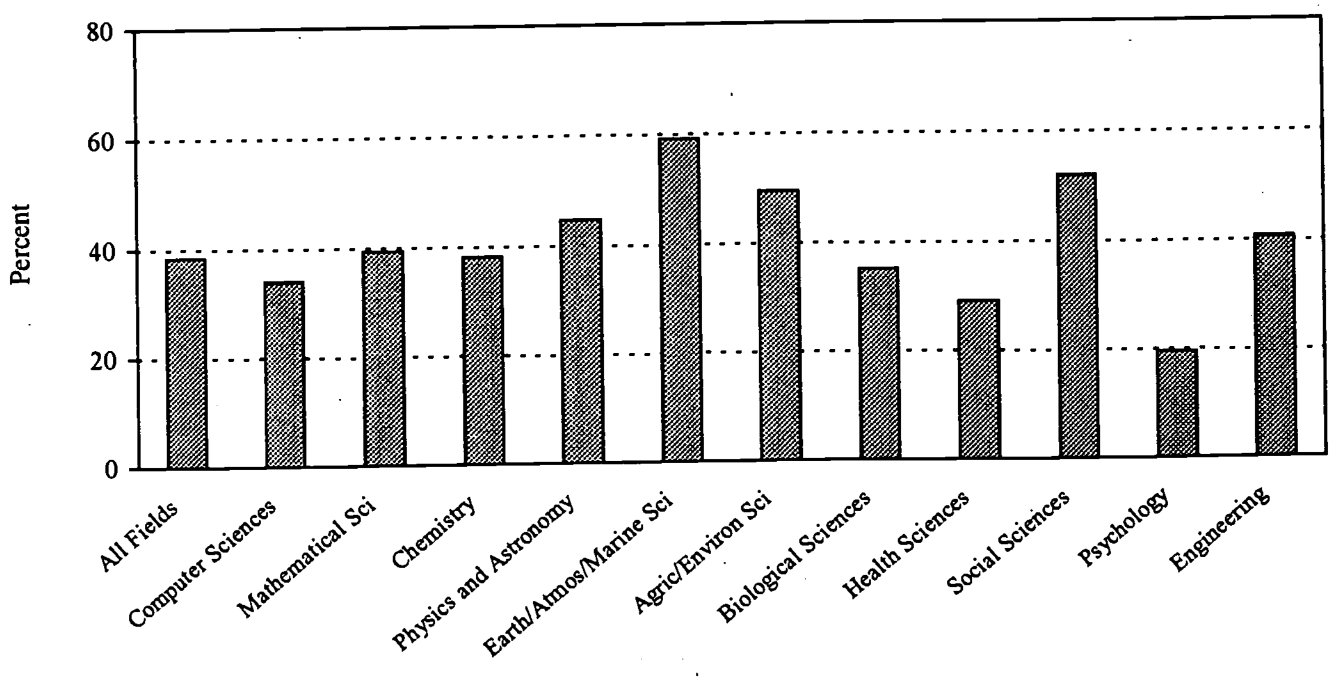
Professional Societies

- In 1995, 84 percent of all science and engineering Ph.D.s belonged to at least one professional society or association. By field, health and earth/atmospheric/marine sciences had the highest proportions (93 and 91 percent, respectively) and physics/astronomy had the lowest proportion (79 percent) (see Table 38).

Foreign Work or Research

- Since completing their doctorates, 38 percent of science and engineering Ph.D.s traveled outside the United States to work or conduct research. There was considerable variation by field. High percentages of Ph.D.s in earth/atmospheric/marine sciences (59 percent), social sciences (52 percent), and agricultural/environmental sciences (50 percent) had worked or done research outside the United States. Percentages were relatively low for health sciences (29 percent) and psychology (20 percent) (see Table 39).

FIGURE 16. Proportion of science and engineering Ph.D.s conducting work or research outside the United States since earning the doctorate, by field, 1995.



- For those who traveled outside the United States, the length of their last trip for work or research was typically one month or less: 22 percent traveled for less than a week and 43 percent for 7 to 30 days. Another 19 percent traveled for 1 to 6 months and 17 percent for more than 6 months. Biological sciences, chemistry, and physics/astronomy had the highest percentages traveling for more than 6 months (between 19 and 20 percent).

- For those not working or conducting research outside the United States, the reason most often cited (39 percent) was "not relevant to my career." Other principal reasons for not traveling were "family-related reasons" (37 percent) and "no time" (36 percent). Also about one-third said they were "unaware of funding available" for work or research outside the United States.

- The reason most often cited for not working or conducting research outside the United States varied by field. Computer science doctorates were most likely to say they had "no time" (47 percent); psychology doctorates were most likely to say it was "not relevant" (45 percent); and computer, health, and biological sciences doctorates were most likely to cite "family-related reasons" (between 41 and 42 percent).

- Only 16 percent of scientists and engineers who had not worked or conducted research outside the United States said they were deterred by a "lack of foreign language skills" or that they were "concerned about losing my place in U.S. job market."

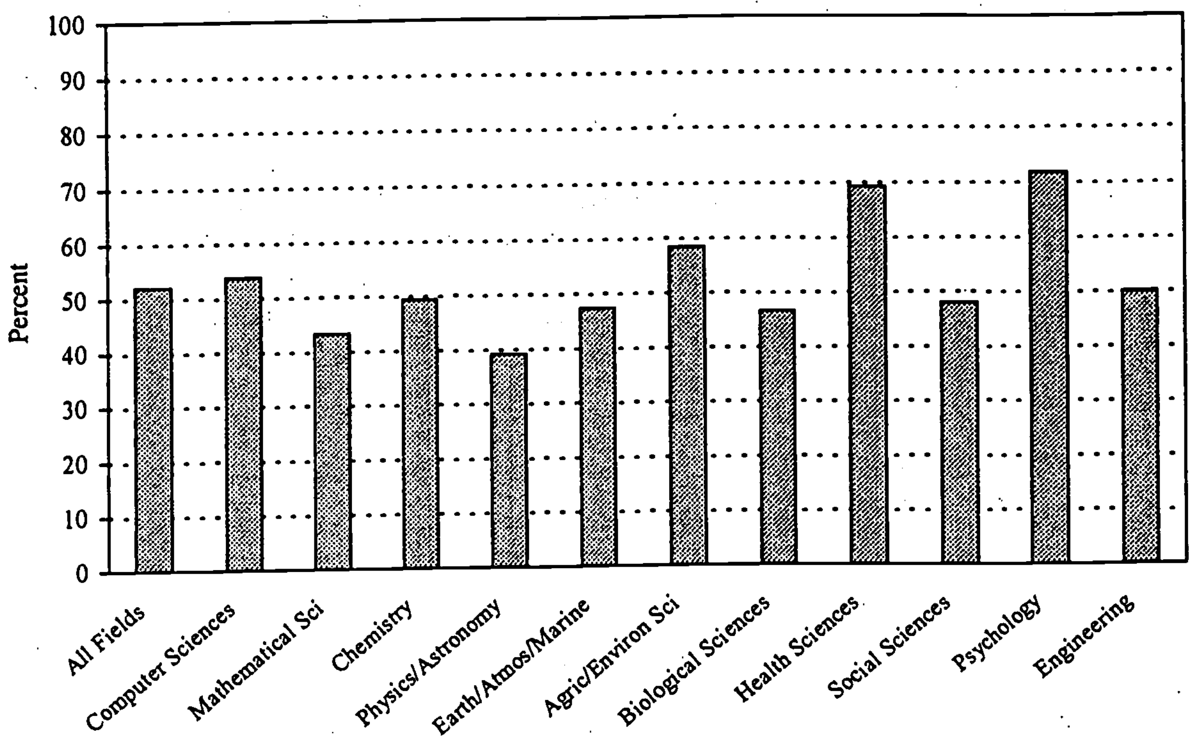
Work-Related Training

- Fifty-two percent of science and engineering doctorates attended work-related workshops, seminars, or training in the year leading up to the survey (this excludes college courses or general sessions at professional meetings). By field, participation in work-related training ranged from a low of 39 percent among Ph.D.s in physics/astronomy to a high of 72 percent among psychology doctorates (see Table 40).

- By and large, the training in which science and engineering Ph.D.s participated was technical training in their occupational field. This was true for 78 percent of all who participated in work-related training, with variations by field from a low of 70 percent in physics/astronomy to 92 percent in psychology. Approximately 28 percent of those who attended training indicated they had attended management or supervisory training, a percentage that varied from a low of 17 percent for psychology to a high of 38 percent for chemistry.

- The reason most often cited by doctorates for attending work-related training was to gain further skills or knowledge in their occupational field (92 percent). The second most frequent reason given for attending was that training was required or expected by their employers (33 percent).

FIGURE 17. Proportion of science and engineering Ph.D.s participating in work-related training between April 1994 and April 1995, by field.



Further Education

- Between April 1993 and April 1995, about 6 percent of science and engineering doctorates took college or university courses or enrolled in a college or university for other reasons, such as completing another master's degree or Ph.D. (see Table 41).

- For those who took courses or enrolled in school, the most frequently cited reason for doing so was to gain further skills (63 percent). This ranged from a low of 49 percent for mathematical sciences doctorates to highs of 77 and 80 percent for agricultural/environmental and health sciences doctorates, respectively. Personal interest was the second most frequently listed reason (52 percent). Mathematical sciences doctorates were most likely to cite this reason (64 percent).

- For 45 percent of doctorates, their employers paid the school-related costs associated with taking courses. Employers were most likely to pay the costs of courses taken by engineering Ph.D.s (55 percent) and least likely to pay the costs of courses taken by psychology Ph.D.s (34 percent).

- About 16 percent of those taking courses completed a certificate or another degree.

DETAILED STATISTICAL TABLES

TABLE 1 Distribution of Science and Engineering Ph.D.s in the United States, by Field of Doctorate, 1995

Field of Doctorate	Number	Percent
All Fields	542,500	100.0
Computer Sciences	6,600	1.2
Mathematical Sciences	25,200	4.6
Chemistry	61,400	11.3
Physics and Astronomy	38,700	7.1
Earth/Atmospheric/Marine Sciences	16,500	3.0
Agricultural/Environmental Sciences	22,400	4.1
Biological Sciences	109,900	20.3
Health Sciences	16,900	3.1
Social Sciences	75,800	14.0
Economics	22,500	4.1
Political Sciences	16,300	3.0
Sociology	23,000	4.2
Other Social Sciences	13,900	2.6
Psychology	82,200	15.1
Engineering	87,000	16.0
Aerospace/Aeronautical	3,800	0.7
Chemical	12,600	2.3
Civil	7,700	1.4
Electrical/Electronics	22,900	4.2
Industrial	2,400	0.4
Mechanical	10,600	1.9
Other Engineering	27,000	5.0

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 2 Demographic Characteristics of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

Demographic Characteristics	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
	Field of Doctorate											
Total Population (No.)	542,500	6,600	25,200	61,400	38,700	16,500	22,400	109,900	16,900	75,800	82,200	87,000
Year of Doctorate												
1942-49	0.6	0.0	0.8	2.0	0.8	0.7	0.4	0.4	0.1	0.2	0.3	0.3
1950-59	5.9	0.0	4.0	10.9	8.3	4.8	7.1	6.2	1.9	4.9	4.2	4.8
1960-69	15.0	0.0	20.6	20.2	19.8	16.6	16.0	14.5	6.6	13.5	10.9	15.7
1970-79	28.5	5.1	35.8	25.5	31.0	28.9	27.2	28.3	24.1	33.8	28.8	25.7
1980-89	30.9	43.7	24.0	26.2	24.4	29.4	32.3	31.3	37.8	31.2	36.4	30.5
1990-94	19.2	51.2	14.9	15.1	15.7	19.6	17.1	19.3	29.6	16.4	19.5	23.1
Gender												
Male	78.5	84.3	88.2	86.2	94.3	87.8	87.5	73.2	49.2	73.8	57.7	94.9
Female	21.5	15.7	11.8	13.8	5.7	12.2	12.5	26.8	50.8	26.2	42.3	5.1
Race/Ethnic Group*												
White	83.9	67.0	82.0	83.5	83.2	91.2	86.3	86.8	84.9	86.4	91.6	70.8
Black	2.0	1.2	1.4	1.5	0.8	0.4	1.3	1.8	4.3	3.6	3.1	1.3
Asian	11.5	28.7	13.4	12.6	14.2	6.6	10.1	9.3	8.0	6.8	2.0	25.6
Native American	2.2	2.8	3.0	2.1	1.5	1.5	2.1	1.9	2.0	2.6	2.6	2.1
Hispanic	0.4	0.2	0.2	0.3	0.1	0.4	0.3	0.3	0.8	0.6	0.6	0.2
Age in 1995												
34 or Younger	11.4	27.6	10.0	13.6	13.3	10.5	7.2	12.4	5.9	6.3	8.3	16.8
35-44	30.9	53.7	24.7	27.7	24.7	31.3	33.2	33.8	35.2	26.6	33.5	32.0
45-54	32.6	17.4	40.2	27.9	33.0	31.9	30.7	30.8	37.3	38.2	37.1	27.3
55-64	16.0	1.1	18.9	18.4	18.7	17.3	17.8	14.0	14.9	17.9	13.6	16.2
65-75	9.1	0.3	6.2	12.4	10.3	8.9	11.2	8.9	6.7	11.0	7.5	7.6
Citizenship												
U.S. Citizen	92.1	71.7	89.2	93.4	90.4	93.5	93.0	93.9	94.9	93.3	98.2	84.5
Non-U.S. Citizen	7.9	28.3	10.8	6.6	9.6	6.5	7.0	6.1	5.1	6.7	1.8	15.5

* Regardless of citizenship status.
NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 3 Demographic Characteristics of Science and Engineering Ph.D.s, by Years Since Doctorate, 1995 (in percent)

Demographic Characteristics	Total	Years Since Doctorate: 5 Years or Less	6-15 Years	16-25 Years	More Than 25 Years
Total Population (No.)	542,500	104,200	167,400	154,600	116,300
Gender					
Male	78.5	65.8	71.9	83.7	92.5
Female	21.5	34.2	28.1	16.3	7.5
Race/Ethnic Group*					
White	83.9	71.4	83.1	86.8	92.3
Black	2.0	2.9	2.4	2.0	0.8
Asian	11.5	21.6	11.8	8.9	5.5
Native American	2.2	3.6	2.4	1.9	1.0
Hispanic	0.4	0.3	0.3	0.5	0.3
Citizenship					
U.S. Citizen	92.1	75.7	92.6	97.8	98.7
Non-U.S. Citizen	7.9	24.3	7.4	2.2	1.3

* Regardless of citizenship status.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 4 Employment Status of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Employment Status	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)	542,500	6,600	25,200	61,400	38,700	16,500	22,400	109,900	16,900	75,800	82,200	87,000
Full-Time Employed*	84.1	96.5	86.3	81.7	84.9	83.2	82.2	84.7	85.9	83.6	80.5	87.4
Part-Time Employed*	5.2	1.4	4.4	4.0	3.9	3.9	3.9	3.8	5.5	5.6	11.8	3.0
Not Employed**	10.6	2.1	9.3	14.4	11.1	12.9	13.9	11.4	8.6	10.8	7.7	9.6
Seeking Employment	1.4	0.9	1.6	1.9	1.4	1.7	1.5	1.5	1.4	1.0	0.6	1.6
Retired	7.5	0.0	6.5	10.8	8.2	9.3	11.1	7.2	5.6	8.0	4.9	7.0
Not Seeking Employment	1.8	1.3	1.3	1.7	1.6	1.8	1.3	2.7	1.6	1.8	2.3	0.9

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Includes those who held postdoctoral appointments.
**Percentages are not unemployment rates because they are based on the total population, which includes those retired and those not seeking employment; none of these is considered part of the labor force in this report. Unemployment rates are shown in Table 7.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 5 Reasons for Not Working as Reported by Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Reasons for Not Working	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Not Employed (No.)	57,800	*	2,300	8,800	4,300	2,100	3,100	12,600	1,500	8,200	6,300	8,400
Retired	72.3	*	73.0	78.8	76.5	73.2	80.7	65.1	65.6	75.3	64.3	75.9
On Layoff	5.9	*	8.0	6.6	6.1	8.0	4.9	6.2	8.4	3.0	1.8	9.4
Student	2.8	*	1.4	0.7	2.2	4.3	1.6	4.7	3.0	2.1	5.4	1.9
Family Responsibilities	6.6	*	6.6	4.8	2.8	7.8	3.6	9.7	8.2	4.8	13.7	2.5
Ill/Disabled	5.1	*	5.1	3.5	5.1	3.3	2.0	6.5	6.3	6.1	9.2	2.2
Suitable Job Not Available	10.3	*	13.1	9.0	12.0	12.3	6.6	10.0	10.9	9.8	10.0	11.1
No Need or Desire to Work	8.8	*	14.5	8.3	10.0	11.1	6.7	9.0	13.8	7.4	13.2	4.1
Other Reason	6.8	*	5.4	4.1	8.5	7.9	8.7	8.3	5.7	4.8	6.5	7.9

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total. Percentages may total more than 100 because multiple answers were allowed.

57 *Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 6 Reasons for Working Part-Time as Reported by Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Reasons for Working Part-Time	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Employed Part-Time (No.)	27,700	*	*	2,400	1,500	*	*	4,000	*	4,200	9,500	2,500
Retired or Semi-Retired	32.8	*	*	50.3	51.6	*	*	40.7	*	31.3	19.0	41.3
Student	1.7	*	*	2.0	0.0	*	*	4.4	*	1.9	0.9	0.6
Family Responsibilities	25.1	*	*	6.9	8.2	*	*	23.8	*	21.6	40.3	9.3
Ill/Disabled	2.1	*	*	0.3	0.0	*	*	1.1	*	2.4	3.6	1.3
Suitable Job Not Available	22.3	*	*	28.5	34.6	*	*	21.5	*	26.3	15.5	31.5
No Need or Desire for Full-Time Work	35.7	*	*	31.1	28.4	*	*	30.3	*	27.9	42.6	33.5
Other Reason	13.3	*	*	12.2	9.3	*	*	12.6	*	17.8	12.4	10.2

NOTE: Percentages may total more than 100 because multiple answers were allowed.

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 7 Labor Force Status of Science and Engineering Ph.D.s, by Field of Doctorate and Gender, 1995 (in percent)

Labor Force Status and Gender	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Ph.D. Labor Force (No.)	492,100	6,500	23,200	53,700	35,000	14,600	19,700	99,000	15,700	68,300	76,300	80,100
Full-Time Employed*	92.8	97.7	93.5	93.3	94.1	93.6	93.8	94.1	92.6	92.8	86.7	95.0
Part-Time Employed*	5.8	1.4	4.8	4.5	4.4	4.4	4.5	4.3	5.9	6.2	12.7	3.2
Unemployed and Seeking	1.5	0.9	1.7	2.2	1.6	2.0	1.7	1.7	1.5	1.1	0.6	1.8
Male	385,200	5,500	20,500	46,200	33,000	12,800	17,100	72,500	7,700	50,100	44,000	75,800
Full-Time Employed*	94.5	98.1	94.7	93.5	94.3	94.1	94.4	95.3	94.0	94.0	92.7	95.4
Part-Time Employed*	4.1	1.0	3.5	4.3	4.2	3.8	4.0	3.2	4.2	5.0	6.6	3.0
Unemployed and Seeking	1.5	0.9	1.7	2.2	1.4	2.1	1.6	1.6	1.8	1.0	0.7	1.6
Female	106,900	**	2,700	7,500	2,000	1,800	2,600	26,500	8,100	18,200	32,300	4,200
Full-Time Employed *	86.6	**	84.5	92.0	89.4	90.1	89.9	90.8	91.2	89.3	78.5	87.8
Part-Time Employed*	11.8	**	14.1	5.8	6.9	8.6	7.7	7.3	7.5	9.3	20.9	7.5
Unemployed and Seeking	1.5	**	1.4	2.2	3.7	1.2	2.4	1.9	1.3	1.4	0.6	4.7

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Includes those who held postdoctoral appointments.
**Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 8 Employment Sector of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Employment Sector	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physcis and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Educational Institution	48.5	50.2	67.0	33.1	47.7	47.7	47.1	58.8	56.2	65.7	39.8	33.1
2-Year College	1.4	0.6	2.0	1.9	1.2	1.4	1.3	1.6	1.3	2.2	1.4	0.3
4-Year College/University	41.2	45.5	59.3	26.0	34.5	36.8	39.2	52.3	50.7	58.8	33.1	27.3
University-Affiliated Research Institute	4.7	3.6	5.0	4.4	11.2	8.9	6.0	4.2	3.1	4.0	1.5	5.3
Elementary or Secondary School	1.1	0.5	0.7	0.8	0.8	0.6	0.4	0.7	1.1	0.8	3.9	0.1
Private For-Profit Company	30.3	43.2	22.6	55.2	33.5	22.5	30.1	22.3	21.2	10.9	19.1	53.8
Self-Employed	5.9	1.3	2.1	2.7	2.8	3.8	4.4	3.1	3.6	4.6	20.0	3.1
Private Not-for-Profit Organization	4.9	2.0	3.3	2.9	5.6	4.8	2.3	4.9	7.4	5.0	9.1	2.9
State/Local Government	2.7	0.7	0.5	1.0	0.5	3.0	2.9	2.3	4.0	4.0	7.0	0.8
U.S. Government	7.1	2.2	4.2	4.7	9.7	17.9	12.9	8.4	7.0	7.4	4.8	6.1
Other Employer	0.6	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.6	2.4	0.3	0.2

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 9 Occupation of Science and Engineering Ph.D.s, by Sector, 1995 (in percent)

		Employment Sector					
Occupation	Total	Educational Institution	Private For-Profit Company	Self-Employed	Private Not-for-Profit Organization	Government	Other Employer
Employed Population (No.)	484,800	234,900	146,700	28,600	23,800	48,000	2,700
Scientists	38.3	24.6	44.1	67.8	57.5	59.3	58.9
Computer Scientists	2.9	0.6	7.3	1.9	2.9	1.5	1.5
Math Scientists	1.2	0.6	1.6	0.8	2.8	2.7	1.8
Chemists	4.4	1.2	10.6	1.6	2.2	3.7	3.4
Physicists	2.5	2.2	2.3	1.0	4.1	4.7	0.7
Earth/Atmospheric/Marine Scientists	2.1	1.4	2.2	1.5	2.7	5.8	0.6
Agricultural/Environmental Scientists	1.8	1.5	1.8	1.6	0.9	3.7	1.6
Biological Scientists	9.8	10.4	8.0	2.7	13.4	15.3	4.1
Health Scientists	2.6	2.0	2.4	6.1	5.0	3.1	5.4
Social Scientists	2.4	1.5	1.5	2.9	4.5	6.5	3.4
Psychologists	8.5	3.1	6.5	47.7	19.0	12.3	5.7
Engineers	8.8	2.4	20.5	6.1	5.9	8.1	6.0
Postsecondary Teachers of Science	24.8	51.0	0.0	0.1	0.2	0.1	0.0
Postsecondary Teachers of Engineering	3.2	6.6	0.0	0.0	0.0	0.0	0.0
Other Teachers/Professors	2.3	4.6	0.0	0.2	0.0	0.1	0.0
Top/Mid-Level Managers	12.7	8.0	19.3	1.9	20.5	17.7	21.0
Management-Related Occupations	4.6	1.6	7.6	4.9	6.8	8.4	10.2
Technologists	1.2	0.4	2.6	1.4	0.9	1.3	1.4
Other Occupations	4.1	0.9	5.8	17.6	8.2	4.9	2.5

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 10 Occupation of Science and Engineering Ph.D.s, by Years Since Doctorate, 1995 (in percent)

		Years Since Doctorate			
Occupation	Total	5 Years or Less	6-15 Years	16-25 Years	More Than 25 Years
Employed Population (No.)	484,800	100,200	161,100	145,400	78,100
Scientists	38.3	51.7	41.5	29.7	33.2
Computer Scientists	2.9	4.0	3.1	2.8	1.4
Math Scientists	1.2	1.7	1.4	1.0	0.8
Chemists	4.4	5.7	4.6	3.3	4.2
Physicists	2.5	3.4	2.4	2.0	2.5
Earth/Atmospheric/Marine Scientists	2.1	2.5	2.0	2.2	2.0
Agricultural/Environmental Scientists	1.8	1.9	2.0	1.3	1.8
Biological Scientists	9.8	16.6	10.5	6.7	5.6
Health Scientists	2.6	2.9	2.7	2.8	1.9
Social Scientists	2.4	2.9	2.7	2.0	1.8
Psychologists	8.5	10.0	10.1	7.4	5.0
Engineers	8.8	12.6	9.0	7.2	6.8
Postsecondary Teachers of Science	24.8	20.4	23.6	25.5	31.4
Postsecondary Teachers of Engineering	3.2	2.9	3.3	2.7	4.2
Other Teachers/Professors	2.3	1.8	2.4	2.5	2.0
Top/Mid-Level Managers	12.7	3.7	10.4	18.7	17.9
Management-Related Occupations	4.6	2.4	5.0	5.7	4.6
Technologists	1.2	1.5	1.4	1.2	0.8
Other Occupations	4.1	3.0	3.5	5.0	5.3

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 11 Occupation of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

Occupation	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Practitioners and Postsecondary Teachers of Science & Engineering												
Computer Scientists	3.9	72.4	13.3	1.7	5.5	1.5	0.8	0.8	0.3	1.6	1.1	6.5
Mathematical Scientists	3.9	1.1	61.2	0.2	1.8	0.7	1.0	1.0	0.3	1.6	0.6	1.4
Chemists	6.6	0.0	0.3	53.8	0.6	1.4	2.7	1.5	2.3	0.1	0.1	0.8
Physicists	4.0	0.0	0.5	1.7	47.5	1.7	0.1	0.3	0.6	0.0	0.0	1.5
Earth/Atmospheric/Marine Scientists	3.2	0.0	0.1	1.5	5.9	67.1	3.9	0.7	0.4	1.1	0.0	1.1
Agricultural/Environmental Scientists	2.5	0.0	0.0	0.4	0.0	0.1	41.0	3.4	0.3	0.5	0.0	0.2
Biological Scientists	13.8	0.8	0.3	6.5	1.9	5.0	17.2	54.7	16.3	0.5	1.9	1.1
Health Scientists	5.6	0.8	0.5	2.1	1.3	0.3	2.9	13.9	46.8	2.2	2.6	1.0
Social Scientists	8.3	0.6	0.2	0.0	0.3	0.4	1.3	0.1	2.1	56.4	1.1	0.2
Psychologists	11.4	0.3	0.1	0.1	0.1	0.1	0.0	0.3	1.6	1.1	71.3	0.0
Engineers	12.1	2.8	3.9	4.2	12.0	3.8	2.1	0.7	0.8	0.2	0.6	62.0
Other Teachers/Professors	2.3	3.8	2.1	0.9	1.0	1.0	0.9	1.0	1.7	8.2	2.4	0.7
Top/Mid-Level Managers	12.7	8.9	9.1	15.4	11.1	9.8	13.0	11.9	17.2	13.3	9.7	15.9
Management-Related Occupations	4.6	2.7	3.2	5.0	4.1	3.4	4.7	4.5	5.9	5.7	4.3	4.5
Technologists	1.2	4.5	2.5	1.7	3.2	1.0	1.6	1.1	0.5	0.4	0.3	1.3
Other Occupations	4.1	1.3	2.6	4.8	3.7	2.8	6.8	4.2	2.8	7.1	3.9	2.0

Note: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 12 Primary Work Activity of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Primary Work Activity	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Applied Research	20.2	17.8	11.6	27.4	20.5	29.0	36.5	19.6	23.4	18.0	9.2	24.8
Basic Research	13.7	11.4	12.4	13.0	20.4	19.0	8.6	31.0	5.8	7.6	5.6	4.9
Development and Design	7.2	6.9	4.2	11.6	11.2	2.9	6.1	3.1	4.1	2.3	1.6	19.9
Computer Applications	4.4	23.9	11.3	3.2	10.3	4.3	2.6	1.5	0.8	2.2	1.5	8.3
Managing and Supervising	11.8	7.4	8.1	13.7	11.3	10.8	12.4	10.5	15.2	11.8	10.1	14.9
Professional Services	12.3	0.3	2.3	4.7	2.4	4.2	5.3	9.5	15.6	6.0	48.2	2.6
Teaching	22.1	28.3	44.2	16.0	16.4	21.6	14.1	17.4	26.4	42.1	17.1	16.1
Other Activities	8.4	4.0	6.0	10.5	7.5	8.2	14.5	7.4	8.7	9.9	6.7	8.4

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 13 Primary Work Activity of Science and Engineering Ph.D.s, by Years Since Doctorate, 1995 (in percent)

		Years Since Doctorate			
Primary Work Activity	Total	5 Years or Less	6-15 Years	16-25 Years	More Than 25 Years
Employed Population (No.)	484,800	100,200	161,100	145,400	78,100
Applied Research	20.2	25.8	22.3	16.4	15.5
Basic Research	13.7	19.9	14.4	9.5	11.9
Development and Design	7.2	8.1	7.3	7.4	5.5
Computer Applications	4.4	5.3	4.7	4.1	2.8
Management and Administration	11.8	4.0	10.3	16.9	15.6
Professional Services	12.3	12.5	13.9	12.2	9.1
Teaching	22.1	18.8	19.5	23.7	28.5
Other Activities	8.4	5.6	7.7	9.7	11.0

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 14 Median Annual Salaries of Science and Engineering Ph.D.s, by Field of Doctorate and Gender, 1995

	Field of Doctorate											
Gender	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total	$60,200	$65,000	$60,000	$68,000	$68,000	$60,000	$55,000	$57,400	$58,000	$55,000	$56,000	$70,000
Male	65,000	66,000	60,000	70,000	69,000	60,000	58,500	60,000	69,000	59,000	60,000	70,000
Female	50,000	*	51,000	58,800	57,000	46,100	45,000	48,000	52,000	48,100	50,000	58,200

NOTE: Median salaries were computed only for Ph.D.s employed full-time (including postdoctoral appointees).

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 15 Median Annual Salaries of Science and Engineering Ph.D.s, by Employment Sector and Gender, 1995

Employment Sector	Total	Male	Female
Total	$60,200	$65,000	$50,000
Educational Institution	52,000	55,000	44,000
2-Year College	45,000	47,000	40,000
4-Year College/University	52,000	55,000	44,000
University-Affiliated Research Institute	56,000	60,200	44,000
Elementary or Secondary School	46,000	48,000	45,000
Private For-Profit Company	75,000	75,000	64,500
Self-Employed	70,000	72,000	61,000
Private Not-for-Profit Organization	60,000	64,000	50,000
Government	61,000	63,000	54,900

NOTE: Median salaries were computed only for Ph.D.s employed full-time (including postdoctoral appointees).

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 16 Government Support Status of Employed Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Government Support Status	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Received Government Support	28.3	31.1	24.0	21.7	47.2	38.9	27.7	37.3	24.1	17.5	16.3	34.0
No Government Support	71.7	68.9	76.0	78.3	52.8	61.1	72.3	62.7	75.9	82.5	83.7	66.0

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 17 Federal Agencies and Departments Supporting Work of Science and Engineering Ph.D.s, 1995 (in percent)

Total Receiving Support*	137,000
National Institutes of Health	29.5
Department of Defense	21.8
National Science Foundation	20.1
Department of Energy	15.9
National Aeronautics and Space Administration	9.1
Department of Agriculture	7.8
Department of Health and Human Services	6.7
Environmental Protection Agency	4.6
Department of Education	2.8
Department of Interior	2.8
Department of Commerce	2.4
Department of Transportation	2.4
Agency for International Development	1.7
Other Agency	5.9

* In the form of contracts or grants during the week of April 15.

NOTE: Percentages do not total 100 because multiple answers were allowed.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 18 Government Support Status of Employed Science and Engineering Ph.D.s, by Employment Sector, 1995 (in percent)

		Employment Sector					
Government Support Status*	Total	Educational Institution	Private For-Profit Company	Self-Employed	Private Not-for-Profit Organization	Government**	Other Employer
Employed Population (No.)	484,800	234,900	146,700	28,600	23,800	48,000	2,700
Received Government Support	28.3	39.5	18.2	8.8	44.3	8.1	19.8
No Government Support	71.7	60.5	81.8	91.2	55.7	91.9	80.2

* In the form of contracts or grants during the week of April 15.

**All federal government employees were counted in the "no government support" category. Those in the government category who were receiving support were employed by state or local governments.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 19 Relationship of Principal Job of Science and Engineering Ph.D.s to Doctoral Degree, by Field of Doctorate, 1995 (in percent)

Relationship of Principal Job to Doctoral Degree	Field of Doctorate: All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Closely Related	68.2	80.6	66.5	56.1	51.2	71.1	70.7	70.0	79.1	72.2	80.9	62.0
Somewhat Related	24.1	16.5	24.4	33.1	34.0	22.1	22.8	23.0	16.8	20.2	15.0	29.6
Not Related	7.7	3.0	9.1	10.8	14.7	6.8	6.5	7.0	4.1	7.5	4.1	8.4

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 20 Most Important Reason for Science and Engineering Ph.D.s Working Outside Field of Degree, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Most Important Reason	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Working Outside Degree Field (No.)	37,600	*	2,100	5,700	5,100	*	*	6,900	*	5,100	3,100	6,600
Pay/Promotion Opportunities	21.8	*	30.7	26.7	19.7	*	*	20.6	*	22.8	20.0	21.8
Working Conditions	3.2	*	1.8	1.6	1.7	*	*	3.7	*	4.1	3.0	4.4
Job Location	3.9	*	4.5	4.3	2.2	*	*	3.0	*	5.0	1.8	5.5
Change in Career or Professional Interest	28.9	*	24.1	33.2	25.6	*	*	36.0	*	21.8	29.5	30.2
Family-Related Reasons	5.2	*	6.7	3.5	3.8	*	*	6.3	*	4.7	9.8	3.6
Job in Doctoral Field Not Available	26.9	*	23.7	21.2	37.0	*	*	22.3	*	32.4	22.2	24.0
Other Reason	10.1	*	8.5	9.5	10.0	*	*	8.1	*	9.2	13.7	10.5

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 21 Academically Employed Science and Engineering Ph.D.s, by Field of Doctorate and Academic Rank, 1995 (in percent)

Academic Rank	Field of Doctorate: All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/Atmospheric/Marine Sciences	Agricultural/Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Employed in Academe (No.)	211,700	3,100	14,700	15,000	13,800	6,200	8,300	48,400	8,100	43,400	26,100	24,600
Professor	37.9	9.6	46.2	43.3	39.7	37.2	42.1	36.3	25.9	39.9	34.6	37.8
Associate Professor	24.0	44.1	28.1	17.4	16.5	19.9	24.6	21.5	32.4	26.8	23.4	25.5
Assistant Professor	19.9	38.2	16.4	16.7	12.5	15.6	17.0	22.4	30.0	20.4	19.6	19.2
Instructor/Lecturer	3.0	1.6	3.3	3.1	2.2	2.9	1.8	3.7	2.2	3.0	3.9	1.6
Adjunct Faculty Member	2.2	0.9	1.2	1.8	2.6	2.6	2.3	2.0	1.6	2.6	2.8	2.1
Other	1.5	0.5	1.2	2.7	1.9	1.5	0.7	1.8	0.8	1.0	1.4	1.7
Not Applicable at Institution	2.2	0.7	0.9	4.0	7.7	4.4	1.2	1.2	0.9	0.9	2.2	3.1
Not Applicable for Position	9.5	4.5	2.6	11.1	17.0	15.9	10.4	11.3	6.2	5.4	12.2	9.1

NOTE: Academically employed includes 2-year and 4-year colleges, universities, medical schools, and university-affiliated research institutes. Those on postdoctoral appointments are not included in this table.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 22 Academically Employed Science and Engineering Ph.D.s, by Years Since Doctorate, Gender, and Academic Rank, 1995 (in percent)

		Years Since Doctorate			
Academic Rank and Gender	Total	5 Years or Less	6-15 Years	16-25 Year	More Than 25 Years
Total Employed in Academe (No.)	211,700	35,900	69,600	64,600	41,600
Professor	37.9	1.7	13.6	59.4	76.1
Associate Professor	24.0	7.9	41.1	23.0	10.7
Assistant Professor	19.9	60.6	25.5	3.5	1.0
Instructor/Lecturer	3.0	7.0	3.2	2.0	0.6
Adjunct Faculty Member	2.2	3.1	2.3	1.6	2.1
Other	1.5	2.3	1.2	0.8	2.2
Not Applicable at Institution	2.2	2.0	2.0	2.4	2.0
Not Applicable for Position	9.5	15.4	11.1	7.3	5.1
Male	163,500	22,400	49,400	53,500	38,200
Professor	43.5	1.3	15.7	62.1	78.0
Associate Professor	23.8	8.0	43.5	22.4	9.5
Assistant Professor	16.7	63.2	23.1	2.8	0.8
Instructor/Lecturer	2.1	5.5	2.5	1.5	0.6
Adjunct Faculty Member	1.7	2.4	1.7	1.4	2.0
Other	1.5	2.3	1.2	0.8	2.3
Not Applicable at Institution	2.2	2.2	2.1	2.5	2.1
Not Applicable for Position	8.4	15.0	10.3	6.7	4.6
Female	48,300	13,500	20,200	11,100	3,400
Professor	18.9	2.4	8.7	46.5	55.0
Associate Professor	24.5	7.7	35.2	25.8	23.9
Assistant Professor	30.7	56.2	31.3	7.1	3.0
Instructor/Lecturer	5.9	9.6	4.8	4.6	1.5
Adjunct Faculty Member	3.7	4.1	3.8	3.0	4.0
Other	1.4	2.3	1.1	0.9	1.0
Not Applicable at Institution	1.8	1.7	1.8	2.3	0.9
Not Applicable for Position	13.1	16.1	13.2	9.8	10.7

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total. Academically employed includes 2-year and 4-year colleges, universities, medical schools, and university-affiliated research institutes. Those on post-doctoral appointments are not included in this table.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 23 Academically Employed Science and Engineering Ph.D.s, by Field of Doctorate and Tenure Status, 1995 (in percent)

	Field of Doctorate											
Tenure Status	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Employed in Academe (No.)	211,700	3,100	14,700	15,000	13,800	6,200	8,300	48,400	8,100	43,400	26,100	24,600
Tenured	56.0	42.1	72.2	56.6	50.8	54.3	62.6	50.2	46.6	62.9	51.3	56.6
On Tenure Track	17.7	44.5	14.7	15.2	10.1	14.2	13.9	18.5	29.7	18.3	15.9	19.1
Not on Tenure Track	8.7	5.3	4.8	8.2	9.6	6.9	6.1	11.8	9.8	7.4	10.3	7.0
No Tenure System at Institution	4.5	1.1	2.6	5.2	9.6	6.4	3.0	4.6	3.9	2.6	5.6	5.2
No Tenure for My Position	13.1	7.0	5.7	14.8	20.0	18.2	14.5	14.9	9.9	8.9	16.9	12.1

NOTE: Academically employed includes 2-year and 4-year colleges, universities, medical schools, and university-affiliated research institutes. Those on postdoctoral appointments are not included in this table.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 24 Academically Employed Science and Engineering Ph.D.s, by Years Since Doctorate, Gender, and Tenure Status, 1995 (in percent)

		Years Since Doctorate			
Tenure Status and Gender	Total	5 Years or Less	6-15 Years	16-25 Years	More Than 25 Years
Total Employed in Academe (No.)	211,700	35,900	69,600	64,600	41,600
Tenured	56.0	6.1	47.2	76.7	81.8
On Tenure Track	17.7	51.6	23.2	3.4	1.1
Not on Tenure Track	8.7	18.3	9.6	5.6	3.9
No Tenure System at Institution	4.5	4.3	5.1	4.9	3.3
No Tenure for My Position	13.1	19.7	14.9	9.4	10.0
Male	163,500	22,400	49,400	53,500	38,200
Tenured	61.4	5.0	51.0	79.2	82.8
On Tenure Track	15.4	54.2	22.5	2.9	0.9
Not on Tenure Track	7.2	18.6	7.7	4.6	3.3
No Tenure System at Institution	4.6	4.4	5.2	5.0	3.3
No Tenure for My Position	11.5	17.8	13.5	8.3	9.7
Female	48,300	13,500	20,200	11,100	3,400
Tenured	38.0	8.0	37.8	64.7	70.5
On Tenure Track	25.3	47.4	25.1	5.8	3.3
Not on Tenure Track	14.1	17.9	14.1	10.6	10.0
No Tenure System at Institution	4.4	4.0	4.8	4.3	3.3
No Tenure for My Position	18.2	22.8	18.1	14.6	12.8

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total. Academically employed includes 2-year and 4-year colleges, universities, medical schools, and university-affiliated research institutes. Those on postdoctoral appointments are not included in this table.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 25 Number of Postdocs Ever Held by Science and Engineering Ph.D.s, by Field of Doctorate and Years Since Doctorate, 1995 (in percent)

Years Since Doctorate and Number of Postdocs	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)	542,500	6,600	25,200	61,400	38,700	16,500	22,400	109,900	16,900	75,800	82,200	87,000
None	66.4	89.7	81.1	52.1	49.3	65.6	73.3	38.3	79.5	88.2	74.7	82.6
1	25.0	9.7	13.8	35.5	36.1	28.9	20.4	41.7	17.2	9.1	21.1	15.6
2	6.7	0.6	3.7	9.7	11.8	4.4	5.0	15.5	2.3	1.9	3.2	1.4
3 or More	1.9	0.0	1.4	2.7	2.7	1.1	1.4	4.5	0.9	0.7	1.0	0.4
5 Years or Less	104,200	3,400	3,800	9,200	6,100	3,200	3,800	21,200	5,000	12,400	16,000	20,100
None	59.6	87.9	69.7	39.0	28.4	49.9	55.9	29.1	78.8	90.1	71.4	73.4
1	32.0	11.0	19.0	50.6	50.2	41.2	34.6	51.8	19.4	8.8	25.0	23.9
2	7.2	1.1	7.7	9.6	19.1	6.5	7.5	17.0	1.4	1.0	2.4	2.4
3 or More	1.2	0.0	3.6	0.9	2.3	2.4	2.0	2.1	0.3	0.1	1.1	0.3
6-10 Years	88,800	2,000	3,000	8,700	5,000	2,500	3,500	17,400	3,500	11,400	14,500	17,200
None	63.4	92.1	81.0	44.1	38.9	54.1	64.7	27.5	81.7	91.2	73.1	81.1
1	26.8	7.8	14.3	42.1	40.9	34.9	28.5	46.6	16.0	6.4	23.0	16.5
2	7.7	0.1	4.7	11.9	15.6	9.1	6.3	19.8	1.2	1.9	2.8	2.0
3 or More	2.1	0.0	0.0	2.0	4.6	1.9	0.4	6.1	1.1	0.5	1.0	0.4
11-15 Years	78,600	*	3,000	7,400	4,500	2,300	3,800	17,000	2,900	12,200	15,400	9,400
None	65.0	*	81.4	54.0	48.6	60.4	73.2	32.0	77.0	85.9	74.1	85.7
1	25.8	*	12.8	35.8	37.2	34.8	17.2	43.8	20.1	12.3	22.1	12.5
2	7.3	*	3.3	8.3	12.1	3.3	7.9	18.9	2.6	1.7	3.6	0.9
3 or More	1.8	*	2.5	1.9	2.1	1.4	1.7	5.3	0.3	0.1	0.2	0.9

16-20 years	76,700	*	3,800	6,800	5,500	2,500	2,900	16,100	2,100	13,300	13,700	9,700
None	66.5	*	83.8	53.4	46.5	66.5	78.7	35.2	80.3	87.4	75.2	84.2
1	24.7	*	11.7	34.0	42.8	29.6	17.2	43.1	15.0	9.9	19.4	14.0
2	6.8	*	4.1	10.1	7.8	3.9	3.7	16.6	3.0	1.8	4.5	1.6
3 or More	1.9	*	0.4	2.5	2.9	0.1	0.4	5.1	1.7	0.8	0.9	0.3
21-25 Years	78,000	*	5,200	8,800	6,500	2,300	3,200	15,000	2,000	12,300	10,000	12,600
None	70.4	*	89.1	44.8	55.4	73.4	82.5	47.7	83.6	88.9	80.7	83.7
1	21.6	*	9.1	38.2	31.2	24.9	13.9	35.4	11.8	7.6	15.5	15.5
2	5.8	*	1.5	11.3	11.1	1.4	2.1	12.8	2.4	2.5	2.2	0.8
3 or More	2.2	*	0.3	5.6	2.4	0.3	1.5	4.1	2.3	1.1	1.6	0.1
More Than 25 Years	116,300	*	6,400	20,400	11,200	3,600	5,300	23,200	1,500	14,100	12,600	18,100
None	72.9	*	79.5	63.6	63.5	85.2	83.1	55.4	75.0	86.4	76.0	90.8
1	19.5	*	16.1	25.0	25.6	12.1	12.5	30.4	17.4	9.5	19.3	8.2
2	5.4	*	2.7	8.6	8.5	2.1	2.7	9.5	6.6	2.3	3.6	0.6
3 or More	2.3	*	1.6	2.8	2.4	0.6	1.7	4.7	1.1	1.7	1.1	0.4

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

BLE 26 Reasons for Holding Postdocs for Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Ever Holding Postdoc	182,300	*	4,800	29,400	19,600	5,700	5,900	67,900	3,500	8,900	20,800	15,200
Reason for First Postdoc												
Additional Training in Field	46.7	*	39.8	43.4	49.0	31.8	42.1	50.0	49.6	33.7	61.8	32.5
Training Out of Field	14.8	*	9.2	17.7	9.8	5.7	9.8	18.6	16.0	18.1	10.7	9.6
Work With Specific Person or Place	21.3	*	32.2	19.2	22.5	38.9	14.9	20.7	18.2	23.2	15.0	26.1
No Other Employment Available	11.1	*	10.6	14.1	13.6	17.6	26.4	6.2	9.9	10.3	5.0	24.6
Other Reason	6.1	*	8.2	5.5	5.1	5.9	6.7	4.6	6.3	14.7	7.5	7.2
Total with Only One Postdoc	135,900	*	3,500	21,800	14,000	4,800	4,600	45,900	2,900	6,900	17,400	13,600
Reason for First Postdoc												
Additional Training in Field	45.8	*	36.1	42.2	47.0	31.3	39.6	49.5	50.4	34.8	63.0	31.8
Training Out of Field	14.7	*	10.1	17.9	10.6	5.5	10.1	18.9	16.8	18.5	9.5	9.7
Work With Specific Person or Place	21.8	*	35.2	20.5	22.7	38.2	15.6	21.4	16.8	22.6	14.9	25.9
No Other Employment Available	11.7	*	10.8	14.5	15.2	18.3	28.0	6.2	10.1	10.2	4.5	25.1
Other Reason	6.0	*	7.8	4.8	4.5	6.6	6.7	4.1	5.9	14.0	8.1	7.5
Total With More Than One Postdoc	46,400	*	*	7,600	5,600	*	*	22,000	*	2,000	3,400	1,600
Reason for First Postdoc												
Additional Training in Field	49.3	*	*	46.9	54.0	*	*	51.1	*	30.1	55.9	38.7
Training Out of Field	15.3	*	*	17.0	8.0	*	*	18.1	*	16.7	16.7	8.6
Work With Specific Person or Place	19.7	*	*	15.4	21.9	*	*	19.2	*	25.3	15.6	27.7
No Other Employment Available	9.3	*	*	13.1	9.6	*	*	6.2	*	10.6	7.5	20.3
Other Reason	6.5	*	*	7.6	6.5	*	*	5.5	*	17.2	4.4	4.7
Reason for Second Postdoc												
Additional Training in Field	34.8	*	*	28.0	34.9	*	*	36.6	*	26.2	51.1	26.3
Training Out of Field	17.6	*	*	18.9	8.9	*	*	19.8	*	23.6	16.1	15.9
Work With Specific Person or Place	24.9	*	*	21.6	28.5	*	*	24.8	*	27.5	16.5	34.1
No Other Employment Available	14.3	*	*	17.5	20.2	*	*	11.5	*	7.6	11.9	21.2
Other Reason	8.4	*	*	14.0	7.5	*	*	7.3	*	15.2	4.3	2.5

*Too few cases to estimate.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 27 1995 Postdoc Status of Science and Engineering Ph.D.s, by Field of Doctorate and Years Since Doctorate, 1995 (in percent)

Years Since Doctorate and Postdoc Status	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
		Field of Doctorate										
Total Population (No.)	542,500	6,600	25,200	61,400	38,700	16,500	22,400	109,900	16,900	75,800	82,200	87,000
On Postdoc in 1995	4.2	2.4	2.2	4.0	7.0	4.4	4.2	9.9	3.0	0.7	1.9	2.0
5 Years or Less	104,200	3,400	3,800	9,200	6,100	3,200	3,800	21,200	5,000	12,400	16,000	20,100
On Postdoc in 1995	18.6	4.6	12.7	23.0	38.6	17.7	20.2	43.8	8.8	3.1	7.4	8.1
6-10 Years	88,800	2,000	3,000	8,700	5,000	2,500	3,500	17,400	3,500	11,400	14,500	17,200
On Postdoc in 1995	2.4	0.1	0.8	2.1	4.5	2.7	3.3	6.7	1.2	0.4	1.1	0.7
Il-15 Years	78,600	*	3,000	7,400	4,500	2,300	3,800	17,000	2,900	12,200	15,400	9,400
On Postdoc in 1995	0.7	*	0.5	0.3	1.4	2.1	0.6	1.0	0.3	0.2	0.7	0.3
More Than 15 Years	270,900	*	15,400	36,000	23,200	8,400	11,400	54,300	5,500	39,700	36,300	40,400
On Postdoc in 1995	0.3	*	0.2	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.0

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 28 Characteristics of Science and Engineering Ph.D.s on Postdoctoral Appointments, by Selected Field of Doctorate, 1995 (in percent)

	Field of Doctorate					
Characteristics	All Fields*	Chemistry	Physics and Astronomy	Biological Sciences	Psychology	Engineering
Total 1995 Postdocs	22,800	2,400	2,700	10,900	1,600	1,800
Years Since Doctorate						
5 Years or Less	84.9	87.0	86.2	85.5	75.3	91.6
6-10 Years	9.4	7.5	8.3	10.7	9.8	6.7
11-15 Years	2.3	0.9	2.2	1.6	7.2	1.8
25 Years or More	3.4	4.6	3.3	2.1	7.8	0.0
Gender						
Male	66.8	74.0	92.2	59.6	35.3	86.0
Female	33.2	26.0	7.8	40.4	64.7	14.0
Race/Ethnic Group**						
White	67.6	57.2	63.6	71.3	88.4	40.5
Black	1.5	2.0	0.3	1.3	1.9	0.5
Asian	27.0	35.6	33.8	23.8	5.2	56.5
Native American	3.5	5.1	0.6	3.4	3.1	2.3
Hispanic	0.3	0.1	0.8	0.2	0.5	0.1
Age in 1995						
34 or Younger	58.1	66.0	71.8	60.3	39.2	62.1
35-44	33.9	27.4	23.2	34.6	34.3	32.2
45 or Older	7.9	6.7	5.0	4.8	26.7	5.7
Citizenship						
U.S. Citizen	71.0	62.5	64.0	76.3	93.7	36.9
Non U.S. Citizen	29.0	37.5	36.0	23.7	6.3	63.1
Sector						
Educational Institution	54.9	53.6	51.1	57.1	49.8	48.2
Business/Industry	6.6	4.9	6.0	6.9	5.7	12.0
Government	33.1	38.9	40.0	30.5	24.5	38.9
Other	5.4	2.5	2.9	5.6	20.0	0.9
Employment Benefits***						
Received Health Benefits	83.5	88.7	89.6	86.7	57.1	73.3
Received Pension Benefits	37.2	43.3	49.6	34.5	17.9	31.9

*Includes all science and engineering doctorates on postdoctoral appointments in 1995, including fields not shown separately in this table.

** Regardless of citizenship status.

***Does not add to 100 because some respondents had both benefits.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 29 Relevance of Most Recent Postdoc to Principal Job for Science and Engineering Ph.D.s, by Selected Field of Doctorate and Years Since Doctorate, 1995 (in percent)

	Field of Doctorate					
Years Since Doctorate and Relevance of Postdoc	All Fields	Chemistry	Physics and Astronomy	Biological Sciences	Psychology	Engineering
Total (No.)*	159,400	26,900	16,900	56,900	19,200	13,400
Subject Matter	84.5	77.2	77.0	87.5	92.6	82.0
Specific Skills	72.6	62.1	66.9	75.4	77.2	69.4
Contacts With Colleagues	79.6	72.0	75.6	81.9	86.5	77.4
Use of Equipment	58.4	61.9	56.3	69.5	46.2	52.4
General Approach	90.4	90.0	92.0	91.9	91.8	89.0
5 Years or Less	22,600	3,500	2,000	5,700	3,300	3,700
Subject Matter	90.7	89.1	84.2	90.6	98.2	87.1
Specific Skills	80.3	76.1	74.9	76.7	87.3	79.1
Contacts With Colleagues	86.3	83.2	75.0	86.7	96.5	82.8
Use of Equipment	64.9	76.6	73.3	72.5	49.8	61.3
General Approach	93.1	97.5	93.3	90.5	96.4	91.8
6-10 Years	30,300	4,700	2,800	11,500	3,800	3,100
Subject Matter	89.3	80.7	85.7	92.5	95.5	86.4
Specific Skills	80.9	71.7	80.3	83.0	86.4	79.5
Contacts With Colleagues	85.2	75.8	87.5	88.5	89.2	81.9
Use of Equipment	69.2	69.6	67.5	80.7	57.3	62.4
General Approach	93.0	92.4	95.6	94.5	90.0	95.0
11-15 Years	27,000	3,400	2,200	11,400	3,900	**
Subject Matter	87.1	83.6	77.5	89.8	92.3	**
Specific Skills	75.1	65.6	71.2	78.7	74.4	**
Contacts With Colleagues	81.8	73.4	80.5	83.9	83.4	**
Use of Equipment	62.2	63.5	65.0	72.9	48.7	**
General Approach	91.0	91.9	90.3	93.5	90.6	**
16-20 Years	25,400	3,200	2,900	10,300	3,400	1,500
Subject Matter	82.1	75.3	69.1	86.3	89.7	78.1
Specific Skills	71.1	58.6	65.7	75.1	72.0	64.1
Contacts With Colleagues	77.4	68.1	69.1	81.5	84.4	70.6
Use of Equipment	54.5	61.2	52.0	66.4	38.2	53.2
General Approach	90.4	89.7	92.9	92.5	90.6	86.2
21-25 Years	22,800	4,800	2,800	7,800	1,800	2,100
Subject Matter	77.5	67.6	69.8	83.0	85.7	74.6
Specific Skills	61.0	50.7	54.8	67.2	66.9	44.3
Contacts With Colleagues	72.2	60.7	73.4	75.1	82.8	72.4
Use of Equipment	49.4	52.8	48.5	61.2	39.7	31.5
General Approach	87.8	88.2	89.4	91.7	92.2	79.4
More than 25 Years	26,300	7,400	4,100	10,200	3,000	1,700
Subject Matter	80.0	73.3	77.9	82.1	90.8	77.3
Specific Skills	66.3	56.7	60.6	69.2	70.1	68.4
Contacts With Colleagues	74.6	72.6	71.4	75.1	80.7	68.7
Use of Equipment	49.8	55.5	44.0	61.0	38.0	39.7
General Approach	87.5	85.2	90.8	87.4	91.3	88.0

NOTE: Percentages represent those who said the aspect of postdoc training was "a great deal" or "somewhat" relevant to their principal job.
*Includes those who held at least one postdoc, but whose principal job was not a postdoc in April 1995.
**Too few cases to estimate.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 30 Second Job Status and Occupation of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

Second Job Status and Occupation	Field of Doctorate: All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/Atmospheric/Marine Sciences	Agricultural/Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Employed Population (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Held Second Job	15.5	12.2	9.8	8.9	9.4	10.8	12.2	10.8	20.7	19.3	32.7	11.4
No Second Job	84.5	87.8	90.2	91.1	90.6	89.2	87.8	89.2	79.3	80.7	67.3	88.6
Total Holding Second Job (No.)	75,300	*	2,200	4,700	3,300	1,600	2,300	10,500	3,200	13,000	24,800	8,900
Occupation of Second Job												
Scientists	43.9	*	32.2	34.3	26.5	40.0	42.2	42.7	54.5	36.6	64.7	9.9
Computer Scientists	2.3	*	9.2	1.2	4.3	2.6	2.6	1.3	1.1	1.0	1.0	4.1
Mathematical Scientists	1.6	*	21.2	0.0	0.5	1.0	0.7	1.4	1.2	1.3	0.9	1.1
Chemists	1.2	*	0.0	18.6	0.0	0.0	0.8	0.2	0.2	0.0	0.0	0.0
Physicists	0.9	*	0.3	0.1	16.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Earth/Atmospheric/Marine Scientists	1.0	*	0.0	2.2	1.5	31.8	0.0	0.1	0.0	0.2	0.0	0.6
Agricultural/Environmental Scientists	1.0	*	0.0	0.1	0.0	0.0	23.2	1.4	0.0	0.0	0.0	0.2
Biological Scientists	4.8	*	0.1	5.1	1.9	4.6	11.1	23.2	8.3	0.0	0.8	0.7
Health Scientists	6.2	*	1.4	6.1	0.6	0.0	1.9	14.6	40.9	3.0	3.8	1.4
Social Scientists	5.4	*	0.0	0.0	1.5	0.0	2.0	0.3	1.0	29.2	0.5	0.1
Psychologists	19.4	*	0.0	0.8	0.0	0.0	0.0	0.1	1.7	1.8	57.6	0.1
Engineers	6.8	*	3.7	2.3	9.3	5.2	2.7	1.0	0.8	0.2	0.0	48.3
Postsecondary Teachers of Science	18.3	*	30.3	23.0	21.0	19.3	11.6	24.8	22.5	19.7	17.0	5.3
Postsecondary Teachers of Engineering	1.8	*	0.7	0.4	2.0	0.0	0.1	0.5	0.3	0.0	0.0	12.9
Other Teachers and Professors	4.3	*	2.6	3.5	4.0	2.8	0.0	2.7	4.2	10.8	3.4	1.9
Top/Mid-Level Managers	2.0	*	2.6	1.9	1.5	1.7	2.9	2.8	2.8	1.9	1.2	3.3
Management-Related Occupations	2.1	*	0.7	1.5	2.6	1.7	1.5	1.1	1.5	4.7	1.2	2.3
Technologists	1.7	*	8.5	2.9	6.9	5.3	1.6	1.3	1.1	1.3	0.4	1.5
Other Occupations	19.2	*	18.7	30.1	26.2	24.0	37.5	23.0	12.3	24.9	12.1	14.6

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 31 Second Job Status of Science and Engineering Ph.D.s, by Employment Sector,* 1995 (in percent)

		Employment Sector					
Second Job Status	Total	Educational Institution	Private For-Profit Company	Self-Employed	Private Not-for-Profit Organization	Government	Other Employer
Employed Population (No.)	484,800	234,900	146,700	28,600	23,800	48,000	2,700
Held Second Job	15.5	18.2	8.9	20.2	23.1	16.6	11.8
No Second Job	84.5	81.8	91.1	79.8	76.9	83.4	88.2

*Employment sector of principal job.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 32 Relationship of Second Job of Science and Engineering Ph.D.s to Doctoral Degree, by Field of Doctorate, 1995 (in percent)

Relationship	Field of Doctorate											
	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Holding Second Job (No.)	75,300	*	2,200	4,700	3,300	1,600	2,300	10,500	3,200	13,000	24,800	8,900
Closely Related	65.9	*	51.8	52.5	37.2	57.8	54.7	52.2	68.6	65.1	82.3	61.2
Somewhat Related	19.4	*	26.9	19.4	25.7	18.8	25.0	26.6	20.9	23.0	11.2	23.0
Not Related	14.8	*	21.3	28.1	37.0	23.4	20.3	21.2	10.5	12.0	6.6	15.8

*Too few cases to estimate.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 33 Employment Changes of Science and Engineering Ph.D.s Since 1993, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
1995 Status	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Employed in 1995 (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Not Employed in 1993	4.8	7.4	3.0	4.1	4.1	4.7	5.2	5.4	5.1	4.9	3.9	5.7
No Change Since 1993	73.5	60.3	77.9	72.6	74.0	74.1	74.9	72.1	71.6	77.1	75.1	70.7
Change in Employer and Job	10.1	18.7	7.4	10.5	9.9	10.3	7.2	11.2	12.2	8.5	9.6	10.7
Change in Employer Only	4.5	5.4	5.6	3.5	4.6	4.0	4.3	4.5	4.7	3.9	5.8	4.2
Change in Job Only	7.1	8.1	6.0	9.2	7.4	6.9	8.4	6.8	6.4	5.6	5.6	8.7

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 34 Reasons for Changing Employer or Job Between 1993 and 1995 for Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Reasons for Changing*	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Changing (No.)	105,300	2,100	4,300	12,200	7,500	3,100	3,900	22,000	3,600	12,200	15,900	18,600
Pay/Promotion Opportunities	52.4	59.9	46.1	52.6	42.1	53.7	59.2	53.1	59.7	55.7	51.9	51.6
Working Conditions	28.4	21.8	27.9	23.1	18.1	25.2	24.8	28.9	37.1	30.7	39.3	24.8
Job Location	21.3	30.1	15.9	17.5	14.7	24.1	19.3	21.9	25.3	24.6	25.2	19.6
Family-Related Reasons	10.9	8.7	8.3	7.3	8.9	10.5	10.3	10.5	15.5	13.4	16.8	8.3
School-Related Reasons	13.8	17.1	17.1	13.0	12.2	9.8	9.8	17.2	12.8	10.9	15.8	11.7
Laid Off/Job Terminated	19.0	15.1	20.6	18.5	33.4	25.2	19.3	18.6	16.5	15.7	16.1	18.2
Retired	3.8	0.8	4.5	4.2	5.8	3.5	3.6	4.1	4.5	3.5	4.0	2.4
Other Reason	11.2	9.0	12.2	11.6	11.5	16.7	8.4	9.5	6.8	13.7	13.0	10.4

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Percentages may total more than 100 because multiple answers were allowed.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 35 Number of Articles and Papers Authored Between April 1990 and April 1995 by Science and Engineering Ph.D.s, by Field of Doctorate and Employment Sector, 1995 (in percent)

Field of Doctorate and Employment Sector	Total Number Employed	Total Number of Articles						Total Number of Papers					
		None	1-2	3-5	6-10	More Than 10	Mean No. of Articles	None	1-2	3-5	6-10	More Than 10	Mean No. of Papers
Total	484,800	37.1	19.7	18.0	12.8	12.4	4.7	26.7	16.8	21.7	17.6	17.1	6.4
Field of Doctorate													
Computer Sciences	6,400	32.6	25.3	22.6	10.5	8.9	3.6	13.9	20.2	21.7	18.7	25.5	8.4
Mathematical Sciences	22,800	37.9	22.3	17.1	13.3	9.4	4.0	32.8	18.9	23.9	14.2	10.2	4.4
Chemistry	52,500	41.6	18.9	17.2	10.8	11.6	4.6	33.8	19.5	21.9	13.3	11.4	4.9
Physics and Astronomy	34,400	33.3	16.9	15.8	14.6	19.5	6.7	25.2	14.2	21.0	18.9	20.7	7.8
Earth/Atmospheric/Marine Sciences	14,400	23.3	20.9	21.7	18.9	15.2	5.6	14.7	12.2	24.1	23.9	25.2	8.6
Agricultural/Environmental Sciences	19,300	33.9	18.6	17.7	15.1	14.7	4.9	23.5	15.3	19.3	20.8	21.1	7.5
Biological Sciences	97,400	22.4	17.5	21.5	18.0	20.7	7.0	19.2	15.3	23.8	19.9	21.7	7.7
Health Sciences	15,500	26.6	23.9	20.5	14.1	14.8	5.4	18.0	15.5	21.4	21.8	23.2	8.3
Social Sciences	67,600	40.9	22.1	19.6	11.0	6.4	3.1	23.7	16.7	25.2	20.8	13.6	5.5
Psychology	75,800	56.1	17.2	11.9	7.7	7.0	2.8	42.1	16.9	16.1	12.4	12.5	4.7
Engineering	78,600	37.9	22.3	18.4	11.8	9.7	4.1	23.8	18.5	21.1	17.6	18.9	7.1
Employment Sector*													
Educational Institution	234,900	22.3	19.0	21.6	18.2	18.9	6.7	15.1	14.6	23.2	22.4	24.8	8.8
Private For-Profit Company	146,700	52.1	21.6	14.7	7.2	4.4	2.4	38.1	20.8	21.2	12.1	7.8	3.9
Self-Employed	28,600	71.7	15.3	8.4	2.5	2.0	1.1	58.8	16.8	13.5	6.5	4.5	2.4
Private Not-for-Profit Organization	23,800	42.3	20.5	16.1	9.9	11.1	4.4	31.4	15.3	22.3	16.4	14.7	6.3
Government	48,000	39.6	18.7	17.1	11.9	12.6	4.4	27.6	16.0	20.3	18.7	17.5	3.9

*Those reporting "other" types of employers are not included.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 36 Number of Articles and Papers Authored Between April 1990 and April 1995 by Science and Engineering Ph.D.s, by Academic Position and Tenure Status, 1995 (in percent)

Academic Position and Tenure Status	Total Number Employed in Academe	Total Number of Articles						Total Number of Papers					
		None	1-2	3-5	6-10	More Than 10	Mean No. of Articles	None	1-2	3-5	6-10	More Than 10	Mean No. of Papers
Total	229,500	21.0	19.1	22.0	18.6	19.3	6.9	13.9	14.4	23.5	22.9	25.3	8.9
Academic Position*													
Postdoc Appointee	17,700	6.2	19.2	38.4	24.3	11.9	5.4	4.9	16.5	36.8	27.6	14.2	6.3
Full Professor	80,200	22.8	16.5	17.3	17.4	26.0	9.2	14.8	13.7	21.0	21.8	28.8	10.4
Associate Professor	50,700	19.4	18.4	21.8	18.9	21.6	7.2	12.8	13.1	20.9	23.6	29.5	10.2
Assistant Professor	42,100	13.6	21.6	26.4	23.3	15.0	5.9	7.6	13.3	25.2	26.7	27.2	9.0
Instructor/Lecturer	6,300	39.2	23.9	20.6	11.6	4.7	3.0	26.8	20.3	27.5	16.3	9.0	4.2
Adjunct Faculty	4,700	41.8	24.2	16.2	11.1	6.6	3.2	31.9	19.0	22.4	15.0	11.8	4.9
Not Applicable	24,700	32.1	22.1	20.3	13.4	12.1	4.9	23.1	17.3	22.8	19.1	17.8	6.6
Tenure Status													
Postdoc Appointee	17,700	6.2	19.2	38.4	24.3	11.9	5.4	4.9	16.5	36.8	27.6	14.2	6.3
Tenured	118,600	22.3	17.5	19.0	17.7	23.5	8.2	14.5	14.0	21.0	22.4	28.1	10.1
On Tenure Track	37,400	11.5	20.2	26.5	24.1	17.7	6.5	6.3	11.9	23.8	27.5	30.5	9.8
Not Tenured	18,500	22.6	22.1	21.1	18.8	15.3	5.7	15.4	15.1	28.1	21.0	20.3	7.3
Not Applicable	37,200	32.4	21.5	19.6	13.2	13.3	5.1	23.0	16.7	22.6	18.6	19.1	7.0

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Those reporting "other" academic ranks were not included in this table.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 37 Patent Activities Between April 1990 and April 1995 for Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctoarte											
Patent Activities	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Employed (No.)	484,800	6,400	22,800	52,500	34,400	14,400	19,300	97,400	15,500	67,600	75,800	78,600
Named as Inventor	12.4	14.3	3.8	30.9	17.4	4.7	8.2	13.0	5.6	0.4	0.9	24.6
Not Named as Inventor	87.6	85.7	96.2	69.1	82.6	95.3	91.8	87.0	94.4	99.6	99.1	75.4
Total Named on Patent Applications	60,100	*	*	16,300	6,000	*	1,600	12,600	*	*	*	19,300
Number of Applications												
1-2	59.4	*	*	47.6	57.1	*	78.5	71.0	*	*	*	59.0
3-10	35.6	*	*	44.3	38.3	*	21.5	26.1	*	*	*	36.8
More Than 10	5.0	*	*	8.1	4.6	*	0.0	2.8	*	*	*	4.2
Number of Patents Granted												
None	30.0	*	*	20.9	22.4	*	37.1	43.8	*	*	*	28.2
1-2	45.9	*	*	42.4	51.0	*	48.1	44.5	*	*	*	48.1
3-10	20.6	*	*	29.9	23.3	*	14.8	11.1	*	*	*	20.5
More Than 10	3.5	*	*	6.9	3.4	*	0.0	0.5	*	*	*	3.1
Total with Patents Granted	42,100	*	*	12,900	4,600	*	*	7,100	*	*	*	13,900
Number of Products/Licenses												
None	48.3	*	*	46.0	51.9	*	*	55.8	*	*	*	47.9
1-2	39.2	*	*	37.1	39.3	*	*	36.4	*	*	*	40.1
More Than 2	12.5	*	*	16.9	8.9	*	*	7.9	*	*	*	12.0

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 38 Membership of Science and Engineering Ph.D.s in Professional Societies, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
Membership	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)*	542,100	6,600	25,100	61,300	38,700	16,500	22,400	109,700	16,900	75,700	82,100	86,900
None	15.6	19.6	18.1	15.8	20.8	9.4	13.4	16.0	7.1	17.7	12.5	16.2
One	21.1	22.4	23.5	28.3	27.4	17.4	18.7	16.6	13.7	14.6	22.9	25.0
Two	23.7	31.2	27.2	26.9	24.3	21.9	25.0	20.5	22.4	21.4	23.8	25.6
Three	17.4	14.6	15.9	15.6	15.4	20.2	19.2	18.4	20.6	19.5	17.1	15.7
Four or More	22.3	12.3	15.3	13.4	12.2	31.1	23.7	28.6	36.3	26.8	23.7	17.6

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Those who reported that they had never worked were excluded.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 39 Work or Research Activities Outside the United States by Science and Engineering Ph.D.s Since Earning the Doctorate, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)*	542,100	6,600	25,100	61,300	38,700	16,500	22,400	109,700	16,900	75,700	82,100	86,900
Conducted Foreign Work/Research	38.4	34.1	39.4	38.2	44.6	59.2	49.5	35.1	29.1	52.0	19.6	40.6
Did Not Conduct Foreign Work/Research	61.6	65.9	60.6	61.8	55.4	40.8	50.5	64.9	70.9	48.0	80.4	59.4
Total Conducting Foreign Work/Research Outside the U.S.	207,900	2,200	9,900	23,400	17,300	9,700	11,100	38,500	4,900	39,400	16,100	35,300
Length of Last Trip												
Less Than One Week	21.6	21.1	21.0	27.7	19.8	15.0	18.6	19.7	31.5	13.2	24.8	30.2
7 to 30 days	43.1	45.8	38.4	38.9	42.4	54.0	55.0	40.4	42.2	44.7	42.0	42.5
1 to 6 months	18.6	18.9	22.3	14.0	18.9	20.4	12.0	20.3	14.8	26.0	17.0	13.0
More than 6 months	16.7	14.1	18.3	19.3	19.0	10.7	14.4	19.6	11.4	16.1	16.2	14.4
Total Not Conducting Foreign Work/Research Outside the U.S.	334,100	4,300	15,200	37,900	21,400	6,700	11,300	71,300	12,000	36,300	66,000	51,600
Reasons for Not Conducting Work/Research**												
Not Relevant to Career	38.7	27.4	36.0	41.9	41.0	34.9	28.7	32.9	30.2	42.3	44.7	39.4
No Interest	20.7	21.3	28.1	21.5	20.0	16.7	18.4	19.0	18.7	15.1	25.2	20.3
No Time	35.6	46.8	34.3	28.2	31.6	32.5	33.5	37.9	37.8	37.5	40.7	31.5
Unable to Identify Host Institution	17.3	24.0	20.4	15.3	16.9	18.6	18.4	13.8	21.2	16.7	17.1	21.8
Concerns About Losing Place in Job Market	16.1	17.1	11.9	16.7	19.2	10.1	15.0	17.5	13.6	11.2	17.6	16.5
Unaware of Funding Sources	31.3	39.2	31.0	24.3	28.2	33.8	34.2	29.5	37.8	30.6	35.3	32.2
Lack of Foreign Language Skills	15.5	14.8	13.8	12.8	11.8	12.0	20.4	13.7	17.3	17.3	20.5	13.7
Family-Related Reasons	36.5	41.9	39.8	30.6	34.3	29.7	36.7	41.4	41.5	36.7	39.3	29.7
Other Reasons	10.8	7.6	9.8	12.4	11.4	12.8	15.8	10.1	10.5	12.2	7.5	13.1

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.
*Those who reported that they had never worked were excluded.
**Percentages may total more than 100 because multiple answers were allowed.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 40 Work-Related Training Activities Between April 1994 and April 1995 of Science and Engineering Ph.D.s, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)*	542,100	6,600	25,100	61,300	38,700	16,500	22,400	109,700	16,900	75,700	82,100	86,900
Taken Work-Related Training	52.1	53.8	43.4	49.4	39.2	47.4	58.5	46.6	69.2	48.1	71.8	50.1
No Work-Related Training	47.9	46.2	56.6	50.6	60.8	52.6	41.5	53.4	30.8	51.9	28.2	49.9
Total with Training (No.)	282,600	3,500	10,900	30,300	15,200	7,800	13,100	51,100	11,700	36,400	58,900	43,500
Types of Work-Related Training**												
Management/Supervisor Training	27.7	21.3	17.9	37.7	29.2	24.3	34.8	28.9	31.7	25.5	17.3	35.1
Training in Occupational Field	77.7	79.9	79.1	71.1	69.5	73.1	75.4	76.1	85.8	69.9	91.5	73.7
General Professional Training	19.8	14.8	15.4	23.3	18.9	18.0	24.6	18.6	19.3	23.4	15.5	22.3
Other Work-Related Training	16.5	18.3	16.8	17.0	19.1	21.7	17.1	17.1	16.2	22.5	11.2	15.2
Reasons for Taking Training**												
Change Occupational Field	11.1	10.1	14.8	12.3	11.7	11.5	11.0	10.7	12.4	9.4	9.6	13.1
Further Skills in Occupational Field	91.8	88.9	92.8	89.3	86.7	86.0	92.4	91.7	95.9	89.6	96.6	90.7
Licensure/Certification	18.2	3.6	4.2	6.7	5.3	7.6	17.6	15.5	38.5	8.9	45.3	6.0
Increase Opportunities	29.6	33.8	32.3	33.8	28.6	28.5	34.0	29.1	32.3	28.1	22.4	35.8
Learn Skills for New Position	26.6	34.5	24.7	32.8	29.6	27.3	24.4	27.5	29.2	21.3	19.4	33.6
Required or Expected by Employer	33.0	34.0	32.0	42.1	40.7	34.4	36.1	33.0	32.2	32.5	23.0	37.4
Other Reasons	7.1	7.8	7.9	6.6	7.3	9.2	6.0	6.6	6.0	10.5	6.5	5.8

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.

*Those who reported that they had never worked were excluded.

**Percentages may total more than 100 because multiple answers were allowed.

SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

TABLE 41 Continuing Education of Science and Engineering Ph.D.s Between April 1993 and April 1995, by Field of Doctorate, 1995 (in percent)

	Field of Doctorate											
	All Fields	Computer Sciences	Mathematical Sciences	Chemistry	Physics and Astronomy	Earth/ Atmospheric/ Marine Sciences	Agricultural/ Environmental Sciences	Biological Sciences	Health Sciences	Social Sciences	Psychology	Engineering
Total Population (No.)	542,500	6,600	25,200	61,400	38,700	16,500	22,400	109,900	16,900	75,800	82,200	87,000
Courses Taken												
Took Courses	5.9	5.2	5.1	5.2	4.8	6.3	5.8	5.9	8.5	5.4	6.9	5.9
Did Not Take Courses	94.1	94.8	94.9	94.8	95.2	93.7	94.2	94.1	91.5	94.6	93.1	94.1
Total Taking Courses	32,000	**	**	3,200	1,900	**	**	6,500	**	4,100	5,700	5,200
Reasons for Taking Courses*												
Further Education Before Career	25.3	**	**	22.9	32.5	**	**	33.2	**	20.6	17.6	25.0
Prepare for Graduate School	2.1	**	**	0.1	5.5	**	**	1.9	**	1.4	0.8	4.1
Change Field	26.3	**	**	24.0	40.9	**	**	32.2	**	27.4	20.4	24.1
Gain Further Skills	62.5	**	**	52.6	58.3	**	**	62.6	**	61.9	67.8	61.0
Licensure/Certification	18.9	**	**	17.6	7.5	**	**	25.5	**	15.0	30.2	7.1
Increase Opportunities	37.8	**	**	42.3	34.4	**	**	41.6	**	33.2	28.4	46.4
Required by Employer	9.6	**	**	14.5	10.2	**	**	10.9	**	9.4	7.2	7.7
Leisure/Personal Interest	52.0	**	**	51.7	56.5	**	**	47.9	**	57.1	52.9	52.6
Other Reason	4.7	**	**	2.7	0.0	**	**	4.7	**	5.6	6.6	3.4
School-Related Costs												
Employer Paid Costs	45.0	**	**	51.5	51.7	**	**	40.7	**	48.4	34.0	55.2
Employer Did Not Pay Cost	55.0	**	**	48.5	48.3	**	**	59.3	**	51.6	66.0	44.8
Degree/Certificate Status												
Completed Degree/Certificate	15.8	**	**	17.0	11.7	**	**	20.3	**	12.7	11.7	17.5
Did Not Complete Degree/Certificate	84.2	**	**	83.0	88.3	**	**	79.7	**	87.3	88.3	82.5

NOTE: Numbers are rounded to the nearest hundred; therefore, subcategories may not add to total.
*Percentages may total more than 100 because multiple answers were allowed.
**Too few cases to estimate.
SOURCE: National Research Council/National Science Foundation, Survey of Doctorate Recipients, 1995.

APPENDIX A

1995 SURVEY METHODOLOGY

The data on doctoral scientists and engineers contained in this report come from the 1995 Survey of Doctorate Recipients (SDR). The National Research Council (NRC) has conducted the SDR biennially since 1973 for the National Science Foundation (NSF). Additional data on education and demographic information come from the National Research Council's Doctorate Records File (DRF). The DRF contains data from an ongoing census of research doctorates earned in the United States since 1920. This appendix contains an overview of the survey methodology; a more detailed description is available under separate cover.[1]

Sample Design

The sampling frame for the SDR is compiled from the DRF. For the 1995 survey the sampling frame comprised individuals who:

- had earned a doctoral degree from a U.S. college or university in a science or engineering field;
- were U.S. citizens or, if non-U.S. citizens, indicated that they had plans to remain in the United States after degree award; and
- were under 76 years of age.

To develop the frame, graduates who had earned their degrees since 1995 and met the conditions listed above were added to the frame; those who were carried over from 1993 but had attained the age of 76 (or had died) were deleted. A sample of the incoming graduates was drawn and added to the panel sample conveyed from year to year. A maintenance cut was done to keep the sample size roughly the same as it was in 1993. In 1995, the SDR sample size was 49,829.

The basic sample design was a stratified random sample with the goal of proportional sampling across strata. The variables used for stratification were 15 broad fields of degree, 2 genders, and an 8-category "group" variable combining race/ethnicity, handicap status, and citizenship status.

In determining sampling rates the goal was to achieve as much homogeneity as possible while allowing for oversampling of certain small populations (e.g., minority women). In practice, however, the goal of proportional sampling was not consistently achieved. A number of sample size adjustments over the years, in combination with changes to the stratification, led to highly variable sampling rates, sometimes within the same sampling cell. The overall sampling rate was about 1 in 12 (8 percent), applied to a

[1] Brown, Prudence, 1997, *Methodological Report of the 1995 Survey of Doctorate Recipients*, National Research Council, Washington, DC.

population of 594,300. Across strata, however, the rates ranged from 4 to 67 percent. The range in sampling rates serves to increase the variance of the survey estimates.

Data Collection

In 1995, there were two phases of data collection: a mail survey and telephone follow-up interview for nonrespondents to the mail. Phase 1 consisted of two mailings of the survey questionnaire with a reminder postcard between the mailings. The first mailing was in May 1995 and the second (using Priority Mail) in July 1995. To encourage participation, all survey materials were personalized with the respondent's name and address. The mail survey achieved a response rate of about 62 percent.

Phase 2 consisted of conducting computer-assisted telephone interviewing (CATI) on a 60-percent sample of nonrespondents to the mail survey (the CATI subsample). Telephone numbers were located for about 90 percent of the subsample and interviews were completed with 63 percent. Telephone interviewing was conducted between November 1995 and February 1996.

Data Preparation

As completed mail questionnaires were received, they were logged into a receipt control system that kept track of the status of all cases. Coding staff then carried out a variety of checks and prepared the questionnaires for data entry. Specifically, they resolved incomplete or contradictory answers, reviewed "other specify" responses for possible backcoding to a listed response, and assigned numeric codes to open-ended questions (e.g., employer name). A coding supervisor validated the coders' work.

Once cases were coded, they were sent to data entry. The data entry program contained a full complement of range and consistency checks for entry errors and inconsistent answers. The range and consistency checks were also applied to the CATI data via batch processing. Further computer checks were performed to test for inconsistent values; these were corrected and the process repeated until no inconsistencies remained.

At this point, the survey data file was ready for imputation of missing data. As a first step, basic frequency distributions were produced to show nonresponse rates to each question—these were generally less than 3 percent, with the exception of salary, which was 6 percent. Two methods for imputation were adopted. The first, cold decking, was used mainly for demographic variables that are static, i.e., not subject to change. Using this method, historical data provided by respondents in previous years were used to fill a missing response. In cases where no historical data were available, and for non-demographic variables (such as employment status, primary work activity, and salary), hot decking was used. Hot decking involved creating cells of cases with common characteristics (through the cross-classification of auxiliary variables) and then selecting a donor at random for the case with the missing value. As a general rule, no data value was imputed from a donor in one cell to a recipient in another cell.

Weighting and Estimation

The next phase of the survey process involved weighting the survey data to compensate for unequal probabilities of selection to the sample and to adjust for the effects of unit nonresponse. The first step was the construction of sample weights, which were calculated as the inverse of the probability of selection, taking into account all stages of the sample selection process over time. Sample weights varied within cells because different sampling rates were used depending on the year of selection and the stratification in effect at that time.

The second step was to construct a combined weight, which took into account the subsampling of nonrespondents at the CATI phase. All respondents received a combined weight, which for mail respondents was equal to the sample weight and for CATI respondents was a combination of their sample weight and their CATI subsample weight.

The third step was to adjust the combined weights for unit nonresponse. (Unit nonresponse occurs when the sample member refuses to participate or cannot be located.) Nonresponse adjustment cells were created using poststratification. Within each nonresponse adjustment cell, a weighted nonresponse rate was calculated. This weighted nonresponse rate took into account both mail and CATI nonresponse. The nonresponse adjustment factor was the inverse of this weighted response rate. The initial set of nonresponse adjustment factors was examined and, under certain conditions, some of the cells were collapsed if use of the adjustment factor would create excessive variance.

The final weights for respondents were calculated by multiplying their respective combined weights by the nonresponse adjustment factor. Estimates in this report were developed by summing the final weights of the respondents selected for each analysis.

Response Rates

The unweighted response rate, which is calculated as total returns divided by total sample, was 76 percent. The weighted response rate takes into account the different probabilities for selection to the sample and the CATI subsample and is calculated as the total returns multiplied by their combined weight divided by the total sample cases multiplied by their sampling weights. The weighted response rate was 85 percent. The unweighted response rate is a measure of how well the data collection methodology worked in obtaining responses, while the weighted response rate is an indicator of the potential for nonresponse bias and as such is a somewhat better indicator of data quality.

Reliability

The statistics in this report are subject to both sampling and nonsampling error. For a detailed discussion of both sources of error in the SDR, see the methodological report referenced in footnote 1 of this appendix. In this methodological report, tables are provided that allow the reader to approximate the standard error associated with various estimates from the survey.

APPENDIX B

1995 SURVEY COVER LETTERS AND QUESTIONNAIRE

1995 S&E Advance Letter on NSF Office of the Director Letterhead

May 10, 1995

Dr. John Respondent
132 Elm St.
Maplewood, PA 15324

Dear Dr. Respondent:

In a few days, Dr. Bruce Alberts, Chairman of the National Research Council, will ask you to help with the 1995 Survey of Doctorate Recipients.

Since 1973, we have sponsored this important biennial survey of people who earned doctorates in the United States. It helps government, businesses, and academic institutions do a better job of ensuring sufficient numbers of highly educated personnel in a variety of fields. We have asked the National Research Council to conduct this survey for us to take advantage of their experience in issues involving human resources. The letter from Dr. Alberts will explain more about this survey and our reasons for contacting you.

I would greatly appreciate your participation in this important effort.

Sincerely,

Neal Lane
Director

NATIONAL RESEARCH COUNCIL LETTERHEAD
SCIENTISTS & ENGINEERS WAVE 1 LETTER

May 17, 1995

Dr. John Respondent
132 Elm St.
Maplewood, PA 15324

Dear Dr. Respondent:

I am writing to ask for your help with the 1995 Survey of Doctorate Recipients. This is an important biennial study of highly educated and trained persons, sponsored by the National Science Foundation, the National Institutes of Health, the Department of Energy, and conducted by the National Research Council.

You have been chosen for this study as part of a scientifically selected sample of individuals holding doctoral degrees. Your response is needed whether or not you are employed, living in the United States, or working in your field of degree.

The results of this study will be used by government and academic institutions to make decisions in such areas as graduate student support and R&D funding; to anticipate surpluses or shortages in personnel; and to study the relationship between graduate education and career outcomes. Results from earlier studies have been used to identify trends in faculty composition, in time spent teaching and doing research, and in characteristics of academic and nonacademic employment.

Please complete the enclosed survey form and return it in the postage-paid envelope as soon as possible. The information you provide is voluntary and will be kept strictly confidential. Findings will be reported only in the form of statistical summaries.

If you have any questions about the survey, please call 1-(800)-248-8649 between 9:00 a.m. and 5:00 p.m. Eastern Daylight Time. We would be happy to talk with you.

Thank you for your help. We look forward to receiving your questionnaire.

Sincerely,

Bruce Alberts
Chairman

Enclosure

May 1995

A few days ago, we sent you a questionnaire for the 1995 Survey of Doctorate Recipients.

If you have already completed and returned it, we thank you very much. The survey will help the federal government and others to ensure a sufficient supply of personnel trained to the doctoral level in a variety of fields. The information you provide is very important to the accuracy and success of the survey.

If you have not yet had time to complete the questionnaire, please do so as soon as possible. If you need another copy of the questionnaire, please call toll free between 9 a.m. and 5 p.m., EDT, on 1-(800)-248-8649.

Sincerely,

Susan B. Mitchell
Project Director

NATIONAL RESEARCH COUNCIL LETTERHEAD
SCIENCE & ENGINEERING WAVE 2 LETTER

July 12, 1995

Dr. John Respondent
132 Elm St.
Maplewood, PA 15324

Dear Dr. Respondent:

About 6 weeks ago, we asked you to participate in a nationwide survey of doctorate recipients sponsored by the National Science Foundation.

To the best of my knowledge, we have not yet received your completed Survey of Doctorate Recipients questionnaire. In case you did not receive the questionnaire or have misplaced it, we are enclosing a replacement copy. We are writing to you again to stress the significance that your response has for the overall accuracy of the results and the usefulness of the survey.

We know that the experiences of people with doctoral degrees vary. To understand these differences, we need your response even if you are retired, not working, or working in a field not related to your doctoral degree.

The survey provides timely information for businesses, government, and educational institutions. It helps these groups understand where and in what fields doctorate recipients work and where we should place priorities in a time of limited resources.

We want to assure you that federal law requires us to keep your answers confidential. We cannot release information that allows identification of any individual's answers.

We would be happy to talk to you about any questions or concerns you might have about the survey. Please feel free to call a member of my staff toll free between 9 a.m. and 5 p.m., Eastern Daylight Time, on 1-(800)-248-8649 (or 334-3152 if calling from Washington, D.C.).

Sincerely,

Susan Mitchell
Project Director

Enclosure

1995

We solicit this information under the authority of the National Science Foundation Act of 1950, as amended. Your response is entirely voluntary and failure to provide some or all of the requested information will not in any way adversely affect you. Actual time to complete the questionnaire may vary depending on your circumstances. On the average, it will take about 25 minutes to complete the questionnaire. If you have any comments on the time required for this survey, please send them to Herman Fleming, Division of Contracts, Policy and Oversight, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230; or to the Office of Information and Regulatory Affairs, Office of Management and Budget Paperwork Reduction Project 3145-0020, Washington, DC 20503.

SURVEY OF DOCTORATE RECIPIENTS

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL FOR THE NATIONAL SCIENCE FOUNDATION

OMB NO: 3145-0020
APPROVAL EXPIRES: 3/31/97

INSTRUCTIONS

Thank you for taking the time to complete this questionnaire. Directions for filling it out are provided with each question. Because not all questions will apply to everyone, you may be asked to skip certain questions.

- In order to get comparable data, we will be asking you to refer to the week of April 15, 1995 (e.g., April 9-15, 1995), when answering most questions.
- Follow all "SKIP" instructions AFTER marking a box. If no "SKIP" instruction is provided, you should continue to the NEXT question.
- Either a pen or pencil may be used.
- When answering questions that require marking a box, please use an "X".
- If you need to change an answer, please make sure that your old answer is either completely erased or clearly crossed out.

Thanks again for your help, we really appreciate it.

PART A - Employment Status During the Week of April 15, 1995

A1. Were you working for pay (or profit) during the week of April 15, 1995? This includes a postdoctoral appointment, being self-employed or temporarily absent from a job (e.g., illness, vacation, or parental leave), even if unpaid.

1 ☐ Yes → *SKIP to A7, page 2*
2 ☐ No

A2. *(IF NO)* **Did you look for work at any time during the four weeks preceding April 15, 1995 (that is, any time between March 19 and April 15, 1995)?**

1 ☐ Yes
2 ☐ No

A3. What were your reasons for not working during the week of April 15?

Mark (X) all that apply Year Retired

1 ☐ Retired → 19 __|__
2 ☐ On layoff from a job
3 ☐ Student
4 ☐ Family responsibilities
5 ☐ Chronic illness or permanent disability
6 ☐ Suitable job not available
7 ☐ Did not need or want to work
8 ☐ Other - *Specify*

____

____

A4. Prior to the week of April 15, 1995, when did you last work for pay (or profit)?

If never worked for pay (or profit) mark (X) in this box → ☐ *and SKIP to Part D, page 13*

	Month	Year
LAST WORKED:	__|__	**19** __|__

A5. What kind of work were you doing on this last job--that is, what was your occupation? *Please be as specific as possible, including any area of specialization.*

Example: College Professor - Electrical Engineering

____

____

____

A6. Using the JOB CATEGORIES LIST (pages 16-17), choose the code that BEST describes the work you were doing on this last job.

CODE

__|__|__ → *SKIP to A49, page 8*

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A7. *(IF WORKED DURING WEEK OF APRIL 15TH)* **Counting *all* jobs held during the week of April 15, 1995, did you USUALLY work ...**

1 ☐ A total of 35 or more hours per week → *SKIP to A10*

2 ☐ Fewer than 35 hours per week

A8. *(IF FEWER THAN 35 HOURS)* **During the week of April 15, did you want to work a full-time work week of 35 or more hours?**

1 ☐ Yes

2 ☐ No

A9. **What were your reasons for working a part-time work week (i.e., less than 35 hours) the week of April 15?**

Mark (X) all that apply

Year

1 ☐ Retired or semi-retired→**19** ___

2 ☐ Student

3 ☐ Family responsibilities

4 ☐ Chronic illness or permanent disability

5 ☐ Suitable full-time work week job not available

6 ☐ Did not need or want to work full-time

7 ☐ Other - *Specify*

____

____

SKIP to A11

A10. *(IF 35 OR MORE HOURS)* **Although you were working during the week of April 15, had you previously RETIRED from any position?**

Examples of retirement include mandatory retirement, early retirement, or voluntary retirement

1 ☐ Yes → **19** ___ Year Retired

2 ☐ No

Please answer the next series of questions for your PRINCIPAL job held during the week of April 15, 1995. A second job, if held, will be covered later.

A11. **Who was your principal employer during the week of April 15, 1995?**

IF MORE THAN ONE JOB: Record employer for whom you worked the most hours that week

IF EMPLOYER HAD MORE THAN ONE LOCATION: Record location where you usually worked

Employer Name

____

City/Town

____

State/Foreign Country

____

Zip Code

____

A12. **Counting all locations where this employer operates, how many people work for your principal employer? Your best estimate is fine.**

Mark (X) one

1 ☐ Under 10 employees

2 ☐ 10-24 employees

3 ☐ 25 to 99 employees

4 ☐ 100-499 employees

5 ☐ 500-999 employees

6 ☐ 1,000-4,999 employees

7 ☐ 5,000+ employees

142

A13. Was your principal employer during the week of April 15 . . .

IF EMPLOYER WAS A SCHOOL: Mark (X) the type of organizational charter (e.g., mark "State government" for state schools, most private schools are "private not-for-profit")

Mark (X) one

1 ☐ A PRIVATE-FOR-PROFIT company, business or individual, working for wages, salary or commissions

2 ☐ A PRIVATE NOT-FOR-PROFIT, tax-exempt, or charitable organization

3 ☐ SELF-EMPLOYED in own NOT INCORPORATED business, professional practice, or farm

4 ☐ SELF-EMPLOYED in own INCORPORATED business, professional practice, or farm

5 ☐ Local GOVERNMENT (city, county, etc.)

6 ☐ State GOVERNMENT

7 ☐ U.S. military service, active duty or Commissioned Corps (e.g., USPHS, NOAA)

8 ☐ U.S. GOVERNMENT (civilian employee)

9 ☐ Other - *Specify* →

____

A14. Was your principal employer an educational institution?

1 ☐ Yes

2 ☐ No → *SKIP to A18*

A15. *(IF EDUCATIONAL INSTITUTION)* **Was this educational institution...**

Mark (X) one

1 ☐ A preschool, elementary, or middle school or system → *SKIP to A18*

2 ☐ A secondary school or system → *SKIP to A18*

3 ☐ A 2-year college, junior college, or technical institute

4 ☐ A 4-year college or university, other than a medical school

5 ☐ A medical school (including university-affiliated hospital or medical center)

6 ☐ A university-affiliated research institute

7 ☐ Other - *Specify* →

____

A16. What was your faculty rank?

Mark (X) one

1 ☐ Not applicable at this institution

2 ☐ Not applicable for my position

3 ☐ Professor

4 ☐ Associate Professor

5 ☐ Assistant Professor

6 ☐ Instructor

7 ☐ Lecturer

8 ☐ Adjunct Faculty

9 ☐ Other - *Specify* →

____

A17. What was your tenure status?

Mark (X) one

1 ☐ Not applicable: no tenure system at this institution

2 ☐ Not applicable: no tenure system for my position

3 ☐ Tenured

4 ☐ On tenure track but not tenured

5 ☐ Not on tenure track

A18. What kind of work were you doing on your principal job held during the week of April 15, 1995--that is, what was your occupation? *Please be as specific as possible, including any area of specialization.*

Example: College Professor - Electrical engineering

____

____

A19. Using the JOB CATEGORIES LIST (pages 16-17), choose the code that BEST describes the work you were doing on your principal job during the week of April 15.

CODE

|__|__|

A20. Did you record job code "141" (manager, executive, or administrator) in A19?

1 ☐ Yes
2 ☐ No → *SKIP to A22*

A21. *(IF YES)* **Did your duties on this job require the technical expertise of a bachelor's degree or higher in -**

Mark (X) Yes or No for each

	Yes	No
1. Engineering, computer science, math or the natural sciences	1 ☐	2 ☐
2. The social sciences	1 ☐	2 ☐
3. Some other field (for example, health or business) - *Specify*	1 ☐	2 ☐

____

A22. During what month and year did you start this job (that is, your principal job held during the week of April 15, 1995)?

JOB STARTED ___|___ (Month) **19** ___|___ (Year)

A23. As of the week of April 15, were you licensed or certified in your occupation?

Do NOT include academic degrees (e.g., BA, MA, PhD)

1 ☐ Yes
2 ☐ No

A24. Thinking about the relationship between your work and your education, to what extent was your work on your principal job held during the week of April 15 related to your first doctoral degree awarded in the U.S.? Was it . . .

Mark (X) one

1 ☐ Closely related → *SKIP to A27, page 5*
2 ☐ Somewhat related → *SKIP to A27, page 5*
3 ☐ Not related

A25. *(IF NOT RELATED)* **Did these factors influence your decision to work in an area OUTSIDE THE FIELD OF YOUR FIRST U.S. DOCTORAL DEGREE?**

Mark (X) Yes or No for each

	Yes	No
1. Pay, promotion opportunities	1 ☐	2 ☐
2. Working conditions (hours, equipment, working environment)	1 ☐	2 ☐
3. Job location	1 ☐	2 ☐
4. Change in career or professional interests	1 ☐	2 ☐
5. Family-related reasons (children, spouse's job moved)	1 ☐	2 ☐
6. Job in doctoral degree field not available	1 ☐	2 ☐
7. Other reason - *Specify*	1 ☐	2 ☐

____

A26. Which TWO factors in A25 represent your MOST important reasons for working in an area outside the field of your first U.S. doctoral degree? *Enter number of appropriate REASONS from A25 above.*

1. ________ MOST important reason

2. ________ SECOND MOST important reason (Enter "0" if no second most)

A27. The next question is about your work activities on your principal job. Which of the following work activities occupied 10 percent or more of your time during a TYPICAL work week on this job?

Mark (X) Yes or No for each

	Yes	No
1. Accounting, finance, contracts	1 ☐	2 ☐
2. Applied research - study directed toward gaining scientific knowledge to meet a recognized need	1 ☐	2 ☐
3. Basic research - study directed toward gaining scientific knowledge primarily for its own sake	1 ☐	2 ☐
4. Computer applications, programming, systems development	1 ☐	2 ☐
5. Development - using knowledge gained from research for the production of materials, devices	1 ☐	2 ☐
6. Design of equipment, processes, structures, models	1 ☐	2 ☐
7. Employee relations - including recruiting, personnel development, training	1 ☐	2 ☐
8. Managing and supervising	1 ☐	2 ☐
9. Production, operations, maintenance (e.g., truck driving, machine tooling, auto/machine repairing)	1 ☐	2 ☐
10. Professional services (health care, counseling, financial services, legal services, etc.)	1 ☐	2 ☐
11. Sales, purchasing, marketing, customer service, public relations	1 ☐	2 ☐
12. Quality or productivity management	1 ☐	2 ☐
13. Teaching	1 ☐	2 ☐
14. Other - *Specify* ↓	1 ☐	2 ☐

____

A28. On which TWO activities in A27, did you work the MOST hours during a typical week on this job? *Enter number of appropriate ACTIVITY from A27 above.*

1. ____ Activity MOST hours
2. ____ Activity SECOND MOST hours (Enter "0" if no second most)

A29. In A28, did you record "2" or "3" or "5" or "6" (applied/basic research or development/ design)?

1 ☐ Yes
2 ☐ No → *Skip to A31*

A30. *(IF YES)* **In what field was your research-related work being conducted?**

Field: ______________________________

____

A31. During a typical week on this job, in which, if any, of the following areas or technologies, were you working?

Mark (X) Yes or No for each

	Yes	No
1. Flexible manufacturing, robotics	1 ☐	2 ☐
2. Advanced materials	1 ☐	2 ☐
3. Biotechnology	1 ☐	2 ☐
4. Micro or opto-electronics, Semiconductor devices	1 ☐	2 ☐
5. High performance computing	1 ☐	2 ☐
6. Software producibility	1 ☐	2 ☐
7. Sensor and signal processing	1 ☐	2 ☐

A32. Since April 1990, how many ...

If NONE, enter "0"

	Number
1. Papers have you authored or co-authored for presentation at regional, national or international conferences? (Do not count presentations of the same work more than once)	______
2. Articles that you have authored or co-authored have been accepted for publication in a refereed professional journal?	______

A33. Since April 1990, have you been named as an inventor on any application for a U.S. patent?

1 ☐ Yes
2 ☐ No → *SKIP to A35*

A34. *(IF YES)* **Since April 1990 . . .**

	Number
1. How many applications for U.S. patents have named you as inventor?	________
2. How many U.S. patents have been granted to you as an inventor?	________
3. How many of the patents recorded as GRANTED (recorded in category 2 above) have resulted in commercialized products or processes or have been licensed?	________

A35. Did you supervise the work of others as part of your principal job held during the week of April 15, 1995?

Answer "YES" if you assigned duties to workers AND recommended or initiated personnel actions such as hiring, firing, or promoting

TEACHERS: Do NOT count students

1 ☐ Yes
2 ☐ No → *SKIP to A37*

A36. *(IF YES)* **How many people did you typically...**

IF NONE, enter "0"

	Number supervised
1. supervise DIRECTLY? ..	________
2. supervise through subordinate supervisors?	________

A37. Before deductions, what was your basic ANNUAL salary on this job as of the week of April 15, 1995? (Do NOT include bonuses, overtime, or additional compensation for summertime teaching or research)

IF NOT SALARIED, please estimate your earned income, excluding business expenses.

$ ______________________ **.00**

Basic Annual Salary/Earned Income

A38. During a typical week on this job, how many hours did you usually work?

Number of Hours Per Week ________

A39. Including paid vacation and paid sick leave, upon how many weeks per year was your salary based?

Number of Weeks Per Year ________

A40. During the week of April 15, 1995, was any of your work on this job supported by CONTRACTS OR GRANTS from the U.S. government?

FEDERAL EMPLOYEES, please answer "No"

Mark (X) one

1 ☐ Yes
2 ☐ No → *SKIP to A42, page 7*
3 ☐ Don't know → *SKIP to A42, page 7*

A41. *(IF YES)* **Which Federal agencies or departments were supporting your work?**

Mark (X) all that apply

1 ☐ Agency for International Development (AID)
2 ☐ Agriculture Department
3 ☐ Commerce Department
4 ☐ Defense Department (DOD)
5 ☐ Department of Education (include NCES, OERI, FIPSE, FIRST)
6 ☐ Energy Department (DOE)
7 ☐ Environmental Protection Agency (EPA)
8 ☐ Health and Human Services Department (EXCLUDING NIH)
9 ☐ Interior Department
10 ☐ National Aeronautics and Space Administration (NASA)
11 ☐ National Institutes of Health (NIH)
12 ☐ National Science Foundation (NSF)
13 ☐ Transportation Department (DOT)
14 ☐ Other - *Specify* ________________
15 ☐ DON'T KNOW SOURCE AGENCY

The following 3 questions provide information for the U.S. Department of Energy

A42. From the following list of selected areas, indicate the ONE area, if any, to which you devoted the MOST hours during a typical week on this job.

Mark (X) one

1 ☐ Energy or Fuel
2 ☐ Environment → *SKIP to A45*
3 ☐ Food or Agriculture → *SKIP to A45*
4 ☐ Health or Safety → *SKIP to A45*
5 ☐ National Defense → *SKIP to A45*
6 ☐ Transportation → *SKIP to A45*
7 ☐ NONE OF THE ABOVE → *SKIP to A45*

A43. *(IF ENERGY OR FUEL)* **From the following list, indicate the ONE ENERGY SOURCE that involved the largest proportion of your energy-related work during the past year.**

Mark (X) one

1 ☐ Coal
2 ☐ Petroleum and natural gas
3 ☐ Nuclear fission
4 ☐ Nuclear fusion
5 ☐ Hydroenergy
6 ☐ Other renewables (such as solar, biomass, wind, geothermal)
7 ☐ Other energy source - *Specify*

____

A44. From the following list, indicate the ONE ENERGY-RELATED ACTIVITY that involved the largest proportion of your energy-related work during the past year.

Mark (X) one

1 ☐ Exploration and extraction
2 ☐ Manufacture of energy-related equipment
3 ☐ Fuel processing (include refining and enriching)
4 ☐ Electric power generation and transmission
5 ☐ Transportation and distribution of fuel
6 ☐ Waste management or decommissioning
7 ☐ Conservation, utilization, management or storage of energy or fuel
8 ☐ Environment, health, and safety
9 ☐ Other energy-related activity - *Specify*

____

A45. During the week of April 15, 1995, were you working for pay (or profit) at a second job (or business), including part-time, evening, or weekend work?

1 ☐ Yes
2 ☐ No → *SKIP to A49, page 8*

A46. *(IF YES)* **What kind of work were you doing at your second job during the week of April 15--that is, what was your occupation?** *Please be as specific as possible, including any area of specialization.*

Example: College professor - Electrical engineering

IF YOU HAD MORE THAN TWO JOBS that week answer for the job where you worked the second most hours

____

____

A47. Using the JOB CATEGORIES LIST (pages 16-17) choose the code that BEST describes the work you were doing on your second job during the week of April 15.

CODE __|__|__

A48. To what extent was your work on this second job related to your first doctoral degree awarded in the U.S.? Was it -

Mark (X) one

1 ☐ Closely related
2 ☐ Somewhat related
3 ☐ Not related

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Questions A49-A51 ask about your work for pay (or profit) in 1994

A49. Turning now to 1994, including paid vacation and paid sick leave, how many weeks did you work in 1994?

IF NONE, MARK (X) THIS BOX → ☐ AND SKIP TO B1

Number of Weeks Worked ______

A50. During the weeks you worked in 1994, how many hours a week did you usually work?

Number of Hours Worked ______

A51. Counting all jobs held, what was your TOTAL EARNED income, BEFORE deductions, for 1994?

Include all wages, salaries, bonuses, overtime, commissions, consulting fees, net income from business, summertime teaching or research, post doctoral appointment, or other work associated with scholarships.

$ ______ .00

Total 1994 Earned Income

IF YOU HAD NO EARNED INCOME IN 1994, MARK (X) THIS BOX → ☐

PART B - Past Employment

The next few questions will help us better understand employment changes over time.

B1. Were you working for pay (or profit) during BOTH of these time periods--the week of April 15, 1993 AND the week of April 15, 1995?

If you were a STUDENT: Do NOT count financial aid awards with no work requirement.

1 ☐ Yes

2 ☐ No → *SKIP to Part C, page 9*

B2. *(IF YES)* **During these two time periods--the week of April 15, 1993 and the week of April 15, 1995--were you working for . . .**

Mark (X) one

1 ☐ Same employer AND same job → *SKIP to Part C, page 9*

2 ☐ Same employer BUT different job

3 ☐ Different employer BUT same job

4 ☐ Different employer AND different job

B3. *(IF DIFFERENT)* **Why did you change your employer or your job?**

Mark (X) Yes or No for each

	Yes	No
1. Pay, promotion opportunities	1 ☐	2 ☐
2. Working conditions (hours, equipment, working environment)	1 ☐	2 ☐
3. Job location	1 ☐	2 ☐
4. Change in career or professional interests	1 ☐	2 ☐
5. Family-related reasons (e.g., children, spouse's job moved)	1 ☐	2 ☐
6. School-related reasons (e.g., returned to school, completed a degree)	1 ☐	2 ☐
7. Laid off or job terminated (includes company closings, mergers, buyouts)	1 ☐	2 ☐
8. Retired	1 ☐	2 ☐
9. Other - *Specify*	1 ☐	2 ☐

______

______

PART C - Other Work Related Information

The next few questions ask about your work experience since completing your (first) doctoral degree.

C1. Please review the JOB CATEGORIES LIST on pages 16-17. Using that list, please record codes in Column 1 for those job categories where you have had ONE OR MORE YEARS OF WORK EXPERIENCE since completing your (first) doctoral degree (a single job category code can represent several jobs). Next, complete Columns 2-5 for each job category recorded in Column 1.

Example: Chris was a regional sales director for a computer hardware company between 1980 and 1986. In 1986 she was offered a job teaching marketing at a local college, something she had always wanted to try and that would allow more time with her family. Between 1986 and 1995, she had taught at three different colleges. Chris would enter:

Row	Col 1	Col 2	Col 3	Col 4	Col 5
First	141	*Sales Director, computer hardware company*	1980 and 1986	6 years	3, 4
Second	274	*Professor - Marketing*	1986 and 1995	9 years	9

WORK EXPERIENCE SINCE (FIRST) DOCTORAL DEGREE

Col 1 Job Category Codes (pages 16-17) *Group jobs by job category codes, only use a job category code ONCE* *If more than 3 job category codes apply: Pick the 3 where you have worked the longest*	**Col 2 Brief Description of Work Done**	**Col 3 Starting and Ending Dates** *Working continually in the same job category between the two dates is not necessary*	**Col 4 Total Years of Work Experience** *Estimate using full-time equivalency (FTE)*	**Col 5 Two Most Important Reasons for Leaving** *Write appropriate numbers from the "Reasons for Leaving" box below*
CODE 1 ___ ___		FROM 19 ___ TO 19 ___	___ Year(s)	☐ Most important ☐ 2nd Most important (Specify for category 10) ______
CODE 2 ___ ___		FROM 19 ___ TO 19 ___	___ Year(s)	☐ Most important ☐ 2nd Most important (Specify for category 10) ______
CODE 3 ___ ___		FROM 19 ___ TO 19 ___	___ Year(s)	☐ Most important ☐ 2nd Most important (Specify for category 10) ______

REASONS FOR LEAVING (for use in Column 5 above)

1. Pay, promotion, benefits
2. Working conditions (hours, equipment, working environment)
3. Change in career/professional interests
4. Family (children, spouse's job moved)
5. School (completed degree, returned to school, etc.)
6. Did not enjoy the work
7. Job ended/suitable job in my field not available
8. Retired
9. Still working in that field
10. Other - Specify above

C2. Since completing your (first) doctoral degree, have you had any periods of 6 months or more where you were not working?

1 ☐ Yes
2 ☐ No → *SKIP to C4*

C3. *(IF YES)* **Please provide the following information for each period of 6 months or longer. Your best guess is fine.**

DATES NOT WORKING				REASONS FOR NOT WORKING - *Mark (X) all that apply*							
FROM		TO									
Month	Year	Month	Year	Retired	Layoff/Job Ended (Company Closed)	Full-Time Student Not Working	Family Responsibilities	Chronic Illness or Permanent Disability	Suitable Job Not Available	Did Not Need or Want to Work	Other
1 __|__	19__|__	__|__	19__|__	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐
2 __|__	19__|__	__|__	19__|__	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐
3 __|__	19__|__	__|__	19__|__	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐

C4. How much would (or does) your work benefit from each of the following?

Mark (X) one for each

	A Great Deal	Some-what	Not At All
1. Long distance communications with colleagues outside the U.S. (e.g., by letter, telephone, e-mail, fax, etc.)	1 ☐	2 ☐	3 ☐
2. Short-term visits to non-U.S. locations (days or weeks in duration)	1 ☐	2 ☐	3 ☐
3. Long-term visits to non-U.S. locations (6-months to 1 or 2 years in duration)	1 ☐	2 ☐	3 ☐

C5. Since completing your doctorate, have you ever traveled outside the United States to work or conduct research in your field?

DO NOT include international conferences.

1 ☐ Yes → *Go to C6*
2 ☐ No → *SKIP to C7*

C6. *(IF YES)* **How long was your last trip outside the United States to work or conduct research?**

1 ☐ Less than 7 days
2 ☐ 7 to 30 days
3 ☐ 1 to 6 months
4 ☐ More than 6 months

→ *SKIP to C8, page 11*

C7. *(IF NO)* **Why haven't you worked or conducted research outside the United States?**

Mark (X) all that apply

1 ☐ Not relevant to my career
2 ☐ No interest
3 ☐ No time
4 ☐ Unable to identify host institution
5 ☐ Concerned about losing my place in U.S. job market
6 ☐ Unaware of funding sources
7 ☐ Lack of foreign language skills
8 ☐ Family-related reasons
9 ☐ Other - *Specify:*

____

C8. Since completing your (first) doctoral degree how many "postdocs," if any, have you held? A "postdoc" (postdoctoral appointment) is a temporary position awarded in academe, industry, or government primarily for gaining additional education and training in research.

NUMBER ________

OR IF NONE, MARK THIS BOX → ☐ *AND SKIP to C12*

C9. Please provide the following information for each postdoc recorded in C8. Please include any postdocs you might currently hold.

MOST RECENT OR CURRENT POSTDOC	SECOND MOST RECENT POSTDOC	THIRD MOST RECENT POSTDOC
A. Date postdoc started and ended (or you left) IF CURRENTLY IN POSTDOC: Enter "00" for year ended	**A. Date postdoc started and ended (or you left)**	**A. Date postdoc started and ended (or you left)**
Month / Year **Started:** __|__ **19** __|__ **Ended:** __|__ **19** __|__	Month / Year **Started:** __|__ **19** __|__ **Ended:** __|__ **19** __|__	Month / Year **Started:** __|__ **19** __|__ **Ended:** __|__ **19** __|__
B. What was your primary reason for taking this postdoc? *Mark (X) one* 1 ☐ Additional training in PhD field 2 ☐ Training in an area outside of PhD field 3 ☐ Work with a specific person or place 4 ☐ Other employment not available 5 ☐ Other - *Specify* ________	**B. What was your primary reason for taking this postdoc?** *Mark (X) one* 1 ☐ Additional training in PhD field 2 ☐ Training in an area outside of PhD field 3 ☐ Work with a specific person or place 4 ☐ Other employment not available 5 ☐ Other - *Specify* ________	**B. What was your primary reason for taking this postdoc?** *Mark (X) one* 1 ☐ Additional training in PhD field 2 ☐ Training in an area outside of PhD field 3 ☐ Work with a specific person or place 4 ☐ Other employment not available 5 ☐ Other - *Specify* ________
C. In what field were you working? Please be as specific as possible. ________	**C. In what field were you working? Please be as specific as possible.** ________	**C. In what field were you working? Please be as specific as possible.** ________
D. What sector BEST describes where you worked . . . Mark (X) one 1 ☐ Educational Institution 2 ☐ Business/Industry 3 ☐ Government (any level) 4 ☐ Other - *Specify* ________	**D. What sector BEST describes where you worked . . .** Mark (X) one 1 ☐ Educational Institution 2 ☐ Business/Industry 3 ☐ Government (any level) 4 ☐ Other - *Specify* ________	**D. What sector BEST describes where you worked . . .** Mark (X) one 1 ☐ Educational Institution 2 ☐ Business/Industry 3 ☐ Government (any level) 4 ☐ Other - *Specify* ________
E. For this postdoc, did you receive . . . Health benefits? ... 1 ☐ Yes 2 ☐ No Pension benefits? . 1 ☐ Yes 2 ☐ No	**E. For this postdoc, did you receive . . .** Health benefits? ... 1 ☐ Yes 2 ☐ No Pension benefits? . 1 ☐ Yes 2 ☐ No	**E. For this postdoc, did you receive . . .** Health benefits? ... 1 ☐ Yes 2 ☐ No Pension benefits? . 1 ☐ Yes 2 ☐ No
F. Was this postdoc the result of winning a national competition? 1 ☐ Yes 2 ☐ No	**F. Was this postdoc the result of winning a national competition?** 1 ☐ Yes 2 ☐ No	**F. Was this postdoc the result of winning a national competition?** 1 ☐ Yes 2 ☐ No

C10. Was your principal job during the week of April 15 a postdoc position?

1 ☐ Yes → *SKIP to C12*

2 ☐ No

C11. How relevant was your (most recent) postdoc to your work on your principal job held during the week of April 15?

IF NOT WORKING FOR PAY OR PROFIT THE WEEK OF APRIL 15: Use your "last job"

Mark (X) one for each

	A Great Deal	Some-what	Not At All
1. Subject matter knowledge or expertise?	1 ☐	2 ☐	3 ☐
2. Use of specific skills or techniques?	1 ☐	2 ☐	3 ☐
3. Contacts established with colleagues in your field?	1 ☐	2 ☐	3 ☐
4. Use of specialized equipment?	1 ☐	2 ☐	3 ☐
5. General approach or problem solving skills?	1 ☐	2 ☐	3 ☐
6. Something else? - *Specify*	1 ☐	2 ☐	3 ☐

C12. During the past year, did you attend any professional society or association meetings or conferences?

Include regional, national, or international meetings

1 ☐ Yes

2 ☐ No

C13. To how many national or international professional societies or associations do you currently belong?

Number

__|__ **OR** ☐ NONE

C14. During the past year, did you attend any WORK-RELATED workshops, seminars, or other work-related training activities?

Do NOT include college courses - these will be discussed in PART D.

Do NOT include professional meetings unless you attended a special training session conducted at the meeting/conference.

1 ☐ Yes → GO to C15

2 ☐ No → *SKIP to Part D, page 13*

C15. *(IF YES)* **During the past year, in which of the following areas did you attend work-related workshops, seminars, or other work-related training activities?**

Mark (X) Yes or No for each

	Yes	No
1. Management or supervisor training	1 ☐	2 ☐
2. Training in your occupational field	1 ☐	2 ☐
3. General professional training (e.g., public speaking, business writing)	1 ☐	2 ☐
4. Other work-related training - *Specify*	1 ☐	2 ☐

C16. For which of the following reasons did you attend training activities during the past year?

Mark (X) Yes or No for each

	Yes	No
1. To facilitate a change in your occupational field	1 ☐	2 ☐
2. To gain FURTHER skills or knowledge in your occupational field	1 ☐	2 ☐
3. For licensure/certification	1 ☐	2 ☐
4. To increase opportunities for promotion/advancement/higher salary	1 ☐	2 ☐
5. To learn skills or knowledge needed for a recently acquired position	1 ☐	2 ☐
6. Required or expected by employer	1 ☐	2 ☐
7. Other - *Specify*	1 ☐	2 ☐

C17. What was your most important reason for attending training activities? *Enter number of appropriate REASON from C16 above*

_____ Most IMPORTANT REASON from C16

PART D - Background Information

D1. Between April 1993 and April 1995, did you take any college or university courses or enroll in a college or university for other reasons, such as completing another Master's or PhD?

1 ☐ Yes

2 ☐ No → *SKIP to D10, page 14*

D2. *(IF YES)* **In which college or university department were you primarily taking classes or doing research, etc., (e.g., English, chemistry)?**

DEPARTMENT: ____________________

D3. Between April 1993 and April 1995, did you complete a degree or certificate?

1 ☐ Yes

2 ☐ No → *SKIP to D7*

D4. *(IF YES)* **In what month and year was this degree or certificate awarded?**

IF YOU COMPLETED MORE THAN ONE: Enter the date for the highest degree or certificate awarded

__|__ 19 __|__
Month Year

D5. What type of degree or certificate did you receive?

IF MORE THAN ONE APPLIES: Mark the highest level

Mark (X) one

1 ☐ Bachelor's degree

2 ☐ Post baccalaureate certificate

3 ☐ Master's degree (including MBA)

4 ☐ Post master's certificate

5 ☐ Doctorate

6 ☐ Other professional degree (e.g., JD, LLB, THD, MD, DDS, etc.)

7 ☐ Other - *Specify*

____

D6. From which academic institution did you receive this degree or certificate?

School name: ____________________

City/Town: ____________________

State/Foreign country: ____________________

D7. What was your primary field of study during that time?

IF NO PRIMARY FIELD OF STUDY, MARK (X) THIS BOX → ☐

Primary Field of Study: ____________________

D8. For which of the following reasons were you taking classes or enrolled between April 1993 and April 1995?

Mark (X) Yes or No for each	Yes	No
1. To gain further education before beginning a career	1 ☐	2 ☐
2. To prepare for graduate school	1 ☐	2 ☐
3. To change your academic or occupational field	1 ☐	2 ☐
4. To gain FURTHER skills or knowledge in your academic or occupational field	1 ☐	2 ☐
5. For licensure/certification	1 ☐	2 ☐
6. To increase opportunities for promotion/advancement/higher salary	1 ☐	2 ☐
7. Required or expected by employer	1 ☐	2 ☐
8. For leisure/personal interest	1 ☐	2 ☐
9. Other- *Specify* ____________________	1 ☐	2 ☐

D9. Were ANY of your school-related costs for taking college or university courses during this time paid by an employer?

1 ☐ Yes

2 ☐ No

D10. As of the week of April 15 were you -

Mark (X) one

1 ☐ Married
2 ☐ Widowed → *SKIP to D13*
3 ☐ Separated → *SKIP to D13*
4 ☐ Divorced → *SKIP to D13*
5 ☐ Never Married → *SKIP to D13*

D11. *(IF MARRIED)* **During the week of April 15, was your spouse working for pay (or profit) at a full-time or part-time job?**

1 ☐ Yes, full-time
2 ☐ Yes, part-time
3 ☐ No → *SKIP to D13*

D12. *(IF YES)* **Did your spouse's duties on this job require the technical expertise of a bachelor's degree or higher in . . .**

Mark (X) Yes or No for each

	Yes	No
1. Engineering, computer science, math, or the natural sciences	1 ☐	2 ☐
2. The social sciences	1 ☐	2 ☐
3. Some other field (e.g., health or business) - *Specify* ...	1 ☐	2 ☐

____

D13. During the week of April 15, did you have any children living with you as part of your family?

Only count children who lived with you at least 50 percent of the time.

1 ☐ Yes → *GO to D14*
2 ☐ No → *SKIP to D15*

D14. *(IF YES)* **How many of these children living with you as part of your family were -**

If no children in a category, enter "0"

	Number of children
1. Under age 2	______
2. Aged 2-5	______
3. Aged 6-11	______
4. Aged 12-17	______
5. Aged 18 or older	______

D15. During the week of April 15, 1995, were you living in the United States or one of its territories or were you living in another country?

1 ☐ United States or one of its territories
2 ☐ Another country

D16. As of the week of April 15, were you a . . .

Mark (X) one

<u>**U.S. Citizen**</u>

1 ☐ Native Born → *SKIP to D18*
2 ☐ Naturalized → *SKIP to D18*

<u>**Non-U.S. Citizen**</u>

1 ☐ With a Permanent U.S. Resident Visa
2 ☐ With a Temporary U.S. Resident Visa
3 ☐ Living outside the United States

D17. *(IF A NON-U.S. CITIZEN)* **Of which country are you a citizen?**

COUNTRY: ____________________

D18. What is your birthdate?

__|__ Month   __|__ Day   19 __|__ Year

The next question is designed to help us better understand the career paths of individuals with different physical abilities.

D19. What is the USUAL degree of difficulty you have with -

MARK (X) ONE FOR EACH

	None	Slight	Moderate	Severe	Unable to Do
1. SEEING words or letters in ordinary newsprint (with glasses/contact lenses if you usually wear them)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. HEARING what is normally said in conversation with another person (with a hearing aid, if you usually wear one)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. WALKING without human or mechanical assistance or using stairs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. LIFTING or carrying something as heavy as 10 pounds, such as a bag of groceries	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

D20. If you answered "none" TO ALL ACTIVITIES in D19, Mark (X) this box → ☐ and SKIP to D22

D21. What is the earliest age at which you FIRST began experiencing ANY difficulties in any of these areas?

AGE: ____ **OR** ☐ SINCE BIRTH

D22. In case we need to clarify some of the information you have provided, please list a phone number (and fax number and email address if applicable) where you can be reached.

Daytime: Area Code ☐☐☐–Number ☐☐☐–☐☐☐☐ Evening: Area Code ☐☐☐–Number ☐☐☐–☐☐☐☐

Fax Number: ☐☐☐–☐☐☐–☐☐☐☐ Email Address

D23. Since we are interested in how education and employment change over time, we may be recontacting you in 1997. To help us contact you, please provide the name, address, and telephone number of a person who is likely to know where you can be reached. DO NOT INCLUDE SOMEONE WHO LIVES IN YOUR HOUSEHOLD.

As with all the information provided in this questionnaire, complete confidentiality will be provided. This person will only be contacted if we have trouble contacting you in 1997.

First Name ____ MI ____ Last Name ____

Number and Street ____

City/town ____ State ____ Zip Code ____

Country (if outside U.S.) ____

☐☐☐–☐☐☐–☐☐☐☐
Area Code Number

D24. PLEASE TURN TO THE BACK COVER FOR THE LAST QUESTION (D25).

JOB CATEGORIES LIST

This list is ordered ALPHABETICALLY. The titles in bold type are broad job categories. To make sure you have found the BEST code, please review ALL broad categories before making your choice. If you cannot find the code that BEST describes your job, use the "OTHER" code under the most appropriate broad category in bold print. If none of the codes fit your job, use Code 500.

010 **Artists, Broadcasters, Editors, Entertainers, Public Relations Specialists, Writers**

Biological/Life Scientists
021 Agricultural and food scientists
022 Biochemists and biophysicists
023 Biological scientists (e.g., botanists, ecologists, zoologists)
024 Forestry, conservation scientists
025 Medical scientists (excluding practitioners)
026 Technologists and technicians in the biological/life sciences
027 OTHER biological/life scientists

Clerical/Administrative Support
031 Accounting clerks, bookkeepers
032 Secretaries, receptionists, typists
033 OTHER administrative (e.g., record clerks, telephone operators)

040 **Clergy and Other Religious Workers**

Computer Occupations
(Also see 173)
*** Computer engineers (See 087, 088 under Engineering)
051 Computer programmers (business, scientific, process control)
052 Computer system analysts
053 Computer scientists, except system analysts
054 Information systems scientists or analysts
055 OTHER computer, information science occupations

*** **Consultants** *(select the code that comes closest to your usual area of consulting)*

070 **Counselors, Educational and Vocational**
(Also see 236)

Engineers, Architects, Surveyors
081 Architects
*** Engineers (Also see 100-103)
- 082 Aeronautical, aerospace, astronautical engineer
- 083 Agricultural engineer
- 084 Bioengineering and biomedical engineer
- 085 Chemical engineer
- 086 Civil, including architectural and sanitary engineer

*** Engineers *(continued)*
- 087 Computer engineer - hardware
- 088 Computer engineer - software
- 089 Electrical, electronic engineer
- 090 Environmental engineer
- 091 Industrial engineer
- 092 Marine engineer or naval architect engineer
- 093 Materials or metallurgical engineer
- 094 Mechanical engineer
- 095 Mining or geological engineer
- 096 Nuclear engineer
- 097 Petroleum engineer
- 098 Sales engineer
- 099 Other engineers

*** Engineering Technologists and Technicians
- 100 Electrical, electronic, industrial, mechanical
- 101 Drafting occupations, including computer drafting
- 102 Surveying and mapping
- 103 OTHER engineering technologists and technicians

104 Surveyors

110 **Farmers, Foresters & Fishermen**

Health Occupations
111 Diagnosing/Treating Practitioners (e.g., dentists, optometrists, physicians, psychiatrists, podiatrists, surgeons, veterinarians)
112 Registered nurses, pharmacists, dieticians, therapists, physician assistants
236 Psychologists, including clinical
113 Health Technologists & Technicians (e.g., dental hygienists, health record technologists/ technicians, licensed practical nurses, medical or laboratory technicians, radiologic technologists/ technicians)
114 OTHER health occupations

120 **Lawyers, Judges**

130 **Librarians, Archivists, Curators**

Managers, Executives, Administrators
(Also see 151-153)
141 Top and mid-level managers, executives, administrators (people who manage other managers)
*** All other managers, including the self-employed - Select the code that comes closest to the field you manage

JOB CATEGORIES LIST (continued)

Management-Related Occupations
(Also see 141)
151 Accountants, auditors, and other financial specialists
152 Personnel, training, and labor relations specialists
153 OTHER management related occupations

Mathematical Scientists
171 Actuaries
172 Mathematicians
173 Operations research analysts, modeling
174 Statisticians
175 Technologists and technicians in the mathematical sciences
176 OTHER mathematical scientists

Physical Scientists
191 Astronomers
192 Atmospheric and space scientists
193 Chemists, except biochemists
194 Geologists, including earth scientists
195 Oceanographers
196 Physicists
197 Technologists and technicians in the physical sciences
198 OTHER physical scientists

*** **Research Associates/Assistants**
(Select the code that comes closest to your field)

Sales and Marketing
200 Insurance, securities, real estate, and business services
201 Sales Occupations - Commodities Except Retail (e.g., industrial machinery/equipment/supplies, medical and dental equipment/supplies)
202 Sales Occupations - Retail (e.g., furnishings, clothing, motor vehicles, cosmetics)
203 OTHER marketing and sales occupations

Service Occupations, Except Health
(Also see 111-114)
221 Food Preparation and Service (e.g., cooks, waitresses, bartenders)
222 Protective services (e.g., fire fighters, police, guards)
223 OTHER service occupations, except health

Social Scientists
231 Anthropologists
232 Economists
233 Historians, science and technology
234 Historians, except science and technology
235 Political scientists
236 Psychologists, including clinical (Also see 070)
237 Sociologists
238 OTHER social scientists

240 **Social Workers**

Teachers/Professors
251 Pre-Kindergarten and kindergarten
252 Elementary
253 Secondary - computer, math, or sciences
254 Secondary - social sciences
255 Secondary - other subjects
256 Special education - primary and secondary
257 OTHER precollegiate area
*** Postsecondary
271 Agriculture
272 Art, Drama, and Music
273 Biological Sciences
274 Business Commerce and Marketing
275 Chemistry
276 Computer Science
277 Earth, Environmental, and Marine Science
278 Economics
279 Education
280 Engineering
281 English
282 Foreign Language
283 History
284 Home Economics
285 Law
286 Mathematical Sciences
287 Medical Science
288 Physical Education
289 Physics
290 Political Science
291 Psychology
292 Social Work
293 Sociology
294 Theology
295 Trade and Industrial
296 OTHER health specialties
297 OTHER natural sciences
298 OTHER social sciences
299 OTHER Postsecondary

Other Professions
401 Construction trades, miners and well drillers
402 Mechanics and repairers
403 Precision/production occupations (e.g., metal workers, woodworkers, butchers, bakers, printing occupations, tailors, shoemakers, photographic process)
404 Operators and related occupations (e.g., machine set-up, machine operators and tenders, fabricators, assemblers)
405 Transportation/material moving occupations

500 Other Occupations (Not Listed)

D25. Is the name and address information below the best one for us to use in future mailings?

1 ☐ Yes

2 ☐ No → *Please make name and address changes as needed below. Please print clearly.*

Title	First Name	Middle Initial	Last Name

Number and Street/Apt. No.	City/Town	State	ZIP CODE Plus 4
			—

Country (If outside U.S.)

THANK YOU FOR COMPLETING THE QUESTIONNAIRE.

Please return the completed form in the envelope provided. If you lose the envelope and want another, call 1-800-248-8649. Our address is:

National Research Council
TJ 1021
2101 Constitution Avenue, NW
Washington, DC 20418

APPENDIX C

Description of Terms

Field of doctorate was the field of degree as specified by the respondent in the Survey of Earned Doctorates at the time of degree conferral. Fields were aggregated into broad groups for analysis (see Appendix D).

Employment status was derived from several questions on the survey (see Appendix B). Respondents were counted as employed (full-time or part-time) if question A1 was answered "yes." Question A7 was used to determine full-time employed (response "1") versus part-time employed (response "2"). Not employed were those with a response of "no" to question A1. Within the not employed category, seeking employment included those who responded "yes" to question A2 along with those who responded "no" to question A2 but said they were "on layoff from a job" in question A3; retired included those responding "no" to question A2 and said they were "retired" in question A3 (excluding those counted as seeking employment above); not seeking employment included all others with a response of "no" to question A2.

Employment sector was based on responses to questions A13 and A15. The category "educational institution" included preschool, elementary or middle school or system; secondary school or system; 2-year college, junior college, or technical institute; 4-year college or university; medical school; university-affiliated research institute; and "other" educational institutions. The subcategory "4-year college/university" included 4-year college or university, medical school, and "other" educational institutions. "Private for-profit company" included self-employed in incorporated business and private for-profit company, business, or individual. The "self-employed" category included self-employed in not incorporated business. The category "government" included local, state, and U.S. government (both military and civilian).

Occupation data were derived from responses to several questions on the kind of work done by the respondent. The occupation classification of the respondent was based on his or her principal job held during the reference week (question A18). Also used was a respondent-selected job code (question A19). Occupation of second job was based on responses to questions A46 and A47. Occupation codes were aggregated into broad fields for analysis (see Appendix E).

APPENDIX D

Ph.D. Fields in the 1995 Survey of Doctorate Recipients

COMPUTER AND INFORMATION SCIENCES

400 Computer Sciences
410 Information Sci. & Systems

MATHEMATICAL SCIENCES

420 Applied Mathematics
425 Algebra
430 Analysis & Functional Analysis
435 Geometry
440 Logic
445 Number Theory
450 Math Probability & Statistics
455 Topology
460 Computing Theory & Practice
465 Operations Research
498 Mathematics, General
499 Mathematics, Other

CHEMISTRY

520 Analytical
521 Agriculture & Food
522 Inorganic
524 Nuclear
526 Organic
528 Pharmaceutical
530 Physical
532 Polymer
534 Theoretical
538 Chemistry, General
539 Chemistry, Other

PHYSICS AND ASTRONOMY

500 Astronomy
505 Astrophysics
506 Astronomy & Astrophysics
560 Acoustics
561 Atomic & Molecular
562 Electron
563 Electromagnetism
564 Elementary Particle
566 Fluids
567 Mechanics
568 Nuclear
569 Optics
570 Plasma
572 Polymer
573 Thermal
574 Solid State
575 Theoretical
578 Physics, General
579 Physics, Other
585 Hydrology & Water Resources
595 Marine Sciences
599 Physical Sciences, Other

EARTH/ATMOSPHERIC/MARINE SCIENCES

510 Atmospheric Physics & Chem.
512 Atmospheric Dynamics
514 Meteorology
518 Atmos. & Meteor. Sci., Gen.
519 Atmos. & Meteor. Sci., Other
540 Geology
542 Geochemistry
544 Geophysics & Seismology
545 Geophysics (solid earth)
546 Paleontology
547 Fuel Technology & Petroleum Engineering
548 Mineralogy, Petrology
549 Mineralogy, Petrology, & Geochemistry
550 Stratigraphy, Sedimentation
552 Geomorphology & Glacial Geology
554 Applied Geology
555 Applied Geology/Geological Engineering
558 Geological Sciences, General
559 Geological Sciences, Other
590 Oceanography

AGRICULTURAL/ENVIRONMENTAL SCIENCES

005 Animal Breeding & Genetics
007 Animal Husbandry
010 Animal Nutrition
012 Dairy Science
014 Poultry Science
019 Animal Sciences, Other
020 Agronomy
025 Plant Breeding & Genetics
030 Plant Pathology
032 Plant Protect/Pest Management
039 Plant Sciences, Other
040 Food Science
042 Food Distribution
043 Food Engineering
044 Food Sciences, Other
045 Soil Science
046 Soil Chemistry/Microbiology
049 Soil Sciences, Other
050 Horticulture Science
098 Agriculture, General
099 Agricultural Sciences, Other
054 Fish & Wildlife
055 Fisheries Sciences
060 Wildlife
065 Forestry
066 Forest Biology
068 Forest Engineering
070 Forest Management
072 Wood Science
074 Renewable Natural Resources
079 Forestry & Related Sci, Other
080 Wildlife/Range Management
580 Environmental Sciences

BIOLOGICAL SCIENCES

100	Biochemistry
103	Biomedical Science
105	Biophysics
107	Biotechnology Research
110	Bacteriology
115	Plant Genetics
120	Plant Pathology
125	Plant Physiology
129	Botany, Other
130	Anatomy
133	Biometrics & Biostatistics
136	Cell Biology
139	Ecology
140	Hydrobiology
142	Developmental Bio./Embry.
145	Endocrinology
148	Entomology
151	Immunology
154	Molecular Biology
156	Microbiology & Bacteriology
157	Microbiology
160	Neurosciences
163	Nutritional Sciences
166	Parasitology
169	Toxicology
170	Genetics, Human & Animal
171	Genetics
175	Pathology, Human & Animal
180	Pharmacology, Hum. & Anim.
185	Physiology, Human & Animal
186	Physiology, Animal and Plant
189	Zoology, Other
198	Biological Sciences, General
199	Biological Sciences, Other

HEALTH SCIENCES

200	Audiology & Speech Pathology
205	Dentistry
210	Environmental Health
212	Health Systems/Services Administration
215	Public Health
219	Public Health & Epidemiology
220	Epidemiology
222	Exercise Physiology/Sci., Kinesiology
224	Hospital Administration
225	Medicine & Surgery
230	Nursing
235	Optometry & Ophthalmology
240	Pharmacy
245	Rehabilitation/Therapeutic Services
250	Veterinary Medicine
298	Health Sciences, General
299	Health Sciences, Other

SOCIAL SCIENCES

000	Agricultural Economics
650	Anthropology
652	Area Studies
658	Criminology
662	Demography
666	Economics
668	Econometrics
670	Geography
672	Human/Individual & Family Development
674	International Relations
678	Political Science & Government
679	Political Science/Public Administration
682	Public Policy Studies
686	Sociology
690	Statistics
694	Urban Studies
698	Social Sciences, General
699	Social Sciences, Other
710	History of Science
711	Linguistics
773	Archeology

PSYCHOLOGY

600	Clinical
603	Cognitive
606	Comparative
609	Counseling
612	Developmental
615	Experimental
616	Experimental, Comparative & Physiological
618	Educational
619	Human Engineering
620	Family & Marriage Counseling
621	Industrial & Organizational
624	Personality
627	Physiological
630	Psychometrics
633	Quantitative
636	School
639	Social
648	Psychology, General
649	Psychology, Other

ENGINEERING

300 Aerospace, Aeronautical & Astronautical
303 Agricultural
306 Bioengineering & Biomedical
309 Ceramic
312 Chemical
315 Civil
318 Communications
321 Computer
322 Electrical
323 Electronics
324 Electrical, Electronics
327 Engineering Mechanics
330 Engineering Physics
333 Engineering Science
336 Environmental Health Engin.
339 Industrial
342 Materials Science
345 Mechanical
348 Metallurgical
351 Mining & Mineral
354 Naval Architecture & Marine Engineering
357 Nuclear
360 Ocean
363 Operations Research
366 Petroleum
369 Polymer
372 Systems
375 Textile
398 Engineering, General
399 Engineering, Other

APPENDIX E

Occupation Codes

SCIENTISTS

Computer Scientists
052 Computer system analysts
053 Computer scientists, except system analysts
054 Information systems scientists or analysts
055 OTHER computer, information science occupations
088 Computer engineer - software

Mathematical Scientists
172 Mathematicians
173 Operations research analysts, modeling
174 Statisticians
176 OTHER mathematical scientists

Chemists
193 Chemists, except biochemists

Physicists
191 Astronomers
196 Physicists

Earth/Atmospheric/Marine Scientists
192 Atmospheric and space scientists
194 Geologists, including earth scientists
195 Oceanographers
198 OTHER physical scientists

Agricultural/Environmental Scientists
021 Agricultural and food scientists
024 Forestry, conservation scientists

Biological Scientists
022 Biochemists and biophysicists
023 Biological scientists (e.g., botanists, ecologists, zoologists)
025 Medical scientists (excluding practitioners)
027 OTHER biological/life scientists

Health Scientists
111 Diagnosing/Treating Practitioners (e.g., dentists, optometrists, physicians, psychiatrists, podiatrists, surgeons, veterinarians)
112 Registered nurses, pharmacists, dieticians, therapists, physician assistants
114 OTHER health occupations

Social Scientists
231 Anthropologists
232 Economists
233 Historians, science and technology
235 Political scientists
237 Sociologists
238 OTHER social scientists

Psychologists
236 Psychologists, including clinical

ENGINEERS

082 Aeronautical, aerospace, astronautical
083 Agricultural
084 Bioengineering and biomedical
085 Chemical
086 Civil, including architectural and sanitary
087 Computer engineer - hardware
089 Electrical, electronic
090 Environmental
091 Industrial
092 Marine engineer or naval architect
093 Materials or metallurgical
094 Mechanical
095 Mining or geological
096 Nuclear
097 Petroleum
098 Sales
099 Other engineers

POSTSECONDARY TEACHERS OF SCIENCE

271 Agriculture
273 Biological Sciences
275 Chemistry
276 Computer Science
277 Earth, Environmental, and Marine Science
278 Economics
286 Mathematical Sciences
287 Medical Science
289 Physics
290 Political Science
291 Psychology
293 Sociology
296 OTHER health specialties
297 OTHER natural sciences
298 OTHER social sciences

POSTSECONDARY TEACHERS OF ENGINEERING

280 Engineering

OTHER TEACHERS/PROFESSORS

251 Pre-Kindergarten and kindergarten
252 Elementary
253 Secondary - computer, math, or sciences
254 Secondary - social sciences
255 Secondary - other subjects
256 Special education - primary and secondary
257 OTHER precollegiate area
272 Postsecondary, Art, Drama, and Music
274 Postsecondary, Business Commerce and Marketing
279 Postsecondary, Education
281 Postsecondary, English
282 Postsecondary, Foreign Language
283 Postsecondary, History
284 Postsecondary, Home Economics
285 Postsecondary, Law

288 Postsecondary, Physical Education
292 Postsecondary, Social Work
294 Postsecondary, Theology
295 Postsecondary, Trade and Industrial
299 OTHER Postsecondary

TOP/MID-LEVEL MANAGERS

141 Top and mid-level managers, executives, administrators (people who manage other managers)

MANAGEMENT-RELATED OCCUPATIONS

151 Accountants, auditors, and other financial specialists
152 Personnel, training, and labor relations specialists
153 OTHER management related occupations

TECHNOLOGISTS

026 Technologists and technicians in the biological/life sciences
051 Computer programmers (business, scientific, process control)
081 Architects
100 Electrical, electronic, industrial, mechanical
101 Drafting occupations, including computer drafting
102 Surveying and mapping
103 OTHER engineering technologists and technicians
104 Surveyors
113 Health Technologists & Technicians (e.g., dental hygienists, health record technologist/technicians, licensed practical nurses, medical or laboratory technicians, radiologic technologists/technicians)
175 Technologists and technicians in the mathematical sciences
197 Technologists and technicians in the physical sciences

OTHER OCCUPATIONS

010 Artists, Broadcasters, Editors, Entertainers, Public Relations Specialists, Writers
031 Accounting clerks, bookkeepers
032 Secretaries, receptionists, typists
033 OTHER administrative (e.g., record clerks, telephone operators)
040 Clergy and Other Religious Workers
070 Counselors, Educational and Vocational
110 Farmers, Foresters & Fishermen
120 Lawyers, Judges
130 Librarians, Archivists, Curators
171 Actuaries
200 Insurance, securities, real estate, and business services
201 Sales Occupations - Commodities Except Retail (e.g., industrial machinery/equipment/supplies, medical and dental equipment/supplies)
202 Sales Occupations - Retail (e.g., furnishings, clothing, motor vehicles, cosmetics)
203 OTHER marketing and sales occupations
221 Food Preparation and Service (e.g., cooks, waitresses, bartenders)
222 Protective services (e.g., fire fighters, police, guards)
223 OTHER service occupations, except health
234 Historians, except science and technology
240 Social Workers
401 Construction trades, miners and well drillers
402 Mechanics and repairers
403 Precision/production occupations (e.g., metal workers, woodworkers, butchers, bakers, printing occupations, tailors, shoemakers, photographic process)
404 Operators and related occupations (e.g., machine set-up, machine operators and tenders, fabricators, assemblers)
405 Transportation/material moving occupations
500 Other Occupations

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