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ABSTRACT

Findings are presented from the National Center for Education Statistics' 1978 Recent College Graduates Survey, which estimates the number of recent graduates and the February 1978 employment and salary status of individuals who received bachelor's degrees from July 1, 1976, to June 30, 1977. A nationally representative sample of 297 institutions was selected, and 11,729 graduates were sampled. Data are presented by major field on the percent of graduates employed full-time, their unemployment rate, the percent underemployed, and their average annual salaries. The statistics are presented separately for men and women graduates and for those who are enrolled for an advanced degree. Twenty-eight relatively specific major fields and 11 more general major fields are covered, along with majors in professional fields, arts and sciences, and other fields. Of the approximately 930,000 persons who received bachelor's degrees in the 1976-1977 academic year, an estimated 68 percent were employed full-time; but the unemployment rate was 5.8 percent, and 24 percent of those employed full-time were underemployed. The average annual salary for those employed full-time was about \$11,500. Bachelor's recipients who majored in professional fields fared better than bachelor's recipients who majored in the arts and sciences. However, arts and sciences graduates were much more likely than graduates in professional fields to be enrolled for an advanced degree, which discourages working full-time. Graduates in business and management had the highest percentage of full-time employment (83 percent) and graduates in public affairs and social services had the lowest percentage (68 percent). (SW)

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Labor Force Status of Recent College Graduates

by

A. Stafford Metz

Charles H. Hammer

National Center for Education Statistics

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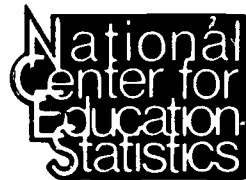
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"The purpose of the Center shall be to collect and disseminate statistics and other data related to education in the United States and in other nations. The Center shall . . . collect, collate, and, from time to time, report full and complete statistics on the conditions of education in the United States; conduct and publish reports on specialized analyses of the meaning and significance of such statistics; . . . and review and report on education activities in foreign countries."--Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e-1).

Foreword

This report is based on data from NCES's 1978 Recent College Graduates Survey. The purpose of the survey was to estimate the number of recent graduates who were qualified to teach and determine their status in the labor force. Data included in this report, however, cover graduates in all major fields.

The survey covered individuals who received bachelor's degrees from July 1, 1976, to June 30, 1977. This was a two-stage sample survey. A nationally representative sample of 297 institutions was selected, and from these 11,729 graduates were sampled.

Data included here are presented by major field on the percent of graduates employed full-time, their unemployment rate, the percent underemployed and their average annual salaries. Some of the statistics may be distributed differently for males and females and for those who do and do not go on for an advanced degree. Therefore, the data are also presented separately for men and women graduates and for those who are enrolled and not enrolled for an advanced degree.

Norman Beller
Assistant Administrator
Division of Elementary and
Secondary Education Statistics
December 1981

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For More Information

This is one of several reports based on the 1978 Recent College Graduates Survey. The others are:

New Teachers in the Job Market, copies of which are available from the Education Resources Information Center (ERIC). The cost is \$3.95 per paper copy and \$0.91 for microfiche. When ordering, use number ED 206572 and make check payable to EDRS. Send order to Document Reproduction Service, P.O. Box 190, Arlington, Virginia 22210.

Occupations of Recent College Graduates, copies of which are available from the National Technical Information Service (NTIS). The cost is \$8.00 per paper copy and \$3.50 for microfiche. When ordering, use accession number PB82 120890 and make check payable to the National Technical Information Service. Send order to the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Rd., Springfield, Virginia 22161.

The computer tape containing all survey information is available from the Statistical Information Office, National Center for Education Statistics, (1001 Presidential Bldg.), 400 Maryland Ave. S.W., Washington, D.C. 20202, telephone (301)436-7900. Information about the Center's statistical program and a catalog of NCES publications may also be obtained from the Statistical Information Office.

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Introduction

For many students deliberating the choice of an academic major in college, questions about employment and earning potential following graduation are of major importance. One who wishes to be employed full-time or to use his or her college education in a job after graduation will want to know which major fields are more likely to lead to these objectives. One who gives primary importance to a well-paying job after graduation will want to know which major fields are more likely to lead to initially high-salaried jobs. This report provides information for students and others concerning the employment status, by major field, of college graduates shortly after receiving their bachelor's degrees.

The data for this report come from the 1978 Recent College Graduates Survey. This survey obtained information on the February 1978 employment and salary status of a nationally representative sample of bachelor's degree recipients who received their degrees during the period July 1, 1976, through June 30, 1977.¹ Data are presented for 28 relatively specific major fields, for 11 more general major field groups, and for bachelor's recipients with majors in professional fields, arts and sciences, and other

¹See appendix 1 for a description of the Recent College Graduate Survey.

fields.² For bachelor's recipients in each major field, major field group, and for majors in professional fields, arts and sciences, and other fields, statistics are presented on the following four employment/salary status indicators:

- percent of bachelor's degree recipients employed full-time;
- unemployment rate³;

²See appendix 2 for the HEGIS classification of major fields used for coding purposes and appendix 3 for the major field code groupings which comprise the major field groups in the tables.

³Unemployed graduates are those who, during the survey week, had no employment and engaged in job-seeking activities within the preceding 4 weeks.

- percent of bachelor's recipients employed who are underemployed⁴;
- average annual salary for the principal job held by bachelor's degree recipients employed full-time.

Since the employment experiences of graduates enrolled for an advanced degree may be different from those not enrolled, statistics are presented separately for those two groups of graduates. The same applies to men and women graduates.

⁴Underemployed graduates are those not working in professional, managerial or technical types of jobs and who reported that, in their opinion, a college degree was not required to get their job.

Findings

All Bachelor's Recipients

Approximately 930,000 persons received bachelor's degrees in the 1976-77 school year. Of this total, an estimated 68 percent were employed full-time and the unemployment rate was 5.8 percent. A substantial proportion (24 percent) of those employed full-time were underemployed. Finally, the average annual salary for those employed full-time was about \$11,500.

Professional Fields Compared with Arts and Sciences

On all four employment/salary status indicators, bachelor's recipients who majored in professional fields fared better than bachelor's recipients who majored in the arts and sciences. The employment/salary status for the two groups and for all bachelor's recipients is shown below.⁵

Major Field Groups

Within the professional fields and arts and sciences, 11 major field groups were established. Relatively small differences in percent employed full-time were found among the five major field groups within the professional fields (table 1). Graduates in business and management had the

Employment/salary status indicator

	Percent of bachelor's recipients employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are underemployed	Average salary for principal job held by bachelor's recipients employed full-time
All bachelor's recipients	68	5.8	24	\$11,500
Professional fields	79	3.9	15	12,300
Arts and sciences	54	8.4	34	10,300

⁵The professional fields category consists of those major fields for which there are, generally, separate schools within colleges and universities, such as schools of business administration, education, nursing, social work, and engineering. Professional fields categories used in this report are business and management, education, engineering,

health professions, and public affairs and social services. Major fields classified under arts and sciences fall primarily under the general umbrella of arts and science programs. The arts and science categories used in this report are biological sciences, mathematics, physical sciences, social sciences, humanities, and psychology.

highest percentage of full-time employment (83 percent), and graduates in public affairs and social services had the lowest percentage (68 percent). The unemployment rate varied little from a low of 3.2 percent for graduates in business and management to a high of 5.4 percent for graduates in public affairs and social services. With the exception of public affairs and social services, the percentage of graduates employed full-time who were underemployed ranged from 2 percent for majors in the health professions to 19 percent for majors in business and management. Underemployment for public affairs and social services graduates was 39 percent.⁶ Engineering graduates had the highest average salary (\$15,500) and education majors the lowest (\$9,500).⁷

Data for arts and science graduates for the individual major fields in terms of percent employed full-time are misleading because of the impact of enrollment for an advanced degree, as discussed previously. The reader is, therefore, referred to the following section where the labor force outcome of graduates not enrolled and enrolled for an advanced degree is looked at separately.

In examining unemployment for arts and sciences graduates, considerable variation was found (table 1). No mathematics graduates in the survey sample experienced unemployment. At the other extreme, the unemployment rates for humanities and biological sciences graduates were high (10.7 and 10.5 respectively). In the case of underemployment, graduates in the physical sciences had the lowest percentage of underemployment (18 percent) and those in the humanities had the highest (43 percent). Physical sciences graduates had the highest average annual salary, \$11,500, and graduates in the humanities the lowest, \$9,000.⁸

⁶The fields within this field group are heterogeneous and some may have a percentage underemployed which is significantly lower or higher than the percentage reported for the field group.

⁷One factor contributing to the low salaries for education majors is the fact that most education majors have teaching as their principal job and teachers generally work on 9- or 10-month rather than 12-month contracts.

⁸For the occupations held by graduates who majored in biological sciences, and by graduates who majored in other fields, see *Occupations of Recent College Graduates*. National Center for Education Statistics, 1981.

Examination of the major field groups for all four indicators collectively showed that graduates in engineering fared particularly well. This group was high on full-time employment (81 percent) and salary (\$15,500) and low on both unemployment (5.0) and underemployment (6 percent). Graduates in the health professions and in business and management also fared well, though not quite as well as engineering graduates. The average annual income for health professions graduates was not as high as for engineering graduates, and business and management graduates' underemployment percent was considerably higher than that for engineering graduates. At the other extreme, graduates in the humanities did not fare well. They had the highest rate of unemployment (10.7), the highest percentage of underemployment (43 percent), and the lowest average annual salary (\$9,000).

Labor Force Status of Bachelor's Recipients Enrolled and Not Enrolled for an Advanced Degree

It was indicated in the previous section that graduates who majored in the arts and sciences were much more likely to be enrolled for an advanced degree than were majors in the professional fields. Being enrolled and not enrolled for a degree impacts, in turn, on labor market outcome, particularly in terms of the extent of full-time employment. For this reason, the labor market outcome for those graduates in the different major fields who were not enrolled for an advanced degree is looked at separately in this section and is then contrasted with those who were enrolled for an advanced degree.

When only those not enrolled for an advanced degree are examined, the difference between graduates in the professional fields and arts and sciences, for those employed full-time (85 and 73 percent respectively) was considerably smaller than the difference indicated earlier for all graduates (79 compared to 54 percent). For those not enrolled for an advanced degree, therefore, arts and

science majors did not fare nearly as badly in terms of full-time employment as they did in the case of all graduates. For those not enrolled for an advanced degree, engineering, health professions and business and management had the highest proportion employed full-time (ranging from 93 to 89 percent) and psychology and humanities were lowest (69 and 68 percent respectively) (table 2).

When examined separately, the unemployment rate for graduates not enrolled for an advanced degree was not materially different from that for all graduates (5.3 percent and 5.8 percent respectively). This also applies to the percent underemployed and average salaries, which is to be expected, since these are based only on graduates employed full-time. The bulk of these graduates were not enrolled for an advanced degree.

As was anticipated, the percent of graduates working full-time who were enrolled for an advanced degree was quite different from the percent not enrolled—32 and 80 percent respectively (tables 2 and 3). These differences held up across all major field groups. Differences between graduates enrolled and not enrolled for an advanced degree were generally negligible for each of the other three employment/salary indicators, except in certain cases where the unemployment rate was higher for those enrolled for an advanced degree.

Labor Force Status of Men and Women Bachelor's Recipients

With one exception⁹, the only striking differences between men and women on the four labor force status indicators was that men's average annual salaries were

⁹Considerable differences existed in the percentages between men and women graduates in public affairs and social services who were employed full-time and underemployed. These differences, however, are not of major importance because of the heterogeneity of the fields within this field group and the likelihood that the pattern of distribution of men across their fields is likely to be different from that of women.

higher than women's (tables 2 and 3). Only in the case of biological sciences did women have a higher average annual salary than men. This indicates that in some respects, women have achieved a measure of equalization in their labor force status relative to men but are still lagging with respect to income.

Labor Force Status of Bachelor's Recipients in Individual Major Fields

Data on the four labor force status indicators for 28 major fields are presented in table 6. This table can serve as a reference source for persons interested in more specific fields.¹⁰ It can be seen, for example, that for bachelor's recipients majoring in business, management and administration, 81 percent were employed full-time and they had an unemployment rate of 3.5. Of those employed full-time, 28 percent were underemployed and the average annual salary was \$13,000. For graduates in letters, on the other hand, 54 percent were employed full-time, their unemployment rate was 11.8, 42 percent were underemployed and they had an average annual salary of \$9,000. The sample size was not large enough to reliably separate the more detailed major fields into those not enrolled and enrolled for an advanced degree. However, it must be remembered that, for the arts and science fields, the proportion not enrolled for an advanced degree who are employed full-time would be considerably larger.

¹⁰Data are provided for major fields which numbered 8,200 or more bachelor's recipients.

Tables

Table 1.—Employment/salary status in February 1978 of 1976-77 bachelor's degree recipients, by major field groups

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	929,800	68	5.8	24	\$ 11,500
Professional fields	437,100	79	3.9	15	12,300
Business and management	162,200	83	3.2	19	13,300
Education	138,200	74	4.1	15	9,500
Engineering	54,400	81	5.0	6	15,500
Health professions	61,300	79	3.9	2	12,500
Public affairs and social services	21,100	68	5.4	39	11,500
Arts and sciences	369,400	54	8.4	34	10,300
Biological sciences	69,000	46	10.5	27	9,800
Mathematics	13,100	70	0.0	21	11,400
Physical sciences	23,200	52	2.7	18	11,500
Psychology	57,800	54	5.4	36	10,400
Social sciences	118,100	55	9.4	35	11,200
Humanities	88,100	57	10.7	43	9,000

Note: Included in the total are graduates in fields classified as other than professional fields or arts and sciences. These other fields are shown in table 6.

Table 2.—Employment/salary status in February 1978 of '1976-77 bachelor's degree recipients, by major field groups, not enrolled for an advanced degree

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	694,400	80	5.3	23	11,500
Professional fields	361,200	85	3.6	14	12,300
Business and management	137,600	89	2.9	19	13,400
Education	113,500	78	4.2	15	9,500
Engineering	43,800	93	4.5	6	15,500
Health professions	50,600	90	1.9	2	12,500
Public affairs and social services	15,700	75	7.2	40	11,500
Arts and sciences	235,300	73	7.9	34	10,300
Biological sciences	34,800	77	9.4	25	9,700
Mathematics	9,100	84	0.0	24	11,000
Physical sciences	12,500	81	2.5	18	11,700
Psychology	38,000	69	6.0	35	10,400
Social sciences	75,500	74	7.2	35	11,000
Humanities	65,400	68	11.2	43	9,100

Note: Included in the total are graduates in fields classified as other than professional fields or arts and sciences. These other fields are shown in table 6, but not by enrollment status.

Table 3.—Employment/salary status in February 1978 of 1976-77 bachelor's degree recipients, by major field groups, enrolled for an advanced degree

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	235,300	32	8.0	26	11,500
Professional fields	75,900	48	6.1	16	11,900
Business and management	24,600	50	5.2	17	13,100
Education	24,600	59	3.6	16	9,700
Engineering	10,600	35	8.2	5	15,200
Health professions	10,700	29	17.5	5	12,700
Public affairs and social services	5,400	47	0.0	36	11,400
Arts and sciences	134,200	22	9.9	37	10,800
Biological sciences	34,200	14	13.3	25	10,500
Mathematics	4,000	38	0.0	5	14,600
Physical sciences	10,800	18	3.0	20	9,900
Psychology	19,900	27	3.4	44	9,800
Social sciences	42,600	23	14.7	38	13,000
Humanities	22,700	27	8.9	43	7,700

Note: Included in the total are graduates in fields classified as other than professional fields or arts and sciences. These other fields are shown in table 6, but not by enrollment status.

Table 4.—Employment/salary status in February 1978 of 1976-77 bachelor's degree recipients, by major field groups, male

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	512,000	70	5.2	25	12,800
Professional fields	236,500	83	3.2	17	13,800
Business and management	124,000	85	2.1	20	14,000
Education	34,500	83	4.2	18	10,500
Engineering	51,900	82	4.8	7	15,500
Health professions	15,500	74	5.6	2	13,900
Public affairs and social services	10,500	82	2.6	49	13,900
Arts and sciences	204,500	54	8.1	32	11,300
Biological sciences	47,200	42	10.8	32	9,700
Mathematics	27,500	68	0.0	17	12,200
Physical sciences	71,500	52	2.0	20	12,000
Psychology	33,600	62	6.1	28	11,300
Social sciences	24,600	55	8.2	31	12,500
Humanities	70,200	61	11.7	46	9,700

Note: Included in the total are graduates in fields classified as other than professional fields or arts and sciences. These other fields are shown in table 6, but not separately by sex.

Table 5.—Employment/salary status in February 1978 of 1976-77 bachelor's degree recipients, by major field groups, female

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	416,500	66	6.6	22	\$ 9,700
Professional fields	200,100	74	4.8	11	10,300
Business and management	38,000	77	7.1	15	11,100
Education	103,200	72	4.1	13	9,100
Engineering	2,500	—	—	—	—
Health professions	45,700	81	3.4	2	12,100
Public affairs and social services	10,600	53	8.6	23	8,300
Arts and sciences	164,300	54	8.6	37	9,200
Biological sciences	21,600	53	10.1	16	10,100
Mathematics	4,800	—	—	—	—
Physical sciences	3,800	—	—	—	—
Psychology	33,200	49	4.7	44	9,500
Social sciences	46,300	56	10.0	41	9,400
Humanities	54,500	55	10.1	41	8,500

—Number of graduates in sample too small to make reliable estimates.

Note: Included in the total are graduates in fields classified as other than professional fields or arts and sciences. These other fields are shown in table 6, but not separately by sex.

Table 6.—Employment/salary status in February 1978 of 1976-77 bachelor's recipients by specific major fields.

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate ¹	Percent of bachelor's recipients employed full-time who are under-employed ²	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	929,800	68	5.8	24	11,500
Professional fields	437,100	79	3.9	15	12,300
Business and management	162,200	83	3.2	19	13,300
Business and commerce, general	12,000	78	1.8	27	12,600
Accounting	44,100	89	2.5	4	13,700
Business, management, and administration	70,000	81	3.5	28	13,000
Marketing and purchasing	17,600	82	4.7	22	14,700
Other business and management	18,600	86	3.3	18	12,700
Education	138,200	74	4.1	15	9,500
Elementary education, general	49,600	74	4.9	12	9,200
Special education	18,800	81	3.4	8	9,200
Physical education	17,400	73	6.1	20	10,500
Other education	52,300	73	3.0	19	9,600
Engineering	54,400	81	5.0	6	15,500
Civil, construction, and transportation engineering	12,900	90	3.0	5	15,300
Electrical, electronics and communications engineering	13,300	77	7.5	0	15,300
Other	28,200	79	4.7	10	15,600
Health professions	61,300	79	3.9	2	12,500
Nursing	31,200	84	2.6	0	12,600
Pharmacy	9,200	73	9.9	0	12,500
Other	20,900	75	3.4	7	12,300
Public affairs and social services	21,100	68	5.4	39	11,500
Social work and helping services	9,400	70	6.0	36	10,000
Other	11,700	66	5.0	42	12,800
Arts and sciences	369,400	54	8.4	34	10,300
Biological sciences	69,000	46	10.5	27	9,800
Biology, general	40,600	49	7.7	23	9,800
Other	28,500	41	14.8	33	9,800
Mathematics	13,100	70	0.0	21	11,400
Physical sciences	23,200	52	2.7	18	11,500
Chemistry, general	12,100	53	3.0	13	10,800
Other	11,200	50	2.3	24	12,300
Psychology	57,800	54	5.4	36	10,400
Social sciences	118,100	55	9.4	35	11,200
Economics	16,800	59	8.8	15	13,200
History	30,300	55	5.1	52	10,900
Political science and government	27,600	46	12.0	34	10,800
Sociology	23,800	60	13.9	30	9,700
Other	19,500	60	6.0	34	12,100

Table 6.—Employment/salary status in February 1978 of 1976-77 bachelor's recipients by specific major fields—
Continued.

Major field group	Total bachelor's recipients	Employment/salary indicator			
		Percent of total bachelor's recipients who are employed full-time	Unemployment rate ¹	Percent of bachelor's recipients employed full-time who are underemployed ²	Average annual salary for principal job held by bachelor's recipients employed full-time
Humanities	88,100	57	10.7	43	9,000
Fine and applied arts	38,700	61	10.8	44	9,000
Foreign languages	10,800	56	7.0	41	9,200
Letters	38,600	54	11.8	42	9,000
Other	120,600	68	6.8	29	11,200
Agriculture and natural resources	17,000	72	6.0	32	11,000
Journalism	9,100	83	3.2	26	9,900
Architecture	8,200	65	9.9	16	11,900
Home economics	17,400	64	5.1	39	8,700
Law enforcement and corrections	18,100	86	3.7	69	13,600
Other	50,800	66	8.1	50	12,100

¹ Unemployed graduates are those who, during the survey week, had no employment and engaged in job-seeking activities within the past four weeks.

² Underemployed graduates are those not working in professional, managerial, or technical types of jobs and who reported that, in their opinion, a college degree was not required to get their job.

Appendixes

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Appendix 1

Proportions of Graduates in the Major Field Groups, By Sex and by Enrollment Status

The following table shows the proportions of graduates in the major field groups broken down by sex and by whether or not they are enrolled for an advanced degree.

Major field	Total	Enrolled for an advanced degree	Not enrolled for an advanced degree	Male	Female
(percent)					
Total bachelor's recipients	100	25	75	55	45
Total professions	100	17	83	54	46
Business and management	100	15	85	76	24
Education	100	18	82	25	75
Engineering	100	11	81	95	5
Health professions	100	17	83	25	75
Public affairs and social services	100	26	74	50	50
Total arts and sciences	100	36	64	55	45
Biological sciences	100	50	50	69	31
Mathematics and physical sciences	100	41	59	76	24
Social sciences	100	36	64	61	39
Humanities	100	26	74	38	62
Psychology	100	34	66	43	57

Appendix 2

Survey Methodology

The 1978 Recent College Graduates Survey (RCGS) is the source of the estimates which appear in this report. The National Center for Education Statistics contracted with the National Opinion Research Center to collect these data. The major purposes for the survey were to estimate the number of recent college graduates who were qualified to teach and to describe their performance in the labor force.

Sample Design

The 1978 RCGS was a mail sample survey of persons who received a bachelor's or master's degree in school year 1976-1977. The survey was conducted in the spring of 1978.

The RCGS was a two-stage stratified, cluster sample. The first stage was a sample of institutions which awarded bachelor's or master's degrees in 1976-77, according to that year's Higher Education General Information Survey (HEGIS). The institutions were stratified by percent of education graduates, control (private/public), degree of emphasis on special education, and geographic region. Those institutions defined to be predominately black were placed in a separate stratum. A sample of 297 institutions was selected with probability proportional to the institution's measure of size. The measure of size was a function of the number of graduates and the percentage of education graduates in the institution.

The second stage was the selection of graduates from the sample institutions. The graduates were first stratified by major field (special education/other education/other major field). The sampling rate used to select graduates varies by strata; however, all graduates within a stratum were sampled at a fixed rate. Thus, all "special education" graduates had the same overall probability of selection which differed from probability used for "other education" graduates. In all 11,729 graduates were selected.

After the planned survey was completed, the response rate was examined and deemed to be too low (see Reliability section). A follow-up sample was conducted to reduce the potential bias due to non-response. One-fourth of the non-responding graduates were sampled for intensive

follow-up. Graduates from predominately black institutions were followed-up at twice that rate because they had a considerably lower response rate.

A ratio estimate was used to inflate the data to national figures. The 1976-77 HEGIS counts of graduates by stratum were the basis for the ratios. A special weighting for the graduates in the follow-up was done to adjust for the sub-sampling.

Reliability

The statistics that appear in this report are based on a sample. In a sample, two types of errors can occur: 1) Sampling errors which arise because only a portion of the universe is surveyed; and 2) nonsampling errors which are intrinsic to the survey. Nonsampling errors can come from coding mistakes, faulty questionnaire design, incomplete responses and a variety of other sources.

The realized 1978 RCGS is just one of many samples of the same size that could have been selected using the same design. The estimates derived from different sam-

ples would not be identical. The standard error of the estimate is a measure of the difference between the sample estimates and their average value in all possible samples. The coefficient of variation is defined as the standard error of the estimate divided by the estimate. It is a measure of relative precision.

Estimating the standard errors of estimate permit us to construct confidence intervals that have prescribed probabilities of covering the average of all possible samples. For example, an interval from one standard error below the estimate of the average value to one standard error above the estimate would include the average from all possible samples 67 percent of the time. An interval from two standard errors below the estimate to two standard errors above the estimate would include the average of all possible samples 95 percent of the time. The average of all possible samples may or may not be contained in a constructed interval.

Table A contains estimates of the coefficients of variation for the population estimates shown in table 1. The

Table A.—Approximate coefficients of variation for selected estimates

Major field group	Total bachelor's recipients	Percent of total bachelor's recipients who are employed full-time	Unemployment rate	Percent of bachelor's recipients employed full-time who are under-employed	Average annual salary for principal job held by bachelor's recipients employed full-time
Total	.01	.02	.03	.02	.01
Professional fields	.02	.03	.06	.05	.01
Business & management	.03	.06	.13	.07	.02
Education	.02	.03	.12	.07	.01
Engineering	.06	.14	.20	.24	.02
Health professions	.05	.13	.18	.20	.02
Public affairs and social services	.12	.22	.23	.24	.05
Arts & sciences	.02	.04	.05	.06	.02
Biological sciences	.05	.10	.10	.13	.03
Mathematics	.17	.22	.47	.29	.07
Physical sciences	.12	.23	.26	.30	.04
Psychology	.06	.13	.14	.17	.04
Social Sciences	.04	.07	.12	.10	.03
Humanities	.05	.13	.11	.16	.03

coefficients of variation can be used in constructing confidence intervals around the population estimates. For example, table 1 shows that an estimated 83 percent of bachelor's recipients in business and management are employed full-time. The estimated coefficient of variation for this estimate is shown in table A to be 0.06. The standard error of the estimate of 83 percent is roughly 5 percent (83 percent x 0.06), and two standard errors is roughly 10 percent. Two standard errors above and below the estimate of 83 percent includes the average from all possible samples 95 percent of the time. Therefore, a 95 percent confidence interval is 83 percent \pm 10 percent (73 percent to 93 percent).

The sample for this survey was not designed to make

comparisons among the major field groups at specific precision levels. Consequently, the sampling errors for the major field groups vary considerably and differences between fields that have relatively small representations in the population of bachelor's recipients should be interpreted with caution.

One of the most obvious and important sources of non-sampling error is the failure to obtain complete responses from each sample unit. As noted earlier, the response rate for RCGS was not acceptable after the initial effort and a follow-up was conducted. The response rate for the overall sample as well as that for the individual phases is given in table B. Table C shows the sample size overall response rate for various strata.

Table B—Sample size and response rates by phase

	Overall phases	Follow-up sample	
		Graduates from predominately black institutions	Graduates from other institutions
Sampled institutions	297		
Responding institutions	283 (95.3%)		
Total sampled graduates	11,729		
Net sampled graduates ¹	10,949		
Completed cases ²	7,867 (71.9%)		
Adjusted completed cases ³	9,592 (87.6%)		
	Initial sample		
Total sampled graduates	11,729		
Net sampled graduates ¹	11,025		
Completed cases ²	7,399		
Adjusted completed cases ³	7,922		
Total subsampled graduates		190	572
Net subsampled graduates ¹		182	557
Completed cases ²		101	367

Notes: Excludes graduates who were out-of-scope, e.g. received their degree in a different year.

¹Graduates from whom responses were obtained, even if every item on the form was not completed.

²Estimated completion rate when factors for subsampling at different stages are taken into account.

Table C.—Sample size and response rates by stratum

	Graduates			
	Sample size	Out-of-scope	Adjusted completed ¹	Response rate (percent) ²
Type of institution				
Total	11,729	780	9,592	87.6
Predominately black	913	56	688	77.9
Low percent education majors	8,599	628	6,984	87.6
Medium percent education majors	1,215	61	1,053	91.2
High percent education majors	1,002	35	887	91.7
Major field of study				
Total	11,729	780	9,592	87.6
Bachelor's recipients				
Special or vocational education	874	33	793	94.3
Other education	1,549	57	1,340	89.8
Not education	5,913	368	4,837	87.2
Master's recipients				
	3,393	322	2,622	85.4

¹Includes weighting of respondents by factors of 2 or 4 if subsampled.

²Adjusted response rate divided by (sample size - out-of-scopes).

A ratio estimate was used to inflate the data from the respondents. This acts as a partial adjustment for nonresponse by increasing the inflation factors for the respondents. The assumption underlying this adjustment is that the nonrespondents in the stratum are "similar" to the respondents.

No adjustment was made for item nonresponse (item nonresponse is defined as a responding unit not providing

an answer for at least one particular question). The item nonresponse was placed in the "other" category, or if no "other" category was used, it was deleted from the tables. In many instances the item nonresponse was relatively small. Major field of study had an item nonresponse rate of about 0.3 percent. This will cause a slight underestimate of the number of graduates by major field of study.

Appendix 3

HEGIS classification of major fields

0100 AGRICULTURE AND NATURAL RESOURCES		0500 BUSINESS AND MANAGEMENT	
0101	AGRICULTURE, GENERAL	0511	REAL ESTATE
0102	AGRONOMY	0512	INSURANCE
0103	SOILS SCIENCE	0513	INTERNATIONAL BUSINESS
0104	ANIMAL SCIENCE	0514	SECRETARIAL STUDIES
0105	DAIRY SCIENCE		
		0515	PERSONNEL MANAGEMENT
0106	POULTRY SCIENCE	0516	LABOR AND INDUSTRIAL RELATIONS
0107	FISH, GAME, AND WILDLIFE MANAGEMENT	0517	BUSINESS ECONOMICS
0108	HORTICULTURE	0599	OTHER
0109	ORNAMENTAL HORTICULTURE		
0110	AGRICULTURAL AND FARM MANAGEMENT	0600 COMMUNICATIONS	
		0601	COMMUNICATIONS, GENERAL
0111	AGRICULTURAL ECONOMICS	0602	JOURNALISM
0112	AGRICULTURAL BUSINESS	0603	RADIO - TELEVISION
0113	FOOD SCIENCE AND TECHNOLOGY	0604	ADVERTISING
0114	FORESTRY	0605	COMMUNICATION MEDIA
0115	NATURAL RESOURCES MANAGEMENT	0699	OTHER
0116	AGRICULTURE AND FORESTRY TECHNOLOGIES	0700 COMPUTER AND INFORMATION SCIENCES	
0117	RANGE MANAGEMENT	0701	COMPUTER AND INFORMATION SCIENCES, GENERAL
0199	OTHER	0702	INFORMATION SCIENCES AND SYSTEMS
		0703	DATA PROCESSING
0200 ARCHITECTURE AND ENVIRONMENTAL DESIGN		0704	COMPUTER PROGRAMMING
0201	ENVIRONMENTAL DESIGN, GENERAL	0705	SYSTEMS ANALYSIS
0202	ARCHITECTURE	0799	OTHER
0203	INTERIOR DESIGN		
0204	LANDSCAPE ARCHITECTURE	0800 EDUCATION	
0205	URBAN ARCHITECTURE	0801	EDUCATION, GENERAL
0206	CITY, COMMUNITY, AND REGIONAL PLANNING	0802	ELEMENTARY EDUCATION, GENERAL
0299	OTHER	0803	SECONDARY EDUCATION, GENERAL
		0804	JUNIOR HIGH SCHOOL EDUCATION
0300 AREA STUDIES		0805	HIGHER EDUCATION, GENERAL
0301	ASIAN STUDIES, GENERAL	0806	JUNIOR AND COMMUNITY COLLEGE EDUCATION
0302	EAST ASIAN STUDIES	0807	ADULT AND CONTINUING EDUCATION
0303	SOUTH ASIAN (INDIA, ETC.) STUDIES	0808	SPECIAL EDUCATION, GENERAL
0304	SOUTHEAST ASIAN STUDIES	0809	ADMINISTRATION OF SPECIAL EDUCATION
0305	AFRICAN STUDIES	0810	EDUCATION OF THE MENTALLY RETARDED
0306	ISLAMIC STUDIES	0811	EDUCATION OF THE GIFTED
0307	RUSSIAN AND SLAVIC STUDIES	0812	EDUCATION OF THE DEAF
0308	LATIN AMERICAN STUDIES	0813	EDUCATION OF THE CULTURALLY DISADVANTAGED
0309	MIDDLE EASTERN STUDIES	0814	EDUCATION OF THE VISUALLY HANDICAPPED
0310	EUROPEAN STUDIES, GENERAL	0815	SPEECH CORRECTION
0311	EASTERN EUROPEAN STUDIES	0816	EDUCATION OF THE EMOTIONALLY DISTURBED
0312	WEST EUROPEAN STUDIES	0817	REMEDIAL EDUCATION
0313	AMERICAN STUDIES	0818	SPECIAL LEARNING DISABILITIES
0314	PACIFIC AREA STUDIES	0819	EDUCATION OF THE PHYSICALLY HANDICAPPED
0399	OTHER	0820	EDUCATION OF THE MULTIPLE HANDICAPPED
0400 BIOLOGICAL SCIENCES		0821	SOCIAL FOUNDATIONS
0401	BIOLOGY, GENERAL	0822	EDUCATIONAL PSYCHOLOGY
0402	BOTANY, GENERAL	0823	PRE-ELEMENTARY EDUCATION
0403	BACTERIOLOGY	0824	EDUCATIONAL STATISTICS AND RESEARCH
0404	PLANT PATHOLOGY	0825	EDUCATIONAL TESTING, EVALUATION AND MEASUREMENT
0405	PLANT PHARMACOLOGY		
		0826	STUDENT PERSONNEL
0406	PLANT PHYSIOLOGY	0827	EDUCATIONAL ADMINISTRATION
0407	ZOOLOGY, GENERAL	0828	EDUCATIONAL SUPERVISION
0408	PATHOLOGY, HUMAN AND ANIMAL	0829	CURRICULUM AND INSTRUCTION
0409	PHARMACOLOGY, HUMAN AND ANIMAL	0830	READING EDUCATION
0410	PHYSIOLOGY, HUMAN AND ANIMAL		
		0831	ART EDUCATION
0411	MICROBIOLOGY	0832	MUSIC EDUCATION
0412	ANATOMY	0833	MATHEMATICS EDUCATION
0413	HISTOLOGY	0834	SCIENCE EDUCATION
0414	BIOCHEMISTRY	0835	PHYSICAL EDUCATION
0415	BIOPHYSICS		
		0836	DRIVER AND SAFETY EDUCATION
0416	MOLECULAR BIOLOGY	0837	HEALTH EDUCATION
0417	CELL BIOLOGY	0838	BUSINESS, COMMERCE, AND DISTRIBUTIVE EDUCATION
0418	MARINE BIOLOGY	0839	INDUSTRIAL ARTS, VOCATIONAL & TECHNICAL EDUCATION
0419	BIOMETRICS AND BIostatISTICS	0899-1	AGRICULTURAL EDUCATION
0420	ECOLOGICAL	0899-2	EDUC. OF EXCEPTIONAL CHILDREN, NOT CLASSIFIED ABOVE
		0899-3	HOME ECONOMICS EDUCATION
0421	ENTOMOLOGY	0899-4	NURSING EDUCATION
0422	GENETICS	0899	OTHER
0423	RADIOBIOLOGY		
0424	NUTRITION, SCIENTIFIC	0900 ENGINEERING	
0425	NEUROSCIENCES	0901	ENGINEERING, GENERAL
		0902	AEROSPACE, AERONAUTICAL, ASTRONAUTICAL ENGR.
0426	TOXICOLOGY	0903	AGRICULTURAL ENGINEERING
0427	EMBRYOLOGY	0904	ARCHITECTURAL ENGINEERING
0499	OTHER	0905	BIOENGINEERING / NO BIOMEDICAL ENGINEERING
0501	BUSINESS AND COMMERCE, GENERAL	0906	CHEMICAL ENGINEERING
0502	ACCOUNTING	0907	PETROLEUM ENGINEERING
0503	BUSINESS STATISTICS	0908	CIVIL, CONSTRUCTION, & TRANSPORTATION ENGINEERING
0504	BANKING AND FINANCE	0909	ELECTRICAL, ELECTRONICS, COMMUNICATIONS ENGR.
0505	INVESTMENTS AND SECURITIES	0910	MECHANICAL ENGINEERING
0506	BUSINESS MANAGEMENT AND ADMINISTRATION	0911	GEOLOGICAL ENGINEERING
0507	OPERATIONS RESEARCH	0912	GEOPHYSICAL ENGINEERING
0508	HOTEL AND RESTAURANT MANAGEMENT	0913	INDUSTRIAL AND MANAGEMENT ENGINEERING
0509	MARKETING AND PURCHASING	0914	METALLURGICAL ENGINEERING
0510	TRANSPORTATION AND PUBLIC UTILITIES		

Source: Earned Degrees Conferred, National Center for Education Statistics, U.S. Department of Education

0900 ENGINEERING

0915 MATERIALS ENGINEERING
 0916 CERAMIC ENGINEERING
 0917 TEXTILE ENGINEERING
 0918 MINING AND MINERAL ENGINEERING
 0919 ENGINEERING PHYSICS
 0920 NUCLEAR ENGINEERING
 0921 ENGINEERING MECHANICS
 0922 ENVIRONMENTAL AND SANITARY ENGINEERING
 0923 NAVAL ARCHITECTURE AND MARINE ENGINEERING
 0924 OCEAN ENGINEERING
 0925 ENGINEERING TECHNOLOGIES
 0999 OTHER

1000 FINE AND APPLIED ARTS

1001 FINE ARTS, GENERAL
 1002 ART
 1003 ART HISTORY AND APPRECIATION
 1004 MUSIC (PERFORMING, COMPOSITION, THEORY)
 1005 MUSIC (LIBERAL ARTS PROGRAM)
 1006 MUSIC HISTORY AND APPRECIATION
 1007 DRAMATIC ARTS
 1008 DANCE
 1009 APPLIED DESIGN
 1010 CINEMATOGRAPHY
 1011 PHOTOGRAPHY
 1099 OTHER

1100 FOREIGN LANGUAGES

1101 FOREIGN LANGUAGES, GENERAL
 1102 FRENCH
 1103 GERMAN
 1104 ITALIAN
 1105 SPANISH
 1106 RUSSIAN
 1107 CHINESE
 1108 JAPANESE
 1109 LATIN
 1110 GREEK, CLASSICAL
 1111 HEBREW
 1112 ARABIC
 1113 INDIAN (ASIATIC)
 1114 SCANDINAVIAN LANGUAGES
 1115 SLAVIC LANGUAGES (OTHER THAN RUSSIAN)
 1116 AFRICAN LANGUAGES (NON-SEMATIC)
 1199 OTHER

1200 HEALTH PROFESSIONS

1201 HEALTH PROFESSIONS, GENERAL
 1202 HOSPITAL AND HEALTH CARE ADMINISTRATION
 1203 NURSING
 1205 DENTAL SPECIALTIES
 1207 MEDICAL SPECIALTIES
 1208 OCCUPATIONAL THERAPY
 1209-2 OPTOMETRY
 1211-2 PHARMACY
 1212 PHYSICAL THERAPY
 1213 DENTAL HYGIENE
 1214 PUBLIC HEALTH
 1215 MEDICAL RECORD LIBRARIANSHIP
 1216-2 PODIATRY OR PODIATRIC MEDICINE
 1217 BIOMEDICAL COMMUNICATION
 1219 VETERINARY MEDICINE SPECIALTIES
 1220 SPEECH PATHOLOGY AND AUDIOLOGY
 1221-2 CHIROPRACTIC
 1222 CLINICAL SOCIAL WORK
 1223 MEDICAL LABORATORY TECHNOLOGIES
 1224 DENTAL TECHNOLOGIES
 1225 RADIOLOGIC TECHNOLOGIES
 1299 OTHER

1300 HOME ECONOMICS

1301 HOME ECONOMICS, GENERAL
 1302 HOME DECORATION AND HOME EQUIPMENT
 1303 CLOTHING AND TEXTILES
 1304 CONSUMER ECONOMICS AND HOME MANAGEMENT
 1305 FAMILY RELATIONS AND CHILD DEVELOPMENT
 1306 FOODS AND NUTRITION
 1307-2 INSTITUTIONAL MANAGEMENT AND CAFETERIA MANAGEMENT
 1399 OTHER

1400 LAW

1401-2 LAW, GENERAL
 1499 OTHER

1900 LETTERS

1901 ENGLISH, GENERAL
 1902 LITERATURE, ENGLISH
 1903 COMPARATIVE LITERATURE
 1904 CLASSICS
 1905 LINGUISTICS
 1906 SPECIAL ORAL AND FORENSIC SCIENCE
 1907 CREATIVE WRITING
 1908 TEACHING OF ENGLISH AS A FOREIGN LANGUAGE
 1909 PHILOSOPHY
 1910 RELIGIOUS STUDIES
 1999 OTHER

1600 LIBRARY SCIENCE

1601 LIBRARY SCIENCE, GENERAL
 1699 OTHER

1700 MATHEMATICS

1701 MATHEMATICS, GENERAL
 1702 STATISTICS, MATHEMATICAL AND THEORETICAL
 1703 APPLIED MATHEMATICS
 1799 OTHER

1800 MILITARY SCIENCES

1801 MILITARY SCIENCE (ARMY)
 1802 NAVAL SCIENCE (NAVY, MARINES)
 1803 AEROSPACE SCIENCE (AIR FORCE)
 1899-1 MERCHANT MARINE
 1899 OTHER

1900 PHYSICAL SCIENCES

1901 PHYSICAL SCIENCES, GENERAL
 1902 PHYSICS, GENERAL
 1903 MOLECULAR PHYSICS
 1904 NUCLEAR PHYSICS
 1905 CHEMISTRY, GENERAL
 1906 INORGANIC CHEMISTRY
 1907 ORGANIC CHEMISTRY
 1908 PHYSICAL CHEMISTRY
 1909 ANALYTICAL CHEMISTRY
 1910 PHARMACEUTICAL CHEMISTRY
 1911 ASTRONOMY
 1912 ASTROPHYSICS
 1913 ATMOSPHERIC SCIENCES AND METEOROLOGY
 1914 GEOLOGY
 1915 GEOCHEMISTRY
 1916 GEOPHYSICS AND SEISMOLOGY
 1917 EARTH SCIENCES, GENERAL
 1918 PALEONTOLOGY
 1919 OCEANOGRAPHY
 1920 METALLURGY
 1999-1 OTHER EARTH SCIENCES
 1999-2 OTHER PHYSICAL SCIENCES

2000 PSYCHOLOGY

2001 PSYCHOLOGY, GENERAL
 2002 EXPERIMENTAL PSYCHOLOGY
 2003 CLINICAL PSYCHOLOGY
 2004 PSYCHOLOGY FOR COUNSELING
 2005 SOCIAL PSYCHOLOGY
 2006 PSYCHOMETRICS
 2007 STATISTICS IN PSYCHOLOGY
 2008 INDUSTRIAL PSYCHOLOGY
 2009 DEVELOPMENTAL PSYCHOLOGY
 2010 PHYSIOLOGICAL PSYCHOLOGY
 2099 OTHER

2100 PUBLIC AFFAIRS AND SERVICES

2101 COMMUNITY SERVICES, GENERAL
 2102 PUBLIC ADMINISTRATION
 2103 PARKS AND RECREATION MANAGEMENT
 2104 SOCIAL WORK AND HELPING SERVICES
 2105 LAW ENFORCEMENT AND CORRECTIONS
 2106 INTERNATIONAL PUBLIC SERVICE
 2199 OTHER

2200 SOCIAL SCIENCES

2201 SOCIAL SCIENCES, GENERAL
 2202 ANTHROPOLOGY
 2203 ARCHAEOLOGY
 2204 ECONOMICS
 2205 HISTORY
 2206 GEOGRAPHY
 2207 POLITICAL SCIENCE AND GOVERNMENT
 2208 SOCIOLOGY
 2209 CRIMINOLOGY
 2210 INTERNATIONAL RELATIONS
 2211 AFRO-AMERICAN (BLACK CULTURE) STUDIES
 2212 AMERICAN INDIAN CULTURAL STUDIES
 2213 MEXICAN - AMERICAN CULTURAL STUDIES
 2214 URBAN STUDIES
 2215 DEMOGRAPHY

2200 SOCIAL SCIENCES

2299 OTHER

2300 THEOLOGY

2301-2 THEOLOGICAL PROFESSIONS, GENERAL
 2302 RELIGIOUS MUSIC
 2303 BIBLICAL LANGUAGES
 2304 RELIGIOUS EDUCATION
 2399 OTHER

4900 INTERDISCIPLINARY STUDIES

4901 GENERAL LIBERAL ARTS AND SCIENCES
 4902 BIOLOGICAL AND PHYSICAL SCIENCES
 4903 HUMANITIES AND SOCIAL SCIENCES
 4904 ENGINEERING AND OTHER DISCIPLINES
 4999 OTHER

Appendix 4

Major field classification code groups

Bachelor's Recipients

<u>Major Field Code</u>	<u>Major Field Title</u>	<u>Number</u>
	Total.....	929,748
	Professions.....	437,154
0500-0599	Business and Management.....	162,179
0501	Business and Commerce, general.....	11,973
0502	Accounting.....	44,071
0506	Business Management and Administration.....	70,007
0509	Marketing and Purchasing.....	17,557
0503-0505, 0507-0508, 0510-0599	Other Business and Management.....	18,550
0800-0899	Education.....	138,155
0802	Elementary Education, general.....	49,627
0808-0820	Special Education.....	18,797
0835	Physical Education.....	17,437
0801, 0803-0807, 0821-0834, 0836-0899	Other Education.....	52,294
0900-0999	Engineering.....	54,421
0908	Civil.....	12,923
0909	Electrical.....	13,262
0901-0907, 0910-0999	Other.....	28,236
1200-1299	Health.....	61,294
1203	Nursing.....	31,231
1201, 1202, 1204-1299	Other.....	30,062
2100-2199	Public affairs and services.....	21,105
2104	Social work and helping services.....	9,437
2100-2103, 2106-2199, 9994, 9995, 1222	Other.....	11,668
0400-0499	Arts and sciences.....	369,423
0401	Biological sciences.....	69,039
0402-0499	Biology, general.....	40,558
	Other.....	28,481
1700-1799	Mathematics.....	13,147
1900-1999	Physical sciences.....	23,237
1905	Chemistry.....	12,087
1900-1904, 1906-1999	Other.....	11,668
2000-2099	Psychology.....	57,840
2200-2299	Social Sciences.....	118,086
2204	Economics.....	16,825
2205	History.....	30,270
2207	Political science and government... ..	27,625
2208	Sociology.....	23,827
2201-2203, 2206, 2209-2299	Other.....	19,549
1000-1099, 1100-1199, 1500-1599	Humanities.....	88,063
1000-1099	Fine and applied arts.....	38,686
1100-1199	Foreign languages.....	10,776
1500-1599	Letters.....	38,601
0100-0199	Other.....	120,668
0600-0699	Agriculture and natural resources..	17,019
0200-0299	Communications.....	28,385
1300-1399	Architecture.....	14,417
2105	Home Economics.....	17,411
0300-0399, 0700-0799, 1400-1499, 1600-1699, 1800-1899, 2300-2399, 4900-4999, 9996	Law enforcement and corrections....	18,108
9997-9999	Other.....	25,329
	Nonresponse.....	2,515