

Update on the 2005–2006 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, 2005, and June 30, 2006, was collected from doctorate-granting departments beginning in late spring 2006. The “2006 Annual Survey First Report” (Notices, February 2007, pages 252–67) presented survey results about 1,245 new doctoral recipients based on the data provided by the departments. Here we update this information using data obtained from 660 new doctoral recipients who responded to a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR), sent in early October 2006 to all new doctoral recipients. In addition, this report incorporates information on an additional 66 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 2005–2006 doctoral recipients reported on in the First Report were published in “Doctoral Degrees Conferred” (Notices, February 2007, pages 277–97). A supplemental listing of the 66 additional new doctoral recipients appears at the end of this report on pages 888–89.

Updated Employment Status of 2005–2006 Doctoral Recipients

The updated responses rates for the 2006 Survey of New Doctoral Recipients appear on the next page. The total number of departments responding in time for inclusion in this Second Report was 269, 24 more than were included in the 2006 First Report and 7 more than the number responding for inclusion in the 2005 Second Report. Definitions of the various groups surveyed in the Annual Survey can be found on page 887 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 1996 through 2006. This year the total number of new doctoral recipients is 1,311, up from the previous year by 89. A detailed review of responding and non-responding departments indicates that the increase in doctoral recipients from 2005 to 2006 is not significantly influenced by differences in department response patterns.

Doctorates Granted Departmental Response Rates (updated April 2007)

Group I (Pu) ¹	25 of 25 including	0 with no degrees
Group I (Pr)	22 of 23 including	0 with no degrees
Group II	54 of 56 including	0 with no degrees
Group III	74 of 75 including	15 with no degrees
Group IV	73 of 87 including	14 with no degrees
Group Va	21 of 21 including	2 with no degrees

¹ For definitions of groups see page 887.

**Table 1A: Doctoral Recipients:
Fall and Final Counts**

Year	Fall	Final
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
2005–2006	1245	1311

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 552, an increase of 56 (11%) over last year. The number of non-U.S. citizen new doctoral recipients rose to 759, a 5% increase over last year.

Table 1C gives a breakdown of the 1,311 doctoral degrees awarded in the mathematical sciences between July 1, 2005, and June 30, 2006, 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 2005–2006 doctoral recipients plus 66 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 2006

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Table 1B: Doctoral Recipients: Citizenship

Year	U.S.	Non-U.S.	TOTAL
2001-2002	428	532	960
2002-2003	499	538	1037
2003-2004	459	622	1081
2004-2005	496	726	1222
2005-2006	552	759	1311

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

	Department Group ¹					
	I (Pu)	I (Pr)	II	III	IV	Va
Number	307	184	224	150	327	119
Percent	23%	14%	17%	11%	25%	9%

¹ For definitions of groups see page 887.

employment status of 1,148 of the 1,311 doctoral recipients was known.

The fall 2006 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 3.3%. Figure 1 presents the fall 1982 through fall 2006 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 163 from 150 last year.

Of the 1,148 new doctoral recipients whose employment is known, 958 were employed in the U.S., 141 were employed outside the U.S., 38 were still seeking employment, and 11 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 for

Table 2A: Fall 2006 Employment Status of 2005-2006 Doctoral Recipients by Field of Thesis (updated April 2007)

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/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/Unknown	
Group I (Public) ¹	14	9	11	7	0	1	6	8	1	12	1	1	71
Group I (Private)	17	5	16	3	7	2	6	7	1	11	0	0	75
Group II	18	14	4	6	5	3	6	6	2	10	0	0	74
Group III	7	1	4	5	3	9	4	1	0	7	2	0	43
Group IV	0	0	0	0	7	63	1	1	0	0	1	0	73
Group Va	0	0	1	1	1	1	3	6	1	0	0	0	14
Master's	12	3	4	6	3	14	2	4	1	6	3	0	58
Bachelor's	38	12	21	12	7	11	10	7	2	15	5	0	140
Two-Year College	3	2	0	1	2	2	1	1	2	1	2	1	18
Other Academic Dept. ²	3	5	3	7	2	52	23	4	1	9	1	3	113
Research Institute/Other Nonprofit	8	0	3	3	1	12	5	1	0	3	0	0	36
Government	4	2	0	2	1	13	8	9	4	4	0	0	47
Business and Industry	8	7	5	11	19	108	17	9	5	6	0	1	196
Non-U.S. Academic	33	11	20	14	5	11	10	3	2	7	1	2	119
Non-U.S. Nonacademic	3	1	2	1	2	8	3	0	1	1	0	0	22
Not Seeking Employment	3	1	0	1	0	1	2	0	1	1	1	0	11
Still Seeking Employment	6	3	3	5	1	4	5	3	0	8	0	0	38
Unknown (U.S.)	7	3	5	2	3	18	17	3	1	4	1	0	64
Unknown (non-U.S.) ³	6	3	6	2	1	39	21	11	1	7	0	2	99
TOTAL	190	82	108	89	70	372	150	84	26	112	18	10	1311
Column Subtotals	Male	152	64	85	62	54	200	101	61	21	79	8	889
	Female	38	18	23	27	16	172	49	23	5	33	10	422

¹ For definitions of groups see page 887.

² These are departments outside the mathematical sciences.

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

Table 2B: Fall 2006 Employment Status of 2005–2006 Doctoral Recipients by Type of Degree-Granting Department (updated April 2007)

TYPE OF EMPLOYER	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	35	17	14	0	0	5	71	59	12
Group I (Private)	25	36	4	0	3	7	75	62	13
Group II	29	13	18	3	4	7	74	55	19
Group III	7	3	6	19	6	2	43	30	13
Group IV	3	0	1	2	65	2	73	42	31
Group Va	1	3	0	0	0	10	14	8	6
Master's	7	3	22	18	7	1	58	39	19
Bachelor's	41	14	42	30	7	6	140	101	39
Two-Year College	2	1	6	6	0	3	18	12	6
Other Academic Dept. ²	14	11	9	15	52	12	113	71	42
Research Institute/ Other Nonprofit	7	8	6	0	11	4	36	17	19
Government	7	4	11	2	12	11	47	31	16
Business and Industry	34	17	21	13	92	19	196	120	76
Non-U.S. Academic	39	26	25	15	9	5	119	91	28
Non-U.S. Nonacademic	8	4	1	1	7	1	22	16	6
Not Seeking Employment	0	3	3	1	1	3	11	4	7
Still Seeking Employment	6	8	9	8	3	4	38	29	9
Unknown (U.S.)	19	3	12	8	17	5	64	46	18
Unknown (non-U.S.) ³	23	10	14	9	31	12	99	56	43
TOTAL	307	184	224	150	327	119	1311	889	422
Column Subtotals	Male	Female							
	232	147	164	99	173	74	889		
	75	37	60	51	154	45	422		

¹ For definitions of groups see page 887.

² These are departments outside the mathematical sciences.

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

the second consecutive year and concomitantly the percentage of the total employed in U.S. nonacademic positions (U.S. government, U.S. business and industry) has increased for the second consecutive year.

Among new doctoral recipients who are employed in the U.S., the percentage taking nonacademic employment 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 10% (up from 7% last year), while the percentage for those with theses in probability or statistics is the highest at 40% (up from 36% last year).

Table 3A shows that the fall 2006 total number of doctoral recipients taking positions in business/industry and government is 243. This number reflects an increase of 38% over last year. All groups have shown an increase in the number of graduates finding employment in business/industry and government except Group III.

Table 3B shows that the number of new doctoral recipients taking U.S. academic positions has increased to 715, from 699 in 2005. Doctoral hires into U.S. academic positions are up in all groups except Groups M&B (down to 198 from 212 last year) and Other (down to

167 from 173 last year). The biggest percentage increase is in Group IV (38%). Doctoral hires into non-U.S. academic positions decreased by 6% to 119 from 127 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 Va, followed by Group IV at 42% to a low of 17% in both Groups I (Pu) and 1 (Pr). The percentage of female new doctoral recipients produced is highest in Group IV (47%). The total percentage of females produced and hired has increased from last year's percentages of 29% and 26%, respectively, to this year's 32% and 27%.

Updated Information about 2005–2006 Doctoral Recipients by Sex and Citizenship

Tables 3D and 3E show the sex and citizenship of the 1,311 new doctoral recipients and the fact that 958 new doctoral recipients found jobs in the U.S. this year. This is 83% of the 1,148 new doctoral recipients whose employment status was known and 87% of the 1,099 known to have jobs in fall 2006. Last year these percentages were 82% and 86%, respectively.

Sex and citizenship are known for all of the 1,311 new doctoral recipients. The final count of

Table 2C: Degree-Granting Department of 2005–2006 Doctoral Recipients by Field of Thesis (updated April 2007)

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	84	25	42	22	26	10	28	16	4	44	3	3	307
Group I (Private)	51	11	31	20	12	4	30	7	1	17	0	0	184
Group II	36	34	22	18	9	10	35	22	11	23	3	1	224
Group III	18	11	11	21	3	29	15	14	1	14	11	2	150
Group IV	0	0	0	1	10	304	9	1	0	0	0	2	327
Group Va	1	1	2	7	10	15	33	24	9	14	1	2	119
TOTAL	190	82	108	89	70	372	150	84	26	112	18	10	1311

¹ For definitions of groups see page 887.

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 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
Fall 2006	65%	22%	11%	2%	1099

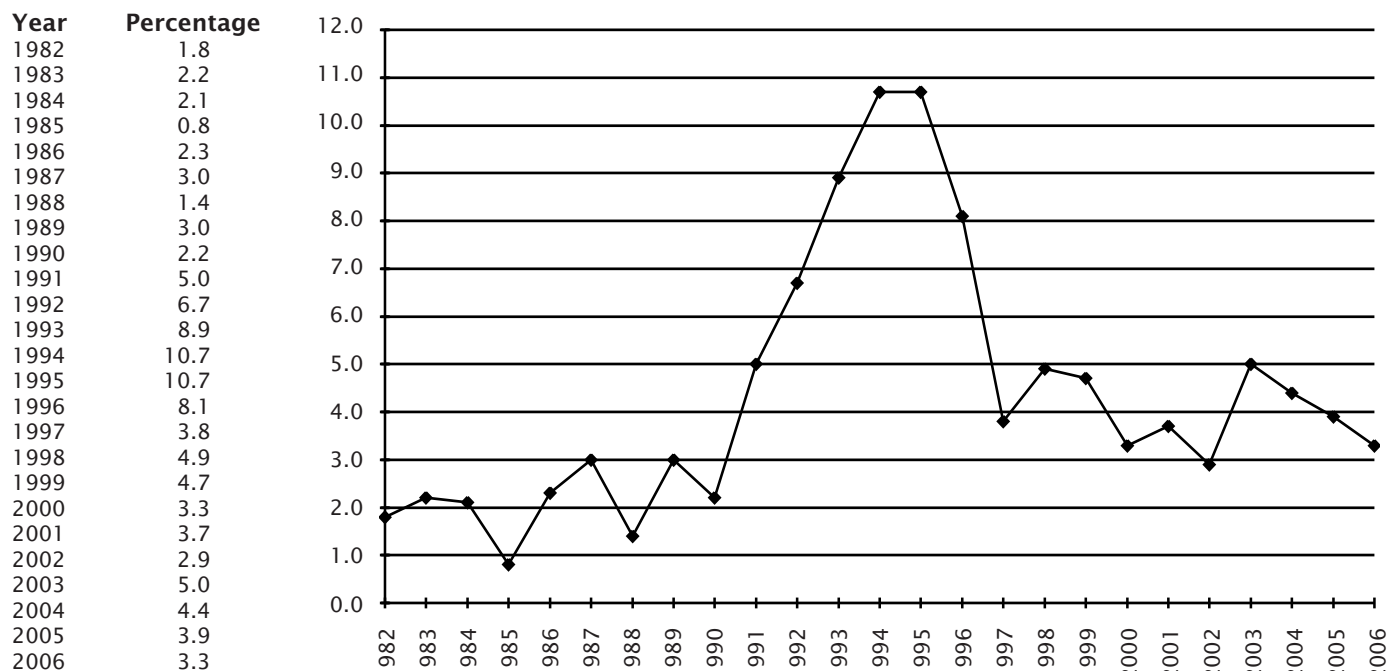
¹ Includes Research Institutes and other non-profits.

new doctoral recipients who are U.S. citizens is 552 (42%) (up from 41% last year). Pages 235–8 of the First Report present further information related to the citizenship of the 2005–2006 new doctoral recipients.

Of the 552 U.S. citizen new doctoral recipients reported for 2005–2006, 153 are female and 399 are male. Females accounted for 27% of the U.S. citizen total (down from 28% last year). The number of female U.S. citizens has increased by 12 from last year’s count of 141, and the number of male U.S. citizens increased by 44 over last year’s count of 355.

Table 3F shows that U.S. citizens accounted for 46% of those employed in the U.S. (up from 42% last year). U.S. academic doctoral departments, Groups I through Va, hired 42% U.S. citizens, while groups M, B, and all other academic departments hired 54% U.S. citizens (last year these percentages were 40%

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 & Government	Academic	Business/ Industry & Government	Academic	Business/ Industry & Government	Academic	Business/ Industry & Government	Academic	Business/ Industry & Government	Academic	Business/ Industry & Government	Academic	Business/ Industry & Government
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	79	45	18	699	176
Fall 2006	171	41	109	21	128	32	93	15	155	104	59	30	715	243

¹ For definitions of groups see page 887.² Includes Research Institutes and other non-profits.**Table 3B: New Doctoral Recipients Employed in U.S. Academic Positions**

	Hiring Department Group ¹						TOTAL
	I-III	IV	Va	M&B	Other		
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	
Fall 2006	263	73	14	198	167	715	

¹ For definitions of groups see page 887.

and 53%, respectively). U.S. citizens represented 39% of those hired into nonacademic positions (last year 41%). Among all the 958 new 2005–2006 doctoral recipients employed in the U.S., 25% took nonacademic employment (government or business and industry.) This percentage is up from 20% in 2004–2005 and from 17% in 2003–2004.

New Information from the EENDR Survey

Of the 1,245 new doctoral recipients reported in the First Report, the 1,209 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October 2006, and 660 (55%) 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, 63%, was from those employed in the U.S. academic, while the lowest, 45%, 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 2005–2006 doctoral recipients.

Table 4A gives the numbers and percentages of EENDR respondents taking permanent and temporary positions in the U.S. for fall 2002 through fall 2006.

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

	Department Group ¹							TOTAL
	I (Pu)	I(Pr)	II	III	IV	Va		
% Female								
Produced	24%	20%	27%	34%	47%	38%	32%	
Hired	17%	17%	26%	30%	42%	43%	27%	

¹ For definitions of groups see page 887.

This year we see that among the 563 employed in the U.S., 289 reported obtaining a permanent position and 274 a temporary position. While these numbers both reflect an increase, the percentage of individuals taking permanent positions in 2006 has decreased to 51% from 56% in 2005, and the percentage of those taking temporary positions has increased to 49% from 44% (the highest reported since 51% in 2004). Of the 274 in temporary positions, 98 (36%) reported taking temporary employment because a suitable permanent position was not available, and 209 (76%) classified their position as postdoctoral. Of the 209 respondents taking positions they classified as postdoctoral, 57 (27%) 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 and government has declined this year, and there was an offsetting increase in the proportion of permanently employed EENDR respondents taking positions in business and industry.

Among the 289 who reported obtaining a permanent position in the U.S. in fall 2006, 66% were employed in academia (including 1% in research

Table 3D: Citizenship of 2005–2006 Male Doctoral Recipients by Fall 2006 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	313	40	283	11	647
U.S. Academic	250	29	211	6	496
Groups ¹ I, II, III, and Va	96	15	100	3	214
Group IV	17	6	19	0	42
Non-Ph.D. Department	128	7	85	3	223
Research Institute/Other Nonprofit	9	1	7	0	17
U.S. Nonacademic	63	11	72	5	151
Non-U.S. Employer	28	7	72	0	107
Non-U.S. Academic	28	6	57	0	91
Non-U.S. Nonacademic	0	1	15	0	16
Not Seeking Employment	3	0	1	0	4
Still Seeking Employment	18	1	10	0	29
Subtotal	362	48	366	11	787
Unknown (U.S.)	34	5	7	0	46
Unknown (non-U.S.) ²	3	0	51	2	56
TOTAL	399	53	424	13	889

¹ For definitions of groups see page 887.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Table 3E: Citizenship of 2005–2006 Female Doctoral Recipients by Fall 2006 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	124	33	145	9	311
U.S. Academic	93	24	97	5	219
Groups ¹ I, II, III, and Va	23	9	31	0	63
Group IV	11	4	13	3	31
Non-Ph.D. Department	53	9	42	1	106
Research Institute/Other Nonprofit	6	2	10	1	19
U.S. Nonacademic	31	9	48	4	92
Non-U.S. Employer	8	3	22	0	34
Non-U.S. Academic	8	1	19	0	28
Non-U.S. Nonacademic	0	2	3	0	6
Not Seeking Employment	3	1	3	0	7
Still Seeking Employment	5	1	3	0	9
Subtotal	140	38	173	10	361
Unknown (U.S.)	13	2	3	0	18
Unknown (non-U.S.) ²	0	0	42	1	43
TOTAL	153	40	218	11	422

¹ For definitions of groups see page 887.

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	147	203	350
Academic: M&B, Other	196	169	365
Nonacademic	94	149	243
TOTAL	437	521	958

institutes and other nonprofits), 4% in government, and 30% in business or industry. Women held 39% of the permanent positions.

Among the 274 individuals with temporary employment in the U.S. this year, 93% were employed in academia (including 9% in research institutes and other nonprofits), 5% in government, and 2% in business or industry.

Figure 2 gives the age distribution of the 647 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 33 years, respectively.

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	Temporary			Unknown
			Permanent not available	Postdoctoral		
				Total	Permanent not available	
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%)	--
Fall 2006	289(51%)	274(49%)	98(36%)	209(76%)	57(27%)	--

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 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%	--
Fall 2006	66%	4%	30%	93%	5%	2%

¹ Includes Research Institutes and other non-profits.

Figure 2: Age Distribution of 2005–2006 EENDR Respondents

