

Update on the 2004–2005 Doctoral Recipients

Introduction

The Annual Survey of the Mathematical Sciences collects information each year about degree recipients, departments, faculties, and students in the mathematical sciences at four-year colleges and universities in the United States. Information about recipients of doctoral degrees awarded between July 1, 2004, and June 30, 2005, was collected from doctorate-granting departments beginning in late spring 2005. The “2005 Annual Survey First Report” (Notices, February 2006, pages 230–45) presented survey results about 1,116 new doctoral recipients based on the data provided by the departments. Here we update this information using data obtained from 587 new doctoral recipients who responded to a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR), sent in early October 2005 to all new doctoral recipients. In addition, this report incorporates information on an additional 106 doctoral recipients from departments that responded too late to have the information included in the First Report. Finally, we present the starting salaries and other employment information from the new doctoral recipients that responded to the EENDR questionnaire.

The names and thesis titles of the 2004–2005 doctoral recipients reported on in the First Report were published in “Doctoral Degrees Conferred” (Notices, February 2006, pages 258–76). A supplemental listing of the 106 additional new doctoral recipients appears at the end of this report on pages 785–87.

Updated Employment Status of 2004–2005 Doctoral Recipients

The updated responses rates for the 2005 Survey of New Doctoral Recipients appears on the next page. The total number of departments responding in time for inclusion in this Second Report was 262; 22 more than were included in the 2005 First Report and 10 less than the number responding for inclusion in the 2004 Second Report. Definitions of the various groups surveyed in the Annual Survey can be found on page 784 of this report.

Table 1A shows the fall and final counts of doctoral recipients in the mathematical sciences awarded by U.S. institutions in each year from 1995 through 2005. This year the total number of new doctoral recipients is 1,222, up from the previous year by 141. A detailed review of the responding departments in 2004 and 2005 revealed that the departments responding in both 2004 and 2005 reported an increase of 135 new doctoral recipients; hence, the total increase from 2004 to 2005 is not significantly influenced by

differences in responding departments between the two years.

Table 1B shows trends in the number of new doctoral recipients for the past five years broken down by U.S. citizens and non-U.S. citizens. This year the number of new doctoral recipients who are U.S. citizens is 496, an increase of 37 over last year. The number of non-U.S. citizen new doctoral recipients has climbed to 726, a 17% increase over last year.

Table 1C gives a breakdown of the 1,222 doctoral degrees awarded in the mathematical sciences between July 1, 2004, and June 30, 2005, by type of degree-granting department.

Tables 2A, 2B, and 2C display updates of employment data, found in these same tables in the First Report, for the fall count of 2004–2005 doctoral recipients plus 106 additional doctoral recipients reported late. These tables are partitioned by field of thesis research, by the survey group of their degree-granting department, and by type of employer. New doctoral recipients are grouped by field of thesis using the *Mathematical Reviews* 2000 Mathematics Subject Classification list. A complete list of these groups is available on the AMS website at www.ams.org/employment/Thesis_groupings.pdf. At the time of this Second Report, the fall 2005 employment status of 1,072 of the 1,222 doctoral recipients was known.

The fall 2005 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 3.9%. Figure 1 presents the fall 1981 through fall 2005 trend in the final unemployment rate of new doctoral recipients. The counts on which these rates are determined do not include those new doctoral recipients whose fall employment status was unknown at the time of the Second Report. This year the number of recipients whose employment status was reported as unknown increased to 150 from 119 last year.

Of the 1,072 new doctoral recipients whose employment is known, 875 were employed in the U.S., 143 were employed outside the U.S., 42 were still seeking employment, and 12 were not seeking employment.

Table 2D presents the trend in the percentage of employed new doctoral recipients by type of employer for the last five years. Academic employment includes those employed by research institutes and other nonprofits. The percentage of the total employed new doctoral recipients that are in U.S. academic positions has dropped after five years of steadily increasing, and concomitantly the percentage of the total employed in U.S. nonacademic positions (U.S. government, U.S.

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Table 3A breaks down the numbers of new doctoral recipients employed in the U.S. in academic positions or in business/industry and government by degree granting group shows that the fall 2005 total number of doctoral recipients taking positions in business/industry and government is 176; this number reflects an increase of 30% over last year and is the highest number reported since fall 2002. All groups have shown an increase in number of graduates finding employment in business/industry and government, except Group I Private.

Table 3B shows that the number of new doctoral recipients taking U.S. academic positions has increased to a six-year high of 699, from 655 in 2004. Doctoral hires into U.S. academic positions are up in all groups except Groups IV (down to 53 from 66 last year), Va (down to 12 from 19 last year) and Other (down to 173 from 178 last year); the biggest percentage increases are in Group III (38%) and Group B (28%). Doctoral hires into non-U.S. academic positions increased by 18% to 127 from 108 last year.

Table 3C gives information about the production and hiring of female new doctoral recipients in the doctoral-granting departments of this survey. From Table 3C we see that the percentage of females hired ranges from a high of 43% in Group IV, followed by Group III at 34% to a low of 18% in Group II. The percentage of female new doctoral recipients produced is highest in Group IV (44%). The total percentage of females produced and hired has decreased from last year's percentages of 31% and 27%, respectively, to this year's 29% and 26%.

Updated Information about 2004–2005 Doctoral Recipients by Sex and Citizenship

Tables 3D and 3E show the sex and citizenship of the 1,222 new doctoral recipients and the fact that 875 new doctoral recipients found jobs in the U.S. this year. This is 82% of the 1,072 new doctoral recipients whose employment status was known and 86% of the 1,018 known to have jobs in fall 2005. Last year these percentages were 82% and 87%, respectively.

Sex and citizenship are known for all of the 1,222 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 496 (41%) (down from 42% last year) this is the lowest percentage of U.S. citizens in the six years that the number of doctoral recipients in the Second Report has been broken down by citizenship. Pages 235–8 of the First Report present further information related to the citizenship of the 2004–2005 new doctoral recipients.

Of the 496 U.S. citizen new doctoral recipients reported for 2004–2005, 141 are female and 355 are male. Females accounted for 28% of the U.S. citizen total (down from 33% last

Doctorates Granted Departmental Response Rates (updated April 2006)

Group I (Pu) ¹	25 of 25 including 0 with 0 degrees
Group I (Pr)	22 of 23 including 0 with 0 degrees
Group II	56 of 56 including 3 with 0 degrees
Group III	73 of 73 including 22 with 0 degrees
Group IV	66 of 87 including 1 with 0 degrees
Group Va	20 of 23 including 4 with 0 degrees

¹ For definitions of groups see page 784.

business and industry) has increased after five years of steady decreases.

Among new doctoral recipients who are employed, the percentage taking nonacademic employment

Table 1A: Doctoral Recipients: Fall and Final Counts

Year	Fall	Final
1995–1996	1098	1099
1996–1997	1123	1130
1997–1998	1163	1176
1998–1999	1133	1135
1999–2000	1119	1127
2000–2001	1008	1065
2001–2002	948	960
2002–2003	1017	1037
2003–2004	1041	1081
2004–2005	1116	1222

varied significantly by field of thesis. For those whose field of thesis is in the first three columns in Table 2A, this percentage is the lowest at 7% (down from 8%), while the percentage for those with theses in probability or statistics is the highest at 36% (up from 26% last year).

Table 1B: Doctoral Recipients: Citizenship

Year	U.S.	Non-U.S.	TOTAL
2000–2001	532	533	1065
2001–2002	428	532	960
2002–2003	499	538	1037
2003–2004	459	622	1081
2004–2005	496	726	1222

Table 1C: Doctoral Recipients by Type of Degree-Granting Department

	Department Group ¹					
	I (Pu)	I (Pr)	II	III	IV	Va
Number	266	181	222	160	301	92
Percent	22%	15%	18%	13%	25%	8%

¹ For definitions of groups see page 784.

**Table 2A: Fall 2005 Employment Status of 2004–2005 Doctoral Recipients:
Field of Thesis (updated April 2006)**

TYPE OF EMPLOYER	FIELD OF THESIS												TOTAL	
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/ Topology	Discr. Math./ Combin./ Logic/ Comp. Sci.	Probability	Statistics/ Biostat.	Applied Math.	Numerical Analysis/ Approxi- mations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/ Unknown		
Group I (Public) ¹	16	8	13	7	1	0	7	5	2	18	0	1	78	
Group I (Private)	13	4	16	6	1	1	4	1	1	9	0	0	56	
Group II	19	9	11	4	3	2	5	6	1	7	1	0	68	
Group III	3	10	1	9	1	11	2	4	1	3	1	1	47	
Group IV	0	1	1	0	3	45	2	0	0	0	0	1	53	
Group Va	1	0	0	0	0	0	4	3	2	2	0	0	12	
Master's	12	4	5	6	6	15	9	4	2	13	3	0	79	
Bachelor's	28	18	11	23	1	16	8	8	7	8	5	0	133	
Two-Year College	3	1	5	3	2	1	1	1	0	0	1	0	18	
Other Academic Dept. ²	8	2	1	6	5	57	20	7	1	11	2	0	120	
Research Institute/ Other Nonprofit	6	1	1	0	1	16	3	1	0	6	0	0	35	
Government	1	1	1	1	0	15	5	7	3	3	0	0	37	
Business and Industry	6	3	5	6	8	83	14	2	4	8	0	0	139	
Non-U.S. Academic	27	9	18	16	4	17	14	8	4	9	1	0	127	
Non-U.S. Nonacademic	2	1	0	0	3	9	0	1	0	0	0	0	16	
Not Seeking Employment	3	0	1	1	0	4	1	0	0	2	0	0	12	
Still Seeking Employment	4	2	3	9	0	9	6	1	1	7	0	0	42	
Unknown (U.S.)	13	5	8	1	0	20	13	2	4	7	0	0	73	
Unknown (non-U.S.) ³	11	3	4	3	2	33	4	4	2	10	1	0	77	
TOTAL	176	82	105	101	41	354	122	65	35	123	15	3	1222	
Column	Male	145	66	81	81	34	197	90	47	24	90	5	3	863
Subtotals	Female	31	16	24	20	7	157	32	18	11	33	10	0	359

¹ For definitions of groups see page 784.

² These are departments outside the mathematical sciences.

³ Includes those whose status is reported as "unknown" or "still seeking employment".

**Table 2B: Fall 2005 Employment Status of 2004–2005 Doctoral Recipients:
Type of Degree-Granting Department (updated April 2006)**

	TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT							TOTAL	Row Subtotals	
	Group I (Public)	Group I (Private)	Group II Math.	Group III Math.	Group IV Statistics	Group Va Applied Math.	Male		Female	
Group I (Public) ¹	36	24	9	4	0	5	78	63	15	
Group I (Private)	20	33	2	0	0	1	56	44	12	
Group II	23	15	23	3	2	2	68	56	12	
Group III	8	1	9	19	10	0	47	31	16	
Group IV	0	3	2	2	45	1	53	30	23	
Group Va	1	1	2	0	0	8	12	9	3	
Master's	17	6	25	17	8	6	79	43	36	
Bachelor's	26	9	49	33	13	3	133	100	33	
Two-Year College	3	1	7	5	0	2	18	13	5	
Other Academic Dept.	11	7	18	13	55	16	120	80	40	
Research Institute/ Other Nonprofit	7	4	6	1	16	1	35	23	12	
Government	8	2	6	2	12	7	37	20	17	
Business and Industry	13	15	17	16	67	11	139	100	39	
Non-U.S. Academic	45	28	17	13	17	7	127	96	31	
Non-U.S. Nonacademic	1	4	2	0	9	0	16	12	4	
Not Seeking Employment	2	3	1	1	4	1	12	7	5	
Still Seeking Employment	8	8	5	7	6	8	42	25	17	
Unknown (U.S.)	20	12	10	11	13	7	73	54	19	
Unknown (non-U.S.) ²	17	5	12	13	24	6	77	57	20	
TOTAL	266	181	222	160	301	92	1222	863	359	
Column	Male	212	148	172	101	168	62	863		
Subtotals	Female	54	33	50	59	133	30	359		

¹ For definitions of groups see page 784.

² These are departments outside the mathematical sciences.

³ Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2C: Field of Thesis of 2004–2005 Doctoral Recipients: by Type of Degree-Granting Department (updated April 2006)

TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT	FIELD OF THESIS											TOTAL	
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/Topology	Discr. Math./Combin./Logic/Comp. Sci.	Probability	Statistics/Biostat.	Applied Math.	Numerical Analysis/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.		Other/Unknown
Group I (Public) ¹	74	26	39	27	6	11	25	11	8	37	2	0	266
Group I (Private)	52	9	41	19	10	2	19	7	3	19	0	0	181
Group II	40	25	20	26	13	6	22	21	11	37	0	1	222
Group III	10	22	4	22	4	32	21	9	3	20	13	0	160
Group IV	0	0	0	0	4	291	3	1	0	0	0	2	301
Group Va	0	0	1	7	4	12	32	16	10	10	0	0	92
TOTAL	176	82	105	101	41	354	122	65	35	123	15	3	1222

¹ For definitions of groups see page 756.

Table 2D: Percentage of Employed New Doctoral Recipients by Type of Employer

	Employed in U.S.		Not Employed in U.S.		NUMBER EMPLOYED
	Academic ¹	Nonacademic	Academic	Nonacademic	
Fall 2001	63%	27%	9%	2 %	914
Fall 2002	67%	22%	10%	1 %	829
Fall 2003	70%	17%	12%	2 %	792
Fall 2004	72%	15%	12%	1 %	910
Fall 2005	69%	17%	12%	2 %	1018

¹ Includes Research Institutes and other non-profits.

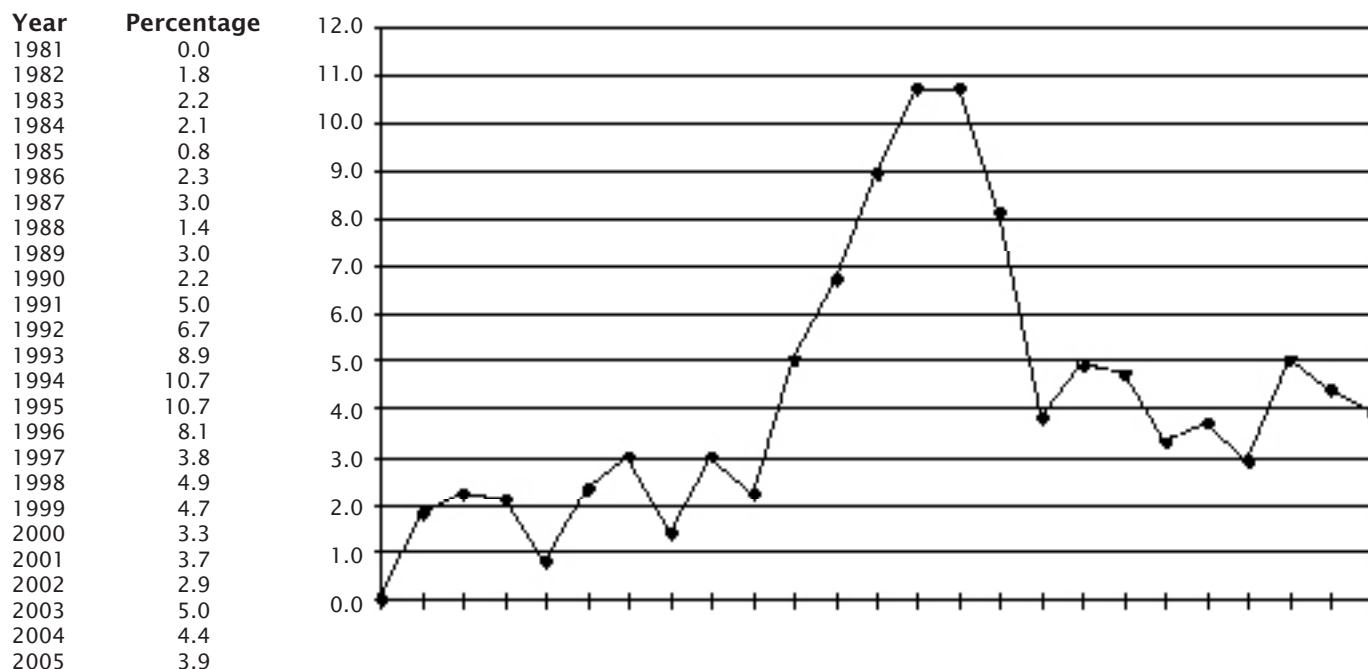
Table 3F shows that non-U.S. citizens accounted for 58% of those employed in the U.S. (the same as last year). U.S. academic doctoral departments, Groups I through Va, hired 40% U.S. citizens, while groups M, B, and all other academic departments hired 53% U.S. citizens (last year these percentages were 41% and 51%, respectively). U.S. citizens represented 41% of those hired into nonacademic positions (last year 48%). Among all the 875 new 2004–2005 doctoral recipients employed in the U.S., 20% took nonacademic employment (government or business and industry.) This percentage is up from 17% in 2003–2004 and from 19% in 2002–2003.

year); the number of female U.S. citizens has decreased by 10 from last year’s count of 151, and the number of male U.S. citizens increased by 47 over last year’s count of 308.

New Information from the EENDR Survey

Of the 1,116 new doctoral recipients reported in the First Report, the 1,104 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in

Figure 1: Percentage of New Doctoral Recipients Unemployed¹



¹ As reported in the respective Annual Survey Second Reports.

Table 3A: New Doctoral Recipients Employed in the U.S.

	Degree-Granting Department Group ¹												TOTAL	
	I (Pu)		I (Pr)		II		III		IV		Va			
	Academic ²	Business/ Industry &	Academic	Business/ Industry &	Academic	Business/ Industry &	Academic	Business/ Industry &	Academic	Business/ Industry &	Academic	Business/ Industry &	Academic	Business/ Industry &
Fall 2001	159	31	71	19	126	40	80	31	108	96	30	27	574	244
Fall 2002	133	25	86	20	107	27	91	11	102	72	34	24	553	179
Fall 2003	123	24	90	16	118	13	61	10	119	54	40	14	551	131
Fall 2004	118	18	118	18	144	17	73	11	150	61	52	11	655	137
Fall 2005	152	21	104	17	152	23	97	18	149	80	45	19	699	176

¹ For definitions of groups see page 784.² Includes Research Institutes and other non-profits.

October 2005, and 587 (53%) responded. The response rates varied considerably among the various subgroups of new doctoral recipients defined by their employment status as reported by departments. Among those who were employed the highest response rate, 70%, was from those employed in the U.S., while the lowest, 39%, was from those in non-U.S. academic.

The EENDR gathered details on employment experiences not available through departments. The remainder of this section presents additional information available on this subset of the 2004-2005 doctoral recipients.

Table 4A gives the numbers and percentages of EENDR respondents taking permanent and temporary positions in the U.S for fall 2001 through fall 2005.

This year we see that among the 523 employed in the U.S., 291 reported obtaining a permanent position and 232 a temporary position. While these numbers both reflect an increase, the number of individuals obtaining permanent positions has reached a five-year high. In addition, the percentage of individuals taking permanent positions has increased to 56%, while the percentage of those taking temporary positions has dropped to 44% (the lowest reported since 43% in 2001). Of the 232 in temporary positions, 92 (40%) reported taking temporary employment because a suitable permanent position was not available, and 172 (74%) classified their position as postdoctoral. Of the 172 respondents taking positions they classified as postdoctoral, 55 (32%) reported that a suitable permanent position was not available.

Table 4B shows the employment trends of permanent and temporary positions broken down by sector for the last five years. Following last year's pattern the percentage of permanently employed EENDR respondents taking employment in academia has declined this year, and there was an offsetting increase in the proportion of permanently employed EENDR respondents taking positions in business and industry.

Table 3B: New Doctoral Recipients Employed in U.S. Academic Positions

	Hiring Department Group ¹						TOTAL
	I-III	IV	Va	M&B	Other		
Fall 2001	214	49	11	178	122	574	
Fall 2002	222	45	10	148	128	553	
Fall 2003	216	39	9	158	129	551	
Fall 2004	220	66	19	172	178	655	
Fall 2005	249	53	12	212	173	699	

¹ For definitions of groups see page 784.

Among the 291 who reported obtaining a

Table 3C: Females as a Percentage of New Doctoral Recipients

	Department Group ¹							TOTAL
	I (Pu)	I (Pr)	II	III	IV	Va		
% Female Produced	20%	18%	23%	37%	44%	33%	29%	
Hired	19%	21%	18%	34%	43%	25%	26%	

¹ For definitions of groups see page 784.

permanent position in the U.S. in fall 2005, 68% were employed in academia (including less than 1% in research institutes and other nonprofits), 5% in government, and 27% in business or industry. Women held 37% of the permanent positions.

Among the 232 individuals with temporary employment in the U.S. this year, 96% were employed in academia (including 9% in research institutes and other nonprofits), 4% in government, and less than 1% in business or industry.

Figure 2 gives the age distribution of the 574 new doctoral recipients who responded to this question. The median age of new doctoral recipients was 30 years, while the mean age was 32 years. The first and third quartiles were 28 and 34 years, respectively.

Table 3D: Citizenship of 2004–2005 Male Doctoral Recipients by Fall 2005 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL MALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	283	50	270	9	612
U.S. Academic	233	33	219	7	492
Groups ¹ I, II, III, and Va	92	13	94	4	203
Group IV	6	1	23	0	30
Non-Ph.D. Department	126	16	91	3	236
Research Institute/Other Nonprofit	9	3	11	0	23
U.S. Nonacademic	50	17	51	2	120
Non-U.S. Employer	21	1	71	15	108
Non-U.S. Academic	20	1	65	10	96
Non-U.S. Nonacademic	1	0	6	5	12
Not Seeking Employment	5	0	2	0	7
Still Seeking Employment	5	3	17	0	25
Subtotal	314	54	360	24	752
Unknown (U.S.)	37	1	10	6	54
Unknown (non-U.S.) ²	4	2	41	10	57
TOTAL	355	57	411	40	863

¹ For definitions of groups see page 784.² Includes those whose status is reported as "unknown" or "still seeking employment".**Table 3E: Citizenship of 2004–2005 Female Doctoral Recipients by Fall 2005 Employment Status**

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL FEMALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	117	32	111	3	263
U.S. Academic	95	26	84	2	207
Groups ¹ I, II, III, and Va	21	9	27	1	58
Group IV	6	3	14	0	23
Non-Ph.D. Department	65	11	37	1	114
Research Institute/Other Nonprofit	3	3	6	0	12
U.S. Nonacademic	22	6	27	1	56
Non-U.S. Employer	3	1	23	8	35
Non-U.S. Academic	2	1	21	7	31
Non-U.S. Nonacademic	1	0	2	1	4
Not Seeking Employment	5	0	0	0	5
Still Seeking Employment	4	2	11	0	17
Subtotal	129	35	145	11	320
Unknown (U.S.)	10	4	3	2	19
Unknown (non-U.S.) ²	2	0	15	3	20
TOTAL	141	39	163	16	359

¹ For definitions of groups see page 784.² Includes those whose status is reported as "unknown" or "still seeking employment".**Table 3F: Number of New Doctoral Recipients Employed in the U.S. by Citizenship and Type of Employer**

U.S. EMPLOYER	CITIZENSHIP		TOTAL
	U.S.	Non-U.S.	
Academic, Groups I–Va	125	189	314
Academic, M&B, Other	203	182	385
Nonacademic	72	104	176
TOTAL	400	475	875

Table 4A: Number (and Percentage) of Annual EENDR Respondents Employed in the U.S. by Job Status

	Employed in U.S.					
	Permanent Total	Temporary Total	Permanent not available	Temporary		Unknown
				Postdoctoral		
				Total	Permanent	
Fall 2001	266(56%)	205(43%)	107(52%)	143(70%)	42(29%)	2
Fall 2002	264(52%)	245(48%)	90(37%)	203(83%)	69(34%)	1
Fall 2003	253(54%)	216(46%)	87(40%)	164(76%)	53(32%)	--
Fall 2004	220(49%)	229(51%)	81(35%)	176(77%)	49(28%)	--
Fall 2005	291(56%)	232(44%)	92(40%)	172(74%)	55(32%)	--

Table 4B: Percentage of Annual EENDR Respondents Employed in the U.S. by Employment Sector within Job Status

	Employed in U.S.					
	Permanent			Temporary		
	Academic ¹	Government	Business/Industry	Academic	Government	Business/Industry
Fall 2001	62%	6%	32%	95%	4%	--
Fall 2002	70%	6%	23%	93%	6%	1%
Fall 2003	76%	4%	20%	94%	3%	3%
Fall 2004	72%	5%	23%	97%	3%	--
Fall 2005	68%	5%	27%	96%	4%	--

¹ Includes Research Institutes and other non-profits.

Figure 2: Age Distribution of 2004–2005 EENDR Respondents