

Appendix Table D.1a  
**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: All Fields**

Group		Fiscal Year of Doctorate						Total
		1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>NRSA</b>	Median	5.76	6.00	6.17	6.50	6.50	6.58	6.25
	Mean	5.95	6.28	6.45	6.71	6.82	6.82	6.51
	Std	1.38	1.48	1.58	1.71	1.75	1.71	1.64
	N	1,722	1,923	1,908	1,889	1,746	1,897	11,143
<b>NIH training institutions</b>	Median	6.17	6.50	6.50	6.59	6.59	6.92	6.50
	Mean	6.52	6.72	6.83	6.96	7.00	7.21	6.87
	Std	1.79	1.92	1.93	2.00	2.04	2.07	1.97
	N	2,404	2,175	2,238	2,374	2,300	2,286	13,795
<b>Non-NIH training institutions</b>	Median	6.09	6.50	6.83	6.83	7.00	7.00	6.59
	Mean	6.49	6.75	7.10	7.12	7.32	7.28	7.01
	Std	1.87	1.92	2.08	2.15	2.24	2.21	2.11
	N	2,230	2,178	1,935	2,066	2,099	2,505	13,045
<b>Total, all groups</b>	Median	6.00	6.25	6.50	6.58	6.67	6.75	6.50
	Mean	6.35	6.59	6.80	6.94	7.05	7.13	6.81
	Std	1.74	1.81	1.90	1.98	2.05	2.04	1.94
	N	6,356	6,276	6,082	6,329	6,145	6,688	37,875

Appendix Table D.1a (continued)  
**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: All Fields**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
NRSA vs. NIH training institutions	<i>0.36<sup>c</sup></i>	<i>0.26<sup>c</sup></i>	<i>0.21<sup>c</sup></i>	0.13 <sup>c</sup>	0.09 <sup>b</sup>	<i>0.21<sup>c</sup></i>	<i>0.20<sup>b</sup></i>
NRSA vs. non-NIH training institutions	<i>0.33<sup>c</sup></i>	<i>0.28<sup>c</sup></i>	<i>0.35<sup>c</sup></i>	<i>0.21<sup>c</sup></i>	<i>0.25<sup>c</sup></i>	<i>0.23<sup>c</sup></i>	<i>0.26<sup>b</sup></i>
NIH vs. non-NIH training institutions	0.01	0.02	0.13 <sup>c</sup>	0.08 <sup>b</sup>	0.15 <sup>c</sup>	0.03	0.07 <sup>b</sup>

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Individuals whose registered time exceeded three standard deviations from the mean for their respective Ph.D. cohort were excluded from the analysis so as to reduce the effect of outliers. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger). Because shorter registered time can be seen as a positive outcome, the effect sizes have been presented as positive for ease of interpretation.

<sup>a</sup>p < 0.05

<sup>b</sup>p < 0.01

<sup>c</sup>p < 0.001

Appendix Table D.1b

**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: Fields with Completion Times of Less than 7 Years**

Group		Fiscal Year of Doctorate						Total
		1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>NRSA</b>	Median	5.75	6.00	6.09	6.34	6.50	6.50	6.17
	Mean	5.87	6.22	6.39	6.64	6.71	6.74	6.43
	Std	1.33	1.45	1.52	1.65	1.66	1.64	1.58
	N	1,493	1,692	1,651	1,612	1,493	1,640	9,581
<b>NIH training institutions</b>	Median	6.00	6.33	6.25	6.42	6.29	6.58	6.33
	Mean	6.35	6.59	6.66	6.74	6.74	6.92	6.66
	Std	1.70	1.88	1.87	1.87	1.92	1.90	1.86
	N	1,761	1,639	1,607	1,698	1,664	1,646	10,015
<b>Non-NIH training institutions</b>	Median	6.00	6.17	6.50	6.50	6.59	6.50	6.33
	Mean	6.33	6.53	6.80	6.81	6.98	6.90	6.72
	Std	1.81	1.81	1.94	2.05	2.11	2.06	1.98
	N	1,482	1,432	1,293	1,364	1,338	1,585	8,494
<b>Total, all groups</b>	Median	6.00	6.16	6.25	6.42	6.50	6.50	6.25
	Mean	6.19	6.44	6.60	6.72	6.81	6.85	6.60
	Std	1.65	1.72	1.78	1.86	1.90	1.87	1.81
	N	4,736	4,763	4,551	4,674	4,495	4,871	28,090

Appendix Table D.1b (continued)

**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: Fields with Completion Times of Less than 7 Years**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
NRSA vs. NIH training institutions	<i>0.31<sup>c</sup></i>	<i>0.22<sup>c</sup></i>	0.16 <sup>c</sup>	0.06	0.01	0.10 <sup>b</sup>	0.13 <sup>b</sup>
NRSA vs. non-NIH training institutions	0.29 <sup>c</sup>	0.19 <sup>c</sup>	<i>0.24<sup>c</sup></i>	0.09 <sup>a</sup>	0.14 <sup>c</sup>	0.09 <sup>a</sup>	0.16 <sup>a</sup>
NIH vs. non-NIH training institutions	0.01	0.03	0.07 <sup>a</sup>	0.04	0.12 <sup>c</sup>	0.01	0.03

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Cases that exceeded three standard deviations from the mean for their respective cohort were excluded. Fields included: anatomy; bacteriology; biochemistry; bioengineering; biophysics; cell/developmental biology; endocrinology; genetics; immunology; medicinal chemistry; microbiology; molecular biology; neuroscience; nutritional sciences; pharmacology; pharmacy; physiology; toxicology; and other biological sciences. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered as moderate (between |0.50| and |0.79|), and both italics and bold typeface signify a large difference ( $\pm 0.80$  or larger). Because shorter registered time can be seen as a positive outcome, the effect sizes have been presented as positive for ease of interpretation.

<sup>a</sup>p < 0.05<sup>b</sup>p < 0.01<sup>c</sup>p < 0.001

Appendix Table D.1c  
**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: Fields with Completion Times of 7 or More Years**

Group		Fiscal Year of Doctorate						Total
		1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>NRSA</b>	Median	6.17	6.50	6.76	7.00	7.00	7.00	6.75
	Mean	6.46	6.69	6.88	7.15	7.42	7.36	7.01
	Std	1.61	1.61	1.88	1.97	2.09	1.99	1.91
	N	229	231	257	277	253	257	1,504
<b>NIH training institutions</b>	Median	6.83	6.91	7.08	7.17	7.41	7.59	7.09
	Mean	6.98	7.11	7.27	7.51	7.66	7.95	7.42
	Std	1.92	1.98	2.01	2.20	2.22	2.29	2.14
	N	643	536	631	676	636	640	3,762
<b>Non-NIH training institutions</b>	Median	6.59	7.00	7.50	7.50	7.59	7.66	7.25
	Mean	6.82	7.15	7.70	7.73	7.90	7.94	7.55
	Std	1.95	2.07	2.23	2.21	2.35	2.31	2.23
	N	748	746	642	702	761	920	4,519
<b>Total, all groups</b>	Median	6.59	6.91	7.09	7.25	7.50	7.58	7.08
	Mean	6.83	7.06	7.39	7.54	7.73	7.86	7.42
	Std	1.90	1.98	2.10	2.18	2.27	2.27	2.16
	N	1,620	1,513	1,530	1,655	1,650	1,817	9,785

Appendix Table D.1c (continued)

**Years Formally Enrolled in Graduate Study for 1981-92 Biomedical Ph.D.s: Fields with Completion Times of 7 or More Years**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
NRSA vs. NIH training institutions	<i>0.29<sup>c</sup></i>	<i>0.23<sup>b</sup></i>	<i>0.20<sup>b</sup></i>	0.17 <sup>a</sup>	0.11	<i>0.28<sup>c</sup></i>	<i>0.20<sup>c</sup></i>
NRSA vs. non-NIH training institutions	<i>0.20<sup>a</sup></i>	<i>0.25<sup>b</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.28<sup>c</sup></i>	<i>0.22<sup>b</sup></i>	<i>0.27<sup>c</sup></i>	<i>0.26<sup>c</sup></i>
NIH vs. non-NIH training institutions	0.08	0.02	0.20 <sup>c</sup>	0.10	0.10 <sup>a</sup>	0.00	0.06

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Individuals whose registered time exceeded three standard deviations from the mean for their respective Ph.D. cohort were excluded from the analysis so as to reduce the effect of outliers. Fields included: biostatistics; environmental health; environmental sciences; general biological sciences; nursing; public health; veterinary medicine; other health sciences; parasitology; pathology; and zoology. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger). Because shorter registered time can be seen as a positive outcome, the effect sizes have been presented as positive for ease of interpretation.

<sup>a</sup>p < 0.05<sup>b</sup>p < 0.01<sup>c</sup>p < 0.001

Appendix Table D.2  
**Estimated Standardized Coefficients for Regressions on  
 Time Formally Enrolled in Graduate School (RTD): 1981-92 Biomedical Ph.Ds**

Independent Variable	NRSA vs. NIH Training Institution		NRSA vs. Non-NIH Training Institution	
	Coeff.	R <sup>2</sup> Added	Coeff.	R <sup>2</sup> Added
<i>Demographic variables:</i>				
Gender (female)	-0.02 <sup>b</sup>	< 0.01	-0.01	< 0.01
Underrepresented minority	0.01 <sup>a</sup>		0.01	
Entered graduate school by age 30	0.02 <sup>b</sup>		0.02 <sup>a</sup>	
<i>Year of Ph.D.</i>	0.13 <sup>c</sup>	0.02	0.14 <sup>c</sup>	0.02
<i>Reputational ranking of educational institutions:</i>				
B.A. degree from highly selective institution	0.02 <sup>b</sup>	< 0.01	0.02 <sup>b</sup>	< 0.01
Reputational ranking of Ph.D. institution	0.06 <sup>c</sup>		0.07 <sup>c</sup>	
<i>Field of doctorate(s):</i>				
Field with traditionally longer time-to-degree	0.10 <sup>c</sup>	0.03	0.10 <sup>c</sup>	0.04
Earned a coteminous M.D./Ph.D.	0.04 <sup>c</sup>		0.04 <sup>c</sup>	
<i>Other characteristics of graduate education:</i>				
Years out between graduate school entry and Ph.D.	0.01	0.10	0.01	0.09
Master's and Ph.D. from the same institution	0.14 <sup>c</sup>		0.18 <sup>c</sup>	
Master's and Ph.D. from different institutions	0.34 <sup>c</sup>		0.33 <sup>c</sup>	
<i>Primary source of graduate support</i>				
RA	0.00	0.01	0.00	0.01
TA	0.03 <sup>c</sup>		0.04 <sup>c</sup>	
Earnings from employment	0.12 <sup>c</sup>		0.14 <sup>c</sup>	
<i>Percent of Ph.D.s in same field and cohort who:</i>				
Had definite job or postdoctoral commitments	-0.02 <sup>a</sup>	< 0.01	-0.04 <sup>c</sup>	< 0.01
Had or seeking job rather than postdoctoral study	-0.12 <sup>c</sup>		-0.09 <sup>c</sup>	
<i>NRSA predoctoral trainee or fellow</i>	-0.04 <sup>c</sup>	< 0.01	-0.04 <sup>c</sup>	< 0.01
Total R <sup>2</sup>		0.17		0.18

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, and the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995). Disciplines with median RTDs that were greater than 7 years were biostatistics, environmental health, environmental sciences, general biological sciences, nursing, parasitology, pathology, public health, veterinary medicine, and general/other health sciences. Those with shorter median RTDs were: anatomy; bacteriology; biochemistry; bioengineering; biophysics; cell/developmental biology; endocrinology; genetics; immunology; medicinal chemistry; microbiology; neuroscience; nutritional sciences; pharmacology; pharmacy; physiology; toxicology; and other biological sciences. Due to missing data, the total sample sizes were 20,268 (82% of the full sample) for the NRSA/NIH training institution comparison and 19,563 (81%) for the NRSA/Non-NIH training institution comparison. The regressions also were done on separate random samples, with similar results. Information on the unstandardized coefficients is available from the author.

<sup>a</sup>p < 0.05<sup>b</sup>p < 0.01<sup>c</sup>p < 0.001

Appendix Table D.3  
**Estimated Standardized Coefficients for Regressions on Time Formally Enrolled  
 in Graduate School (RTD): 1981-92 Biomedical Ph.D.s with NRSA Traineeships**

Independent Variable	Coeff.	R <sup>2</sup> Added
<i>Demographic variables:</i>		< 0.01
Gender (female)	0.01	
Underrepresented minority	0.01	
Entered graduate school by age 30	0.01	
<i>Year of Ph.D.</i>	0.33 <sup>c</sup>	0.03
<i>Reputational ranking of educational institutions:</i>		< 0.01
B.A. degree from a highly selective institution	0.01	
Prestige of doctoral institution (quartiles)	0.06 <sup>c</sup>	
<i>Field of doctorate(s):</i>		0.01
Ph.D. field with traditionally longer time-to-degree	0.03 <sup>b</sup>	
Received a coterminous M.D./Ph.D.	0.01	
<i>Other characteristics of graduate education:</i>		0.12
Time out between entry into graduate school and Ph.D. receipt (years)	-0.02	
Master's and Ph.D. from the same institution	0.11 <sup>c</sup>	
Master's and Ph.D. from different institution	0.39 <sup>c</sup>	
<i>Primary source of graduate support</i>		0.01
RA	0.02	
TA	0.02	
Earnings from employment	0.07 <sup>c</sup>	
<i>Percent of Ph.D.s in same field and cohort who:</i>		< 0.01
Had definite employment or postdoctoral commitments	-0.02	
Had or were still seeking employment rather than postdoctoral training	-0.03	
<i>NRSA predoctoral training characteristics:</i>		0.13
Years of NIH predoctoral support (less than or more than 3 years)	0.38 <sup>c</sup>	
NRSA support began within first 3 years of entering graduate school	-0.22 <sup>c</sup>	
Also received an NR SA predoctoral fellowship	-0.01	
Received MSTP support	0.07 <sup>c</sup>	
Number of years that training grant had been in operation	-0.23 <sup>c</sup>	
Ph.D. institution was different than that for NRSA-supported training	0.01	
Training grant was awarded to a college/school of arts and sciences	0.01	
Number of Ph.D.s supported by the training grant	0.10 <sup>c</sup>	
Training grant or fellowship viewed as primary support	-0.07 <sup>c</sup>	
Years of NIH predoctoral support x When support began	-0.22 <sup>c</sup>	
Total R <sup>2</sup>		0.31

Note. Data were from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, and the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995). Due to missing data, the total sample size was 8,841 (83% of the full trainee sample). The regressions were repeated on independent samples, with similar results. Information on the unstandardized coefficients is available from the author.

<sup>a</sup>p < 0.05    <sup>b</sup>p < 0.01    <sup>c</sup>p < 0.001

Appendix Table D.4  
**Postgraduation Plans of 1981-92 Biomedical Ph.D.s at the Time of Completing Their Doctorate**

Group	Fiscal Year of Doctorate						Total	
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92		
<b>NRSA</b>								
Total	N	1,527	1,731	1,708	1,717	1,734	1,773	10,190
Postdoctoral study commitments	%	84.8	87.5	86.4	86.8	87.3	85.4	86.4
Research employment commitments	%	12.5	10.7	11.3	10.9	10.6	12.2	11.3
Other employment commitments	%	2.7	1.8	2.3	2.3	2.1	2.4	2.3
<b>NIH training institutions</b>								
Total	N	2,028	1,775	1,912	2,008	2,140	2,030	11,893
Postdoctoral study commitments	%	68.2	68.5	65.3	66.1	67.0	68.2	67.2
Research employment commitments	%	24.4	24.8	26.2	26.5	25.0	24.8	25.3
Other employment commitments	%	7.4	6.7	8.5	7.4	7.9	7.0	7.5
<b>Non-NIH training institutions</b>								
Total	N	1,833	1,727	1,541	1,685	1,780	1,969	10,535
Postdoctoral study commitments	%	56.5	53.2	56.7	56.2	55.4	57.2	55.9
Research employment commitments	%	31.5	33.5	31.6	31.8	31.7	31.0	31.8
Other employment commitments	%	12.0	13.3	11.7	12.0	12.9	11.7	12.3
<b>Total, all groups</b>								
Total	N	5,388	5,233	5,161	5,410	5,656	5,772	32,618
Postdoctoral study commitments	%	68.9	69.7	69.7	69.6	69.6	69.8	69.5
Research employment commitments	%	23.4	23.0	22.9	23.2	22.7	23.0	23.0
Other employment commitments	%	7.7	7.3	7.4	7.2	7.7	7.2	7.5

Appendix Table D.4 (continued)  
**Postgraduation Plans of 1981-92 Biomedical Ph.D.s at the Time of Completing Their Doctorate**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
Postdoctoral study commitments							
NRSA vs. NIH training institution	<i>0.40</i>	<i>0.47</i>	<b>0.50</b>	<b>0.50</b>	<i>0.49</i>	<i>0.41</i>	<i>0.46</i>
NRSA vs. non-NIH training institution	<b>0.64</b>	<b>0.79</b>	<b>0.68</b>	<b>0.70</b>	<b>0.73</b>	<b>0.64</b>	<b>0.70</b>
NIH vs. non-NIH training institution	<i>0.24</i>	<i>0.31</i>	0.18	<i>0.20</i>	<i>0.24</i>	<i>0.23</i>	<i>0.23</i>
Research employment commitments:							
NRSA vs. NIH training institution	<i>-0.31</i>	<i>-0.38</i>	<i>-0.39</i>	<i>-0.41</i>	<i>-0.38</i>	<i>-0.33</i>	<i>-0.37</i>
NRSA vs. non-NIH training institution	<i>-0.47</i>	<b>-0.57</b>	<b>-0.51</b>	<b>-0.53</b>	<b>-0.53</b>	<i>-0.47</i>	<b>-0.51</b>
NIH vs. non-NIH training institution	<i>-0.16</i>	<i>-0.19</i>	<i>-0.12</i>	<i>-0.12</i>	<i>-0.15</i>	<i>-0.14</i>	<i>-0.15</i>
Other employment commitments:							
NRSA vs. NIH training institution	<i>-0.22</i>	<i>-0.26</i>	<i>-0.29</i>	<i>-0.24</i>	<i>-0.28</i>	<i>-0.22</i>	<i>-0.25</i>
NRSA vs. non-NIH training institution	<i>-0.38</i>	<i>-0.48</i>	<i>-0.39</i>	<i>-0.40</i>	<i>-0.44</i>	<i>-0.39</i>	<i>-0.41</i>
NIH vs. non-NIH training institution	<i>-0.16</i>	<i>-0.22</i>	<i>-0.11</i>	<i>0.16</i>	<i>-0.16</i>	<i>-0.16</i>	<i>-0.16</i>

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F315, or T32 predoctoral support and who reported having definite commitments at the time of graduation. Research employment refers to those who had obtained positions in which the expected primary or secondary work responsibility was research. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

Appendix Table D.5  
**Postgraduation Plans of 1981-92 Biomedical Ph.D.s at the Time of Completing Their Doctorate by Field Clusters**

Group	Fiscal Year of Doctorate						Total	
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92		
<b>Fields with high proportions of postdocs:</b>								
<b>  NRSA</b>								
Total	N	1,187	1,375	1,346	1,315	1,324	1,390	7,937
Postdoctoral study commitments	%	90.0	94.0	92.9	94.1	94.6	92.2	93.0
Research employment commitments	%	8.4	4.9	5.8	4.4	4.1	6.0	5.6
Other employment commitments	%	1.6	1.1	1.3	1.5	1.4	1.7	1.4
<b>  NIH training institutions</b>								
Total	N	1,338	1,178	1,172	1,186	1,345	1,265	7,484
Postdoctoral study commitments	%	81.5	83.4	83.2	84.9	86.3	85.0	84.1
Research employment commitments	%	14.5	13.3	13.6	12.3	11.1	11.7	12.7
Other employment commitments	%	4.0	3.3	3.2	2.8	2.6	3.3	3.2
<b>  Non-NIH training institutions</b>								
Total	N	1,050	893	806	854	886	988	5,477
Postdoctoral study commitments	%	77.1	77.0	79.0	80.9	81.3	82.3	79.6
Research employment commitments	%	17.8	18.8	17.6	15.7	14.2	13.3	16.2
Other employment commitments	%	5.0	4.1	3.3	3.4	4.5	4.5	4.2
<b>Fields with moderate proportions of postdocs:</b>								
<b>  NRSA</b>								
Total	N	237	253	237	264	268	236	1,495
Postdoctoral study commitments	%	82.7	76.7	77.2	81.4	83.6	80.1	80.3
Research employment commitments	%	13.1	21.3	17.7	14.8	13.4	15.5	15.9
Other employment commitments	%	4.2	2.0	5.1	3.8	3.0	4.7	3.7

Appendix Table D.5 (continued)  
**Postgraduation Plans of 1981-92 Biomedical Ph.D.s at the Time of Completing Their Doctorate by Field Clusters**

Group		Fiscal Year of Doctorate						Total
		1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>NIH training institutions</b>								
Total	N	414	329	389	433	379	375	2,319
Postdoctoral study commitments	%	61.8	59.9	60.4	61.2	57.0	65.1	60.9
Research employment commitments	%	30.9	32.8	29.6	32.1	34.6	29.9	31.6
Other employment commitments	%	7.2	7.3	10.0	6.7	8.4	5.1	7.5
<b>Non-NIH training institutions</b>								
Total	N	408	455	422	450	456	462	2,653
Postdoctoral study commitments	%	43.1	40.2	46.7	45.8	45.2	53.9	45.9
Research employment commitments	%	42.2	42.9	35.8	38.9	40.6	34.8	39.2
Other employment commitments	%	14.7	16.9	17.5	15.3	14.3	11.3	15.0
<b>Fields with low proportions of postdocs:</b>								
<b>NRSA</b>								
Total	N	103	103	125	138	142	147	758
Postdoctoral study commitments	%	30.1	28.2	32.8	27.5	26.1	29.3	28.9
Research employment commitments	%	58.3	61.2	58.4	65.2	66.2	63.3	62.4
Other employment commitments	%	11.7	10.7	8.8	7.2	7.7	7.5	8.7
<b>NIH training institutions</b>								
Total	N	276	268	351	389	416	390	2,090
Postdoctoral study commitments	%	13.4	13.4	10.8	14.1	13.7	16.9	13.8
Research employment commitments	%	62.3	65.7	64.7	63.5	61.5	62.3	63.2
Other employment commitments	%	24.3	20.9	24.5	22.4	24.8	20.8	23.0

Appendix Table D.5 (continued)  
**Postgraduation Plans of 1981-92 Biomedical Ph.D.s at the Time of Completing Their Doctorate by Field Clusters**

Group	Fiscal Year of Doctorate						Total	
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92		
<b>Non-NIH training institutions</b>								
Total	N	375	379	313	381	438	519	2,405
Postdoctoral study commitments	%	13.3	12.4	12.5	13.1	13.7	12.5	12.9
Research employment commitments	%	58.1	57.0	62.0	59.6	57.8	61.5	59.3
Other employment commitments	%	28.5	30.6	25.6	27.3	28.5	26.0	27.7

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support and who reported having definite commitments at the time of graduation. Research employment refers to those who had obtained positions in which the expected primary or secondary work responsibility was research. Fields with high proportions of postdocs included anatomy, biochemistry, biophysics, cell/developmental biology, endocrinology, genetics, immunology, microbiology/bacteriology, molecular biology, neuroscience, and physiology. Those with moderate proportions were bioengineering, general biological sciences, general health sciences, medicinal chemistry, nutritional sciences, parasitology, pathology, toxicology, zoology, and other biological sciences not previously mentioned. Biostatistics, environmental health, environmental sciences, epidemiology, nursing, pharmacy, public health, rehabilitation services, veterinary medicine, and other health sciences comprised the last group.

Appendix Table D.6

**Biomedical Ph.D.s Who Were Awarded an NRSA Postdoctoral Traineeship or Fellowship Within Four Years of Doctorate Receipt**

Group		Fiscal Year of Doctorate					Total
		1981-82	1983-84	1985-86	1987-88	1989-90	
<b>NRSA</b>							
Total	N	1,866	2,079	2,062	2,084	2,100	10,191
NRSA postdoctoral trainee or fellow	N	819	918	807	777	735	4,056
	%	43.9	44.2	39.1	37.3	35.0	39.8
<b>NIH training institutions</b>							
Total	N	2,705	2,425	2,536	2,679	2,852	13,197
NRSA postdoctoral trainee or fellow	N	768	693	623	575	571	3,230
	%	28.4	28.6	24.6	21.5	20.0	24.5
<b>Non-NIH training institutions</b>							
Total	N	2,523	2,465	2,178	2,329	2,565	12,060
NRSA postdoctoral trainee or fellow	N	542	492	401	378	369	2,182
	%	21.5	20.0	18.4	16.2	14.4	18.1
<b>Total, all groups</b>							
Total	N	7,094	6,969	6,776	7,092	7,517	35,448
NRSA postdoctoral trainee or fellow	N	2,129	2,102	1,831	1,730	1,675	9,468
	%	30.0	30.2	27.0	24.4	22.3	26.7

Appendix Table D.6 (continued)

**Biomedical Ph.D.s Who Were Awarded an NRSA Postdoctoral Traineeship or Fellowship Within Four Years of Doctorate Receipt**

Group	Fiscal Year of Doctorate					Total
	1981-82	1983-84	1985-86	1987-88	1989-90	
<b>Effect sizes:</b>						
NRSA vs. NIH training institution	<i>0.32</i>	<i>0.33</i>	<i>0.31</i>	<i>0.35</i>	<i>0.34</i>	<i>0.33</i>
NRSA vs. non-NIH training institution	<i>0.48</i>	<b>0.53</b>	<i>0.46</i>	<i>0.48</i>	<i>0.49</i>	<i>0.49</i>
NIH vs. non-NIH training institution	0.16	<i>0.20</i>	0.15	0.13	0.15	0.16

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. To qualify as receiving an NRSA postdoctoral appointment, individuals must have: (a) had at least nine months of NRSA postdoctoral support; (b) begun it no earlier than approximately 12 months prior to the formal awarding of their last known doctoral degree (Ph.D. or M.D.); (c) begun the appointment within 4 years of this degree; and (d) had an award with the activity codes of F32, F35, and T32. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger). All pairwise group differences were statistically significant ( $p < 0.001$ ).

Appendix Table D.7  
**Biomedical Ph.Ds Who Were Awarded an NRSA Postdoctoral Traineeship  
or Fellowship Within Four Years of Doctorate Receipt by Field Cluster**

Group		Fiscal Year of Doctorate					Total
		1981-82	1983-84	1985-86	1987-88	1989-90	
<b>Fields with high proportions of postdocs</b>							
NRSA predoctoral trainees and fellows	N	1,442	1,619	1,572	1,549	1,560	7,742
With NRSA postdoctoral awards	%	46.5	47.5	43.0	42.3	39.2	43.7
Ph.D.s from NIH training institutions	N	1,691	1,503	1,480	1,484	1,694	7,852
With NRSA postdoctoral awards	%	35.5	37.7	33.5	30.2	28.2	33.0
Ph.D.s from non-NIH training institutions	N	1,354	1,192	1,055	1,080	1,152	5,833
With NRSA postdoctoral awards	%	32.2	32.5	29.3	27.5	24.5	29.3
<b>Effect sizes:</b>							
NRSA vs. NIH training institution		0.23 <sup>c</sup>	0.20 <sup>c</sup>	0.20 <sup>c</sup>	0.25 <sup>c</sup>	0.23 <sup>c</sup>	0.22 <sup>c</sup>
NRSA vs. non-NIH training institution		0.29 <sup>c</sup>	0.31 <sup>c</sup>	0.29 <sup>c</sup>	0.31 <sup>c</sup>	0.32 <sup>c</sup>	0.30 <sup>c</sup>
NIH vs. non-NIH training institution		0.07	0.11 <sup>b</sup>	0.09 <sup>a</sup>	0.06	0.08 <sup>a</sup>	0.08
<b>Fields with medium proportions of postdocs</b>							
NRSA predoctoral trainees and fellows	N	288	316	317	345	342	1,608
With NRSA postdoctoral awards	%	44.4	41.5	33.1	29.6	30.4	35.4
Ph.D.s from NIH training institutions	N	614	524	565	647	575	2,925
With NRSA postdoctoral awards	%	23.5	18.7	19.1	16.5	12.9	18.2
Ph.D.s from non-NIH training institutions	N	652	742	670	706	3,485	5,833
With NRSA postdoctoral awards	%	13.2	11.1	12.1	9.4	8.9	10.9

Appendix Table D.7 (continued)  
**Biomedical Ph.D. Recipients Who Were Awarded an NRSA Postdoctoral Traineeship  
 or Fellowship Within Four Years of Doctorate Receipt by Field Cluster**

Group	Fiscal Year of Doctorate					
	1981-82	1983-84	1985-86	1987-88	1989-90	Total
<b>Fields with medium proportions of postdocs</b>						
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions	<i>0.45<sup>c</sup></i>	<i>0.50<sup>c</sup></i>	<i>0.32<sup>c</sup></i>	<i>0.31<sup>c</sup></i>	<i>0.43<sup>c</sup></i>	<i>0.40<sup>c</sup></i>
NRSA vs. non-NIH training institutions	<b>0.72<sup>c</sup></b>	<b>0.72<sup>c</sup></b>	<b>0.52<sup>c</sup></b>	<b>0.53<sup>c</sup></b>	<b>0.56<sup>c</sup></b>	<b>0.60<sup>c</sup></b>
NIH vs. non-NIH training institutions	<i>0.27<sup>c</sup></i>	<i>0.22<sup>c</sup></i>	<i>0.19<sup>c</sup></i>	<i>0.22<sup>c</sup></i>	<i>0.13<sup>a</sup></i>	<i>0.21<sup>c</sup></i>
<b>Fields with low proportions of postdocs</b>						
NRSA predoctoral trainees and fellows	N	136	144	173	190	841
With NRSA postdoctoral awards	%	14.7	12.5	15.0	10.5	12.2
Ph.D.s from NIH training institutions	N	400	398	491	548	2,420
With NRSA postdoctoral awards	%	6.0	7.0	3.9	3.4	4.6
Ph.D.s from non-NIH training institutions	N	517	531	453	534	2,742
With NRSA postdoctoral awards	%	3.9	4.3	2.4	2.6	3.4
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions	<i>0.29<sup>c</sup></i>	<i>0.19<sup>a</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.28<sup>c</sup></i>	<i>0.26<sup>c</sup></i>	<i>0.28<sup>c</sup></i>
NRSA vs. non-NIH training institutions	<i>0.39<sup>c</sup></i>	<i>0.30<sup>c</sup></i>	<i>0.48<sup>c</sup></i>	<i>0.34<sup>c</sup></i>	<i>0.26<sup>c</sup></i>	<i>0.35<sup>c</sup></i>
NIH vs. non-NIH training institutions	0.10	0.12	0.08	0.06	0.00	0.06 <sup>a</sup>

*Note.* Sources of data were the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. To qualify as receiving an NRSA postdoctoral appointment, individuals must; (a) have had at least nine months of NRSA postdoctoral support; (b) have it being no earlier than 12 months prior to formal awarding of their last known doctoral degree (Ph.D. or M.D.); (c) have begun the appointment within 4 years of this degree; and (d) have had an award with the activity codes of F32, F35, and T32. Clusters were determined by the percent of 1981-92 Ph.D.s having definite commitments for or seeking further postdoctoral training at the time of Ph.D. receipt. Fields with high proportions of postdocs included anatomy, biochemistry, cellular, developmental, or molecular biology, endocrinology, genetics, microbiology, immunology, or bacteriology, neuroscience, physiology, or biophysics. Those with moderate concentrations of postdocs were bioengineering, general biological sciences, medicinal chemistry, nutritional sciences, pathology, parasitology, toxicology, zoology, general health sciences, and other biological sciences. Finally, fields with low proportions of postdocs were biostatistics, environmental health, environmental sciences, epidemiology, nursing, pharmacy, public health, veterinary medicine, and other health sciences. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>p < 0.05<sup>b</sup>p < 0.01<sup>c</sup>p < 0.001

Appendix Table D.8  
**NRSA Postdoctoral Appointments by Awarding Postdoctoral Institute and Percent with  
 Previous NRSA Predoctoral Traineeships and Fellowships: 1981-90 Biomedical Ph.D.s**

Institute of NRSA Postdoctoral Award	Total Number of NRSA Postdoctoral Awards to 1981-90 Biomedical Ph.D.s	Percent of NRSA Postdoctoral Awardees with:			Percent of NRSA Predoctoral Awardees with NRSA Postdocs from the Same Institute
		NRSA Predoctoral Sup- port from the Same Institute	NRSA Predoctoral Support from Another Institute	No NRSA Predoctoral Support	
NIA	135	3.0	12.6	84.4	19.1
NIAAA	55	9.1	16.4	74.5	35.7
NIAID	563	9.2	18.5	72.3	33.3
NIAMS	390	2.8	11.8	85.3	19.3
NCI	1,463	15.1	18.5	66.3	44.9
NICHD	539	7.8	24.3	67.9	24.3
NIDR	80	2.5	7.5	90.0	25.0
NIDDK	297	0.3	4.0	95.6	7.7
NIDA	71	9.9	29.5	60.6	25.0
NIEHS	412	10.9	24.8	64.3	30.6
NEI	221	6.8	10.4	82.8	39.5
NIGMS	2,971	18.6	60.2	21.2	23.6

Appendix Table D.8  
**NRSA Postdoctoral Appointments by Awarding Postdoctoral Institute and Percent with  
 Previous NRSA Predoctoral Traineeships and Fellowships: 1981-90 Biomedical Ph.D.s**

Institute of NRSA Postdoctoral Award	Total Number of NRSA Postdoctoral Awards to 1981-90 Biomedical Ph.D.s	Percent of NRSA Postdoctoral Awardees with:			Percent of NRSA Predoctoral Awardees with NRSA Postdocs from the Same Institute
		NRSA Predoctoral Sup- port from the Same Institute	NRSA Predoctoral Support from Another Institute	No NRSA Predoctoral Support	
NHLBI	1,184	12.9	9.9	77.2	56.7
NIMH	379	12.4	41.2	46.4	23.2
NINDS	642	7.8	3.9	88.3	66.7
NINR	28	35.7	10.7	53.6	76.9
Total	9,468	12.9	30.0	57.1	30.0

*Note.* Data are from the NRC Doctorate Records File (1994) and the NIH Trainee and Fellow File (1994). Included in the total are a small number of postdoctoral awards made to biomedical Ph.D.s by the NIDCD ( $n = 18$ ), the NCHGR ( $n = 3$ ), the NCHGR ( $n = 3$ ), and the AHRQ ( $n = 4$ ). Institute totals of postdoctoral training awards is restricted to those traineeships and fellowships awarded to 1981-90 biomedical science Ph.D.s, were received within four years of their doctorate, and were at least nine months in duration.

Appendix Table D.9  
**Biomedical Ph.D.s Who Reported Beginning Postdoctoral Study Within Four Years of Degree Receipt**

Group		Fiscal Year of Doctorate					Total
		1981-82	1983-84	1985-86	1987-88	1989-90	
<b>Postdoctoral support, all sources</b>							
NRSA trainees and fellows	%	78.2	73.7	73.6	84.0	79.9	77.9
Ph.D.s from NIH training institutions	%	59.0	60.1	58.9	60.9	60.4	59.9
Ph.D.s from non-NIH training institutions	%	51.3	45.9	47.0	48.5	45.6	47.6
All groups	%	61.7	59.3	59.7	63.7	60.2	61.0
<b>NIH postdoctoral support</b>							
NRSA trainees and fellows	%	42.5	44.4	33.0	38.6	38.5	39.3
Ph.D.s from NIH training institutions	%	28.7	29.3	26.4	22.9	24.2	26.2
Ph.D.s from non-NIH training institutions	%	23.6	19.0	16.4	19.6	16.7	19.0
All groups	%	30.8	30.4	25.3	26.6	25.3	27.6
<b>Other postdoctoral support</b>							
NRSA trainees and fellows	%	35.8	29.3	40.6	45.5	41.3	38.6
Ph.D.s from NIH training institutions	%	30.2	30.8	32.6	38.0	36.3	33.6
Ph.D.s from non-NIH training institutions	%	27.8	26.9	30.6	29.0	28.9	28.6
All groups	%	30.9	28.9	34.5	37.1	34.9	33.4
<b>Estimated sample ns</b>							
NRSA trainees and fellows	N	179	195	208	205	190	977
Ph.D.s from NIH training institutions	N	233	202	235	228	233	1,131
Ph.D.s from non-NIH training institutions	N	223	219	212	231	259	1,144
All groups	N	635	616	355	664	682	3,253

Appendix Table D.9 (continued)  
**Biomedical Ph.D.s Who Reported Beginning Postdoctoral Study Within Four Years of Degree Receipt**

Group	Fiscal Year of Doctorate					Total
	1981-82	1983-84	1985-86	1987-88	1989-90	
<b>Effect sizes: NRSA vs. NIH training institution</b>						
Any postdoctoral support	<i>0.42<sup>b</sup></i>	<i>0.29<sup>b</sup></i>	<i>0.31<sup>b</sup></i>	<b>0.53<sup>b</sup></b>	<i>0.43<sup>b</sup></i>	<i>0.39<sup>b</sup></i>
NIH postdoctoral support	<i>0.29<sup>b</sup></i>	<i>0.31<sup>b</sup></i>	0.15	<i>0.34<sup>b</sup></i>	<i>0.31<sup>b</sup></i>	<i>0.28<sup>b</sup></i>
Other postdoctoral support	0.12	-0.03	0.17	0.15	0.10	0.10
<b>Effect sizes: NRSA vs. non-NIH training institutions</b>						
Any postdoctoral support	<b>0.57<sup>b</sup></b>	<b>0.58<sup>b</sup></b>	<b>0.55<sup>b</sup></b>	<b>0.78<sup>b</sup></b>	<b>0.73<sup>b</sup></b>	<b>0.64<sup>b</sup></b>
NIH postdoctoral support	<i>0.41<sup>b</sup></i>	<b>0.56<sup>b</sup></b>	<i>0.39<sup>b</sup></i>	<i>0.42<sup>b</sup></i>	<b>0.50<sup>b</sup></b>	<i>0.45<sup>b</sup></i>
Other postdoctoral support	0.17	0.05	<i>0.21</i>	<i>0.34<sup>b</sup></i>	<i>0.26<sup>b</sup></i>	<i>0.21<sup>b</sup></i>
<b>Effect sizes: NIH vs. non-NIH training institutions</b>						
Any postdoctoral support	0.15	<i>0.28<sup>b</sup></i>	<i>0.24<sup>a</sup></i>	<i>0.25<sup>a</sup></i>	<i>0.30<sup>b</sup></i>	<i>0.25<sup>b</sup></i>
NIH postdoctoral support	0.12	<i>0.24<sup>a</sup></i>	<i>0.24<sup>a</sup></i>	0.08	0.19	<i>0.17<sup>b</sup></i>
Other postdoctoral support	0.05	0.08	0.04	0.19	0.16	0.11

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), and the NSF 1995 Survey of Doctorate Recipients. The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. To be considered a postdoctoral appointment, study had to begin no earlier than 12 months before the individual's last doctoral degree but no later than 4 years after degree receipt and be at least nine months in duration. Individuals with NRSA postdoctoral support (F32, F35, or T32) also could have received support from other sources. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>p < 0.05

<sup>b</sup>p < 0.01

Appendix Table D.10  
**Estimated Standardized Coefficients for Regressions on  
Pursuit of Postdoctoral Study: 1981-90 Biomedical Ph.D.s**

Independent Variable	NRSA vs. NIH Training Institution (n = 1,993)	NRSA vs. Non-NIH Training Institution (n = 1,952)
	Coefficient	Coefficient
<i>Demographic variables:</i>		
Female	0.00	-0.02
Underrepresented minority	-0.00	0.00
Age at time of entry into a graduate program	-0.05	-0.12 <sup>b</sup>
<i>Year of Ph.D.</i>	0.09 <sup>a</sup>	0.11 <sup>b</sup>
<i>Reputational ranking of educational institutions:</i>		
Earned B.A. from a highly selective institutions	0.04	0.08
Reputational ranking of Ph.D. institution	0.07	0.15 <sup>b</sup>
<i>Traditional involvement of field in postdoctoral training:</i>		
High	0.59 <sup>c</sup>	0.71 <sup>c</sup>
Moderate	0.24 <sup>c</sup>	0.24 <sup>c</sup>
<i>Coterminous M.D./Ph.D.</i>	-0.18 <sup>c</sup>	-0.21 <sup>c</sup>
<i>Primary source of graduate support</i>		
Research assistantship	0.11 <sup>b</sup>	0.09 <sup>a</sup>
Teaching assistantship	0.04	0.05
Earnings from employment	-0.14 <sup>c</sup>	-0.17 <sup>c</sup>
<i>Interruptions in graduate study</i> (years not enrolled from first entry into a graduate program until Ph.D. receipt)	-0.19 <sup>c</sup>	-0.16 <sup>c</sup>
<i>Time-to-degree</i> (years enrolled in graduate school)	-0.11 <sup>b</sup>	-0.19 <sup>c</sup>
<i>Health of labor market</i> (Percent of Ph.D.s in same field and cohort with definite commitments at graduation)	0.07	0.01
<i>NRSA predoctoral trainee or fellow</i>	0.15 <sup>c</sup>	0.14 <sup>b</sup>
Pseudo R <sup>2</sup>	0.28	0.34

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995), and the NSF 1995 Survey of Doctorate Recipients. Disciplines with high postdoctoral participation were those in which at least 70 percent of all 1981-92 Ph.D.s had definite plans for pursuing postdoctoral study at the time of graduation (i.e., anatomy, biochemistry, biophysics, cell/developmental biology, endocrinology, genetics, immunology, microbiology/bacteriology, molecular biology, neuroscience, pharmacology, and physiology). Fields labeled as having histories of moderate postdoctoral participation levels were those in which 30 to 69 percent of Ph.D.s indicated such plans (bioengineering, general biological sciences, general health sciences, medicinal chemistry, nutritional sciences, parasitology, pathology, toxicology, zoology, and other biological sciences). The *ns* reported are sample estimates.

<sup>a</sup>p < 0.05      <sup>b</sup>p < 0.01      <sup>c</sup>p < 0.001

Appendix Table D.11  
**Employment Setting of Biomedical Ph.D.s 7-8 Years Post-Ph.D.**

Group and Setting	Fiscal Year of Doctorate					
	1981-82	1983-84	1985-86	1987-88	Total	
<b>Academic settings, tenure-line positions</b>						
NRSA predoctoral trainees and fellows	%	38.3	38.7	39.4	41.2	39.3
Ph.D.s from NIH training institutions	%	23.5	29.6	36.2	30.7	29.1
Ph.D.s from non-NIH training institutions	%	28.4	37.2	28.4	36.7	32.0
Total, all groups	%	29.3	35.2	34.7	36.0	33.2
<b>Academic settings, non-tenure-line positions</b>						
NRSA predoctoral trainees and fellows	%	23.5	16.8	20.2	16.9	19.9
Ph.D.s from NIH training institutions	%	23.3	17.0	17.1	16.4	19.2
Ph.D.s from non-NIH training institutions	%	22.6	16.6	21.5	14.7	19.4
Total, all groups	%	23.1	16.8	19.5	16.0	19.5
<b>Business and industry</b>						
NRSA predoctoral trainees and fellows	%	24.0	28.3	23.9	22.6	24.5
Ph.D.s from NIH training institutions	%	31.5	26.3	27.6	28.5	29.0
Ph.D.s from non-NIH training institutions	%	24.1	30.1	24.9	22.2	25.0
Total, all groups	%	26.9	28.3	25.6	24.5	26.3
<b>Other employment settings</b>						
NRSA predoctoral trainees and fellows	%	14.2	16.1	16.5	19.3	16.3
Ph.D.s from NIH training institutions	%	21.7	27.1	19.1	24.3	22.6
Ph.D.s from non-NIH training institutions	%	25.0	16.2	25.2	26.4	23.6
Total, all groups	%	20.8	19.8	20.2	23.5	21.1

Appendix Table D.11 (continued)  
**Employment Setting of Biomedical Ph.D. s 7-8 Years Post-Ph.D.**

Group		Fiscal Year of Doctorate				Total
		1981-82	1983-84	1985-86	1987-88	
<b>Total estimated n</b>						
NRSA predoctoral trainees and fellows	N	334	213	263	232	1,042
Ph.D.s from NIH training institutions	N	459	221	290	266	1,235
Ph.D.s from non-NIH training institutions	N	423	232	262	273	1,190
Total, all groups	N	1,216	666	815	770	3,468
<b>Effect sizes: NRSA vs. NIH training institution</b>						
Academic settings, tenure-line		0.32 <sup>c</sup>	0.19 <sup>a</sup>	0.07	0.22 <sup>a</sup>	0.21
Academic settings, non-tenure line		0.02	0.01	-0.11	0.05	0.00
Business and industry		-0.17 <sup>a</sup>	0.04	-0.08	-0.14	-0.10
Other		-0.20 <sup>b</sup>	-0.27 <sup>b</sup>	-0.07	-0.12	-0.16
<b>Effect sizes: NRSA vs. non-NIH training institutions</b>						
Academic settings, tenure-line		0.21 <sup>c</sup>	0.03	0.23 <sup>b</sup>	0.09	0.15
Academic settings, non-tenure line		0.00	0.01	-0.06	0.01	0.00
Business and industry		0.00	-0.04	-0.02	0.01	-0.01
Other		-0.27 <sup>c</sup>	0.01	-0.22 <sup>a</sup>	-0.17	-0.18

Appendix Table D.11 (continued)  
**Employment Setting of Biomedical Ph.D. s 7-8 Years Post-Ph.D.**

Group	Fiscal Year of Doctorate				Total
	1981-82	1983-84	1985-86	1987-88	
<b>Effect sizes: NIH vs. non-NIH training institutions</b>					
Academic settings, tenure-line	-0.11	-0.16	0.17	-0.13	-0.06
Academic settings, non-tenure line	-0.01	-0.01	0.05	-0.03	-0.01
Business and industry	0.17 <sup>a</sup>	-0.08	0.06	0.14	0.09
Other	-0.08	0.27 <sup>b</sup>	-0.15	-0.05	-0.02

*Note.* Data are from the NRC Doctorate Records File (1994), the NSF Survey of Doctorate Recipients (1989-95), and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Employment settings are reported for full- and part-time employed individuals, based on their responses to the respective survey that was completed 7-8 years after their Ph.D. All ns are sample estimates. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger). Total percentages for all cohorts are based on the average percentage obtained across the four surveys, and no statistical tests were performed.

<sup>a</sup>p < 0.05

<sup>b</sup>p < 0.01

<sup>a</sup>p < 0.001

Appendix Table D.12  
**Biomedical Ph.D. s with Faculty Positions at Institutions Ranked in the Top Quartile of Those with Doctoral Programs in the Biomedical Sciences 7-8 Years Post-Ph.D.**

Group		Fiscal Year of Doctorate				Total
		1981-82	1983-84	1985-86	1987-88	
<b>NRSA predoctoral trainees and fellows</b>						
Total	N	306	207	240	214	967
Faculty at institutions in the top quartile	%	39.9	38.2	35.4	33.6	37.0
<b>Ph.D. from NIH training institutions</b>						
Total	N	440	210	271	252	1,173
Faculty at institutions in the top quartile	%	22.5	24.3	24.4	23.4	23.4
<b>Ph.D.s from non-NIH training institutions</b>						
Total	N	411	227	250	263	1,151
Faculty at institutions in the top quartile	%	19.0	13.7	16.0	12.9	15.9
<b>Total, all group</b>						
Total	N	1,157	644	761	729	3,291
Faculty at institutions in the top quartile	%	25.8	25.0	25.1	22.6	24.8
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions		<i>0.38<sup>c</sup></i>	<i>0.30<sup>b</sup></i>	<i>0.24<sup>b</sup></i>	<i>0.23<sup>a</sup></i>	<i>0.30</i>
NRSA vs. non-NIH training institutions		<i>0.47<sup>c</sup></i>	<b>0.57<sup>c</sup></b>	<i>0.45<sup>c</sup></i>	<b>0.50<sup>c</sup></b>	<i>0.49</i>
NIH vs. non-NIH training institutions		0.09	<i>0.27<sup>b</sup></i>	<i>0.21<sup>a</sup></i>	<i>0.27<sup>b</sup></i>	0.19

*Note.* Data are from the NRC Doctorate Records File (1994), the NSF Survey of Doctorate Recipients (1989-95), and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Data are for full-time employed individuals who responded to the survey wave that occurred 7-8 years after their Ph.D. Institutional rankings were based on the average of the normalized scores for the scholarly quality of faculty in the biomedical sciences programs surveyed by Goldberger, Maher, and Flattau (1995). All *ns* are sample estimates. The use of italics indicates that the effect size is a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>*p* < 0.05

<sup>b</sup>*p* < 0.01

<sup>c</sup>*p* < 0.001

## Biomedical Ph.D. s Who Were in Research Career Positions 7-8 Years Post-Ph.D.

Group		Fiscal Year of Doctorate				
		1981-82	1983-84	1985-86	1987-88	Total
<b>NRSA predoctoral trainees and fellows</b>						
Total	N	334	213	263	232	1,042
In research positions	%	87.2	90.5	85.0	86.8	87.2
<b>Ph.D. from NIH training institutions</b>						
Total	N	459	221	290	266	1,235
In research positions	%	76.1	70.8	82.5	78.8	77.2
<b>Ph.D.s from non-NIH training institutions</b>						
Total	N	423	232	262	273	1,190
In research positions	%	74.8	64.1	74.4	73.5	72.3
<b>Total, all group</b>						
Total	N	1,216	666	815	770	3,468
In research positions	%	78.7	74.8	80.7	79.3	78.5
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions		<i>0.29<sup>c</sup></i>	<b>0.51<sup>c</sup></b>	0.07	<i>0.21<sup>a</sup></i>	<i>0.26</i>
NRSA vs. non-NIH training institutions		<i>0.32<sup>c</sup></i>	<b>0.66<sup>c</sup></b>	<i>0.26<sup>b</sup></i>	<i>0.34<sup>c</sup></i>	<i>0.38</i>
NIH vs. non-NIH training institutions		0.03	0.14	<i>0.20<sup>a</sup></i>	0.12	0.11

*Note.* Data are from the NRC Doctorate Records File (1994), the NSF Survey of Doctorate Recipients (1989-95), and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Included are individuals who reported either full- or part-time employment on the SDR that occurred 7-8 years after their Ph.D. All *ns* are sample estimates. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between 0.20 and 0.49); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between 0.50 and 0.79), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\geq 0.80$  or larger).

<sup>a</sup>p < 0.05<sup>b</sup>p < 0.01<sup>c</sup>p < 0.001

Appendix Table D.14

## Biomedical Ph.D. s Who Were in Research Career or Training Positions in 1995

Group		Years After Ph.D. Receipt						Total
		1-2	3-4	5-6	7-8	9-10	11-12	
<b>NRSA predoctoral trainees and fellows</b>								
Total	N	256	234	249	264	243	224	979
In research positions	%	85.7	87.2	87.7	79.1	80.6	84.4	82.9
<b>Ph.D. from NIH training institutions</b>								
Total	N	283	277	279	280	242	283	1,085
In research positions	%	77.3	79.0	79.8	81.6	70.4	69.8	75.6
<b>Ph.D.s from non-NIH training institutions</b>								
Total	N	337	315	278	259	269	273	1,079
In research positions	%	75.6	67.9	74.0	73.8	68.0	67.6	70.8
<b>Total, all group</b>								
Total	N	876	826	805	803	754	781	3,144
In research positions	%	79.1	77.1	80.2	78.3	72.8	73.3	76.2
<b>Effect sizes:</b>								
NRSA vs. NIH training institutions		<i>0.22<sup>a</sup></i>	<i>0.22<sup>a</sup></i>	<i>0.21<sup>a</sup></i>	-0.06	<i>0.24<sup>b</sup></i>	<i>0.35<sup>c</sup></i>	<i>0.18</i>
NRSA vs. non-NIH training institutions		<i>0.26<sup>b</sup></i>	<i>0.47<sup>c</sup></i>	<i>0.35</i>	0.13	<i>0.29<sup>c</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.29</i>
NIH vs. non-NIH training institutions		0.04	<i>0.25<sup>b</sup></i>	0.14	0.19 <sup>a</sup>	0.05	0.05	0.11

*Note.* Data are from the NRC Doctorate Records File (1994), the NSF Survey of Doctorate Recipients (1989-95), and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. Data are for full-time employed respondents to the SDR survey that occurred 7-8 years after their Ph.D. Research career positions include: (a) holding a faculty position in an institution with one or more biomedical doctoral programs ranked in the 1995 Research Doctorate Study; (b) working in a nonacademic job for which research is the primary responsibility; or (c) being in a postdoctoral training appointment. All *ns* are sample estimates. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>*p* < 0.05

<sup>b</sup>*p* < 0.01

<sup>c</sup>*p* < 0.001

Appendix Table D.15  
**Applications for an NIH or NSF Research Grant by FY 1994 for Biomedical Ph.D.s**

Group		Fiscal Year of Doctorate						Total
		1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>NRSA</b>								
Total	N	1,628	1,834	1,833	1,830	1,835	2,040	11,000
Applied for an NIH or NSF grant	N	898	944	826	676	363	194	3,901
	%	55.2	51.5	45.1	36.9	19.8	9.5	35.5
<b>NIH training institutions</b>								
Total	N	2,600	2,349	2,460	2,576	2,746	2,713	15,444
Applied for an NIH or NSF grant	N	1,113	914	838	629	437	226	4,157
	%	42.8	38.9	34.1	24.4	15.9	8.3	26.9
<b>Non-NIH training institutions</b>								
Total	N	2,413	2,412	2,130	2,274	2,516	2,928	14,673
Applied for an NIH or NSF grant	N	859	796	621	454	345	197	3,272
	%	35.6	33.0	29.2	20.0	13.7	6.7	22.3
<b>Total, all groups</b>								
Total	N	6,641	6,595	6,423	6,680	7,097	7,681	41,117
Applied for an NIH or NSF grant	N	2,870	2,654	2,285	1,759	1,145	617	11,330
	%	43.2	40.2	35.6	26.3	16.1	8.0	27.6

Appendix Table D.15 (continued)  
**Applications for an NIH or NSF Research Grant by FY 1994 for Biomedical Ph.D.s**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
NRSA vs. NIH training institutions	<i>0.25<sup>c</sup></i>	<i>0.25<sup>c</sup></i>	<i>0.23<sup>c</sup></i>	<i>0.27<sup>c</sup></i>	<i>0.10<sup>c</sup></i>	0.04	0.19
NRSA vs. non-NIH training institutions	<i>0.40<sup>c</sup></i>	<i>0.38<sup>c</sup></i>	<i>0.33<sup>c</sup></i>	<i>0.38<sup>c</sup></i>	<i>0.16<sup>c</sup></i>	<i>0.10<sup>c</sup></i>	<i>0.29</i>
NIH vs. non-NIH training institutions	<i>0.15<sup>c</sup></i>	<i>0.12<sup>c</sup></i>	<i>0.11<sup>c</sup></i>	<i>0.11<sup>c</sup></i>	<i>0.06<sup>a</sup></i>	<i>0.06<sup>a</sup></i>	0.11

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grant Applicant File (1995), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. Applying for an NIH or NSF research grant is defined as having submitted at least one research grant application or proposal to either the NIH or the NSF no earlier than 12 months prior to receipt of their last known doctoral degree (Ph.D. or M.D.). NIH research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCRR for applications prior to FY 1990, and U01 for FY 1980-81. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>p < 0.05

<sup>b</sup>p < 0.01

<sup>c</sup>p < 0.001

Appendix Table D.16  
**Biomedical Ph.D.s Who Applied for and Received an NIH or NSF Grant by FY 1994**

Group	Fiscal Year of Doctorate						Total	
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92		
<b>NRSA</b>								
Total number of applicants	N	898	944	826	676	363	194	3,901
Awarded an NIH or NSF grant	N	671	638	541	384	166	74	2,474
	%	74.7	67.6	65.5	56.8	45.7	38.1	63.4
<b>NIH training institutions</b>								
Total	N	1,113	914	838	629	437	226	4,157
Awarded an NIH or NSF grant	N	674	512	430	305	183	96	2,200
	%	60.6	56.0	51.3	48.5	41.9	42.5	52.9
<b>Non-NIH training institutions</b>								
Total	N	859	796	621	454	345	197	3,272
Awarded an NIH or NSF grant	N	443	391	276	179	111	88	1,488
	%	51.6	49.1	44.4	39.4	32.2	44.7	45.5
<b>Total, all groups</b>								
Total	N	2,870	2,654	2,285	1,759	1,145	617	11,330
Awarded an NIH or NSF grant	N	1,788	1,541	1,247	868	460	258	6,162
	%	62.3	58.1	54.6	49.3	40.2	41.08	54.4

Appendix Table D.16 (continued)  
**Biomedical Ph.D.s Who Applied for and Received an NIH or NSF Grant by FY 1994**

Group	Fiscal Year of Doctorate						Total
	1981-82	1983-84	1985-86	1987-88	1989-90	1991-92	
<b>Effect sizes:</b>							
NRSA vs. NIH training institutions	<i>0.30<sup>c</sup></i>	<i>0.24<sup>c</sup></i>	<i>0.29<sup>c</sup></i>	0.17 <sup>b</sup>	0.08	-0.09	<i>0.21<sup>c</sup></i>
NRSA vs. non-NIH training institutions	<i>0.48<sup>c</sup></i>	<i>0.38<sup>c</sup></i>	<i>0.43<sup>c</sup></i>	<i>0.35<sup>c</sup></i>	<i>0.28<sup>c</sup></i>	-0.13	<i>0.36<sup>c</sup></i>
NIH vs. non-NIH training institutions	0.18 <sup>c</sup>	0.14 <sup>b</sup>	0.14 <sup>b</sup>	0.18 <sup>b</sup>	<i>0.20<sup>b</sup></i>	-0.04	0.15 <sup>c</sup>

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grant Applicant File (1995), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. Applying for an NIH or NSF research grant is defined as having submitted at least one research grant application or proposal to either the NIH or the NSF no earlier than 12 months prior to receipt of their last known doctoral degree (Ph.D. or M.D.). NIH research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCRR for applications prior to FY 1990, and U01 for FY 1980-81. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$     <sup>b</sup>  $p < 0.01$     <sup>c</sup>  $p < 0.001$

Appendix Table D.17a  
**Biomedical Ph.Ds Who Applied for and Received an NIH Research Grant Within 12 Months of Review Date**

Group		Fiscal Year of First Application										Total
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
<b>NRSA</b>												
Total applicants	N	178	264	262	298	305	356	341	338	331	353	2,721
Funded within 12 months	N	83	129	121	142	137	132	133	141	134	105	1,120
	%	46.6	48.9	46.2	47.7	44.9	37.1	39.0	41.7	40.5	29.7	41.2
<b>NIH training institutions</b>												
Total applicants	N	229	234	310	306	266	318	300	313	225	222	2,457
Funded within 12 months	N	104	83	104	112	97	76	90	112	63	52	796
	%	45.5	35.5	33.5	36.6	36.5	23.9	30.0	35.8	28.0	23.4	32.4
<b>Non-NIH training institutions</b>												
Total applicants	N	153	171	195	223	224	200	190	201	150	145	1,628
Funded within 12 months	N	54	49	50	65	58	44	43	57	36	23	421
	%	35.3	28.7	25.6	29.1	25.9	22.0	22.6	28.4	24.0	15.9	25.9
<b>Total, all Ph.D. recipients</b>												
Total applicants	N	560	669	767	827	795	874	831	852	706	720	6,806
Funded within 12 months	N	241	261	275	319	292	252	266	310	233	180	2,337
	%	43.0	39.0	35.9	38.6	36.7	28.8	32.0	36.4	33.0	25.0	34.3

Appendix Table D.17a (continued)  
**Biomedical Ph.Ds Who Applied for and Received an NIH Research Grant Within 12 Months of Review Date**

Group	Fiscal Year of First Application										Total
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
<b>Effect sizes</b>											
NRSA vs. NIH training institutions	0.02	<i>0.27<sup>b</sup></i>	<i>0.26<sup>b</sup></i>	<i>0.22<sup>b</sup></i>	0.17 <sup>a</sup>	<i>0.29<sup>c</sup></i>	0.19 <sup>a</sup>	0.12	<i>0.26<sup>b</sup></i>	0.14	0.18
NRSA vs. non-NIH training institutions	<i>0.23<sup>a</sup></i>	<i>0.42<sup>c</sup></i>	<i>0.43<sup>c</sup></i>	<i>0.38<sup>c</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.33<sup>c</sup></i>	<i>0.36<sup>c</sup></i>	<i>0.28<sup>b</sup></i>	<i>0.36<sup>c</sup></i>	<i>0.33<sup>c</sup></i>	<i>0.33<sup>c</sup></i>
NIH vs. non-NIH training institutions	<i>0.21<sup>a</sup></i>	0.15	0.17	0.16	<i>0.23<sup>a</sup></i>	0.05	0.17	0.16	0.09	0.19	0.14

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grant Applicant File (1995), and the NIH Trainee and Fellow File (1994). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. Applications had to be submitted no earlier than 12 months prior to receipt of their last known doctoral degree (Ph.D. or M.D.). “Within 12 months” is for the difference in the time from the Initial Review Group Date to the start of the awards identified by the budget. Research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY 1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCR for applications prior to FY 1990, and U01 for FY 1980-81. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$       <sup>b</sup>  $p < 0.01$       <sup>c</sup>  $p < 0.001$

Appendix Table D.17b  
**Biomedical Ph.D. s Who Applied for and Received an NSF Research Grant Within 12 Months of Review Date**

Group		Fiscal Year of First Application										Total
		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
<b>NRSA</b>												
Total applicants	N	124	146	170	180	169	215	268	215	156	182	1,656
Funded within 12 months	N	35	499	471	352	467	522	693	591	384	485	432
	%	28.2	33.6	27.6	19.4	27.2	24.2	25.7	27.4	24.4	26.4	26.1
<b>NIH training institutions</b>												
Total applicants	N	148	168	191	198	195	245	206	223	164	134	1,677
Funded within 12 months	N	33	36	61	37	60	52	43	53	33	34	382
	%	22.3	21.4	31.9	18.7	30.8	21.2	20.9	23.8	20.1	25.4	22.8
<b>Non-NIH training institutions</b>												
Total applicants	N	133	117	161	152	177	199	186	179	133	139	1,399
Funded within 12 months	N	23	28	34	36	40	42	42	34	26	36	301
	%	17.3	23.9	21.1	23.7	22.6	21.1	22.6	19.0	19.5	25.9	21.5
<b>Total, all Ph.D. recipients</b>												
Total applicants	N	405	431	522	530	541	659	660	617	453	455	4,732
Funded within 12 months	N	91	113	142	108	146	146	154	146	97	118	1,115
	%	22.5	26.2	27.2	20.4	27.0	22.2	23.3	23.7	21.4	25.9	23.6

Appendix Table D.17b  
**Biomedical Ph.D. s Who Applied for and Received an NSF Research Grant Within 12 Months of Review Date**

Group	Fiscal Year of First Application										Total
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
<b>Effect sizes</b>											
NRSA vs. NIH training institutions	0.14	<i>0.27<sup>a</sup></i>	-0.09	0.02	0.08	0.07	0.12	0.08	0.10	0.02	0.08
NRSA vs. non-NIH training institutions	<i>0.26<sup>a</sup></i>	<i>0.21<sup>a</sup></i>	0.15	-0.10	0.11	0.07	0.07	<i>0.20</i>	0.12	0.01	0.11
NIH vs. non-NIH training institutions	0.13	-0.06	<i>0.24<sup>a</sup></i>	-0.12	0.19	0.00	-0.04	0.12	0.01	-0.01	0.03

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. The year of first application had to occur no earlier than 12 months prior to receipt of their last known doctoral degree (Ph.D. or M.D.). The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| to |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| to |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$

Appendix Table D.18a  
**Applications for an NIH or NSF Research Grant by FY 1994 for  
 Biomedical Ph.D.s by Field Cluster**

Group		Fiscal Year of Doctorate				Total
		1981-82	1983-84	1985-86	1987-88	
<b>Fields with high proportions of postdocs</b>						
<b>NRSA trainees and fellows</b>	N	1,247	1,505	1,365	1,332	5,449
Applied for an NIH or NSF grant	%	56.2	50.8	47.5	37.8	48.1
<b>Ph.D.s from NIH training institutions</b>	N	1,609	1,442	1,415	1,413	5,879
Applied for an NIH or NSF grant	%	46.2	41.5	37.7	28.4	38.7
<b>Ph.D.s from non-NIH training institutions</b>	N	1,270	1,541	1,171	1,411	4,482
Applied for an NIH or NSF grant	%	42.4	41.1	36.4	24.5	36.5
<b>Total, all groups</b>	N	4,126	4,101	3,797	3,786	15,810
Applied for an NIH or NSF grant	%	44.1	44.8	36.4	24.5	36.5
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions		0.20 <sup>c</sup>	0.19 <sup>c</sup>	0.20 <sup>c</sup>	0.20 <sup>c</sup>	0.19 <sup>c</sup>
NRSA vs. nn-NIH training institutions		0.28 <sup>c</sup>	0.20 <sup>c</sup>	0.23 <sup>c</sup>	0.29 <sup>c</sup>	0.23 <sup>c</sup>
NIH vs. non-NIH training institutions		0.08 <sup>a</sup>	0.01	0.03	0.09	0.05 <sup>a</sup>
<b>Fields with moderate proportions of postdocs</b>						
<b>NRSA trainees and fellows</b>	N	245	290	296	311	1,142
Applied for an NIH or NSF grant	%	57.1	45.5	39.5	35.0	43.6
<b>Ph.D.s from NIH training institutions</b>	N	596	510	555	620	2,281
Applied for an NIH or NSF grant	%	46.0	41.4	35.9	26.9	37.3
<b>Ph.D.s from non-NIH training institutions</b>	N	641	732	663	706	2,742
Applied for an NIH or NSF grant	%	34.6	29.8	25.9	19.7	27.4
<b>Total, all groups</b>	N	1,482	1,532	1,514	1,637	6,165
Applied for an NIH or NSF grant	%	42.9	36.6	32.2	25.4	34.1

Appendix Table D.18a (continued)  
**Applications for an NIH or NSF Research Grant by FY 1994 for  
 Biomedical Ph.D.s by Field Cluster**

Group	Fiscal Year of Doctorate					
	1981-82	1983-84	1985-86	1987-88	Total	
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions	<i>0.22<sup>b</sup></i>	0.08	0.08	<i>0.18<sup>a</sup></i>	0.13 <sup>c</sup>	
NRSA vs. non-NIH training institutions	<i>0.46<sup>c</sup></i>	<i>0.33<sup>c</sup></i>	<i>0.29<sup>c</sup></i>	<i>0.35<sup>c</sup></i>	<i>0.34<sup>c</sup></i>	
NIH vs. non-NIH training institutions	<i>0.23<sup>c</sup></i>	<i>0.24<sup>c</sup></i>	<i>0.22<sup>c</sup></i>	0.17 <sup>b</sup>	0.21 <sup>c</sup>	
<b>Fields with low proportions of postdocs</b>						
<b>NRSA trainees and fellows</b>	N	136	139	172	187	634
Applied for an NIH or NSF grant	%	41.9	33.8	34.9	33.7	35.8
<b>Ph.D.s from NIH training institutions</b>	N	395	397	490	543	1,825
Applied for an NIH or NSF grant	%	24.1	26.2	21.6	11.2	20.1
<b>Ph.D.s from non-NIH training institutions</b>	N	502	526	450	527	2,005
Applied for an NIH or NSF grant	%	19.5	19.8	17.6	11.4	17.0
<b>Total, all groups</b>	N	1,033	1,062	1,112	1,257	4,464
Applied for an NIH or NSF grant	%	24.2	24.0	22.0	14.6	20.9
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions		<i>0.38<sup>c</sup></i>	0.17	<i>0.30<sup>c</sup></i>	<i>0.55<sup>c</sup></i>	<i>0.35<sup>c</sup></i>
NRSA vs. non-NIH training institutions		<i>0.49<sup>c</sup></i>	<i>0.32<sup>c</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.55<sup>c</sup></i>	<i>0.43<sup>c</sup></i>
NIH vs. non-NIH training institutions		0.10	0.15 <sup>a</sup>	0.10	0.00	0.08 <sup>a</sup>

**Note.** Data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grant Applicant File (1995), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. Applying for an NIH or NSF research grant is defined as having submitted at least one research grant application or proposal to either the NIH or the NSF no earlier than 12 months prior to receipt of their last known doctoral degree. NIH research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY 1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCRN for applications prior to FY 1990, and U01 for FY 1980-81. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$

<sup>b</sup>  $p < 0.01$

<sup>c</sup>  $p < 0.001$

Appendix Table D.18b  
**Biomedical Ph.Ds Who Applied for and Were Awarded an NIH or NSF  
 Research Grant by Field Cluster**

Group	Fiscal Year of Doctorate					Total
	1981-82	1983-84	1985-86	1987-88		
<b>Fields with high proportions of postdocs</b>						
<b>NRSA trainees and fellow applicants</b>	N	537	527	436	296	1,796
Awarded an NIH or NSF grant	%	76.7	68.9	67.2	58.7	68.6
<b>Ph.D.s from NIH training institutions</b>	N	744	599	533	401	2,277
Awarded an NIH or NSF grant	%	61.7	55.9	52.9	50.6	56.2
<b>Ph.D.s from non-NIH training institutions</b>	N	539	474	370	255	1,638
Awarded an NIH or NSF grant	%	55.8	52.7	48.4	39.6	51.3
<b>Total, all groups</b>	N	1,984	1,838	1,552	1,160	6,534
Awarded an NIH or NSF grant	%	65.4	60.5	57.8	51.7	59.9
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions		0.33 <sup>c</sup>	0.27 <sup>c</sup>	0.29 <sup>c</sup>	0.16 <sup>a</sup>	0.26 <sup>c</sup>
NRSA vs. non-NIH training institutions		0.41 <sup>c</sup>	0.33 <sup>c</sup>	0.38 <sup>c</sup>	0.38 <sup>c</sup>	0.35 <sup>c</sup>
NIH vs. non-NIH training institutions		0.09 <sup>a</sup>	0.06	0.09	0.22 <sup>c</sup>	0.10 <sup>c</sup>
<b>Fields with moderate proportions of postdocs</b>						
<b>NRSA trainees and fellows</b>	N	140	132	117	109	498
Awarded an NIH or NSF grant	%	72.9	67.4	65.0	60.6	66.9
<b>Ph.D.s from NIH training institutions</b>	N	274	211	199	167	851
Awarded an NIH or NSF grant	%	63.1	59.2	46.7	47.3	55.2
<b>Ph.D.s from non-NIH training institutions</b>	N	222	218	172	139	751
Awarded an NIH or NSF grant	%	45.0	48.2	45.3	38.8	44.9
<b>Total, all groups</b>	N	636	561	488	415	2,100
Awarded an NIH or NSF grant	%	59.0	56.9	50.6	48.0	54.3

Appendix Table D.18b (continued)  
**Biomedical Ph.D.s Who Awarded and Were Awarded an NIH or NSF  
 Research Grant by Field Cluster**

Group	Fiscal Year of Doctorate					
	1981-82	1983-84	1985-86	1987-88	Total	
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions	<i>0.21<sup>a</sup></i>	0.17	<i>0.37<sup>b</sup></i>	<i>0.27<sup>a</sup></i>	0.24 <sup>c</sup>	
NRSA vs. non-NIH training institutions	<i>0.57<sup>c</sup></i>	<i>0.39<sup>c</sup></i>	<i>0.40<sup>c</sup></i>	<i>0.44<sup>c</sup></i>	<i>0.45<sup>c</sup></i>	
NIH vs. non-NIH training institutions	<i>0.37<sup>a</sup></i>	<i>0.22<sup>a</sup></i>	0.02	0.17	<i>0.21<sup>c</sup></i>	
<b>Fields with low proportions of postdocs</b>						
<b>NRSA trainees and fellows</b>	N	57	47	60	63	227
Awarded an NIH or NSF grant	%	56.1	46.8	48.3	34.9	46.3
<b>Ph.D.s from NIH training institutions</b>	N	95	104	106	61	366
Awarded an NIH or NSF grant	%	44.2	50.0	51.9	37.7	47.0
<b>Ph.D.s from non-NIH training institutions</b>	N	98	104	79	60	341
Awarded an NIH or NSF grant	%	42.9	34.6	24.1	40.0	35.5
<b>Total, all groups</b>	N	250	255	245	184	934
Awarded an NIH or NSF grant	%	40.8	34.9	31.0	35.9	35.7
<b>Effect sizes:</b>						
NRSA vs. NIH training institutions	<i>0.24</i>	-0.06	-0.07	-0.05	-0.01	
NRSA vs. non-NIH training institutions	<i>0.27</i>	<i>0.24</i>	<i>0.51<sup>b</sup></i>	-0.10	<i>0.22<sup>a</sup></i>	
NIH vs. non-NIH training institutions	0.03	<i>0.31<sup>a</sup></i>	<i>0.58<sup>b</sup></i>	-0.04	<i>0.23<sup>b</sup></i>	

**Note.** Data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grant Applicant File (1995), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 support. Applying for an NIH or NSF research grant is defined as having submitted at least one research grant application or proposal to either the NIH or the NSF no earlier than 12 months prior to receipt of their last known doctoral degree. NIH research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY 1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCRR for applications prior to FY 1990, and U01 for FY 1980-81. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$     <sup>b</sup>  $p < 0.01$     <sup>c</sup>  $p < 0.001$

Appendix Table D.19  
**Applications for an NIH or NSF Research Grant by FY 1994 for Biomedical Ph.D.s  
 by Group and NRSA Postdoctoral Training**

Group and NRSA Postdoctoral Support		Fiscal Year of Doctorate				Total
		1981-82	1983-84	1985-86	1987-88	
<b>Both NRSA pre-and postdoctoral support</b>	N	735	831	725	690	2,981
Percent who applied	%	66.5	62.0	50.2	44.2	56.1
Percent of applicants awarded funds	%	77.1	67.2	69.2	57.4	68.7
<b>Only NRSA predoctoral support</b>	N	893	1,003	1,108	1,140	4,144
Percent who applied	%	45.8	42.8	41.7	32.5	40.3
Percent of applicants awarded funds	%	71.9	68.1	62.6	56.3	64.9
<b>Ph.D.s from NIH training institutions with NRSA postdoctoral support</b>	N	741	674	609	557	2,581
Percent who applied	%	64.6	54.6	50.2	38.4	53.0
Percent of applicants awarded funds	%	68.7	59.5	57.5	53.7	61.4
<b>Ph.D.s from non-NIH training institutions with NRSA postdoctoral support</b>	N	525	483	395	371	1,744
Percent who applied	%	58.5	52.4	50.1	36.9	50.5
Percent of applicants awarded funds	%	58.6	56.1	52.5	38.0	53.4
<b>Ph.D.s from NIH training institutions without NRSA postdoctoral support</b>	N	1,859	1,673	1,851	2,019	7,404
Percent who applied	%	34.1	32.6	28.7	20.6	28.7
Percent of applicants awarded funds	%	54.4	53.7	47.7	45.8	50.9
<b>Ph.D.s from non-NIH training institutions without NRSA postdoctoral support</b>	N	1,888	1,929	1,735	1,903	7,455
Percent who applied	%	29.2	28.1	24.4	16.7	24.6
Percent of applicants awarded funds	%	47.6	45.9	40.7	40.1	44.2

*Note.* The data are from the NRC Doctorate Records File (1994), the NIH Consolidated Grants and Application File (1995), the NIH Trainee and Fellow File (1994), and the NSF Master Database of Proposals and Awards (1995). The NRSA group includes those who had at least nine months of F30, F31, or T32 predoctoral support. To qualify as receiving an NRSA postdoctoral appointment, individuals must: (a) have had at least nine months of NRSA postdoctoral support; (b) have it being no earlier than approximately 12 months prior to the formal awarding of their last known doctoral degree; (c) have begun the appointment within 4 years of this degree; and (d) have had an award with the activity codes of F32, F35, and T32. Applying for an NIH or NSF research grant is defined as having submitted at least one research grant application or proposal to either the NIH or the NSF no earlier than 12 months prior to receipt of their last known doctoral degree. NIH research grant applications include the activity codes R01, R22, R23, R29, R35, R37, R43, R44, P01, U01, and NIGMS P41 for FY 1980 and later; excluded are NLM for all years, NCNR for FY 1986, NCRR for applications prior to FY 1990, and U01 for FY 1980-81.

<sup>a</sup>  $p < 0.05$     <sup>b</sup>  $p < 0.01$     <sup>c</sup>  $p < 0.001$

Appendix Table D.20  
**Estimated Standardized Coefficients for Regressions on Submitting One or More  
 Research Grant Applications to the NIH or NSF by FY 1994: 1981-88 Biomedical Ph.D.s**

Independent Variable	NRSA vs. NIH Training Institution (n=1,142)	NRSA vs. Non-NIH Training Institution (n=1,032)
	Coefficient	Coefficient
<i>Demographic variables:</i>		
Gender (female)	-0.05	-0.04
Underrepresented minority	-0.04	-0.04
Age at entry into graduate school	0.01	-0.06
<i>Ph.D. cohort</i>	-0.14 <sup>b</sup>	-0.12 <sup>b</sup>
<i>Reputational ranking of educational institutions:</i>		
B.A. degree from highly selective institution	0.03	0.01
Reputational ranking of Ph.D. institution	0.04	0.02
<i>Field of doctorate(s):</i>		
Ph.D. in field with high levels of postdoctoral participation	0.22 <sup>b</sup>	0.30 <sup>c</sup>
Ph.D. in field with moderate levels of postdoctoral participation	0.12	0.24 <sup>c</sup>
<i>Primary source of graduate support</i>		
RA	-0.11 <sup>a</sup>	-0.07
TA	0.06	-0.03
Earnings from employment	-0.07	-0.16 <sup>c</sup>
<i>Time enrolled in graduate school</i>		
Years not enrolled between entry and Ph.D.	-0.01	-0.08
Years formally enrolled in graduate study	-0.02	0.02
<i>Postdoctoral training:</i>		
Had NRSA postdoctoral training	0.58 <sup>c</sup>	0.46 <sup>c</sup>
Had postdoctoral training (but not NRSA)	0.59 <sup>c</sup>	0.46 <sup>c</sup>
Length of postdoctoral training	-0.13 <sup>a</sup>	-0.21 <sup>c</sup>
<i>Post-PhD employment:</i>		
Had tenure-line appointment at some time	0.79 <sup>c</sup>	0.76 <sup>c</sup>
Had non-tenure line appointment at some time	0.15 <sup>b</sup>	0.10
Had position at institution in the top quartile of institutions with biomedical doctoral programs	0.09	0.20 <sup>c</sup>
<i>NRSA predoctoral trainee or fellow</i>	-0.05	-0.05
Total R <sup>2</sup>	0.42	0.37

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995), the NIH Consolidated Grants and Application File (1994), and the NSF Survey of Doctorate Recipients (1995). Samples included those individuals who responded to the 1995 Survey of Doctorate Recipients. Those disciplines in which at least 70 percent of 1981-92 Ph.D.s had definite plans for postdoctoral training are classified as fields in which postdoctoral training is the typical expectation. The *ns* reported for each comparison are sample estimates.

<sup>a</sup> p < 0.05      <sup>b</sup> p < 0.01      <sup>c</sup> p < 0.001

**Estimated Standardized Coefficients for Regressions on Receiving One or More Research Grants from the NIH or NSF by FY 1994: 1981-88 Biomedical Ph.D. Applicants**

Independent Variable	NRSA vs. NIH Training Institution (n=484)	NRSA vs. Non-NIH Training Institution (n=432)
	Coefficient	Coefficient
<i>Demographic variables:</i>		
Gender (female)	-0.02	0.01
Underrepresented minority	-0.05	0.03
Age at entry into graduate school	-0.03	-0.04
<i>Ph.D. cohort</i>	-0.05	-0.03
<i>Reputational ranking of educational institutions:</i>		
B.A. degree from highly selective institution	0.11	0.14
Reputational ranking of Ph.D. institution	0.15 <sup>b</sup>	0.33 <sup>c</sup>
<i>Field of doctorate(s):</i>		
Ph.D. in field with high levels of postdoctoral participation	0.12	0.27 <sup>b</sup>
Ph.D. in field with moderate levels of postdoctoral participation	0.01	0.19 <sup>c</sup>
<i>Primary source of graduate support</i>		
RA	0.03	0.18 <sup>a</sup>
TA	-0.05	0.07
Earnings from employment	-0.14 <sup>b</sup>	-0.10
<i>Time enrolled in graduate school</i>		
Years not enrolled between entry and Ph.D.	0.05	0.01
Years formally enrolled in graduate study	-0.17 <sup>b</sup>	-0.30 <sup>c</sup>
<i>Postdoctoral training:</i>		
Had NRSA postdoctoral training	0.06	0.49 <sup>c</sup>
Had postdoctoral training (but not NRSA)	-0.08	0.48 <sup>c</sup>
Length of postdoctoral training	-0.01	-0.30 <sup>c</sup>
<i>Post-Ph.D. employment:</i>		
Had tenure-line appointment at some time	0.28 <sup>c</sup>	0.22 <sup>c</sup>
Had non-tenure line appointment at some time	0.06	0.02
Had position at institution in the top quartile of institutions with biomedical doctoral programs	0.10	0.13 <sup>c</sup>
<i>NRSA predoctoral trainee or fellow</i>	0.30 <sup>c</sup>	0.16
Total R <sup>2</sup>	0.19	0.26

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995), the NIH Consolidated Grants and Application File (1994), and the NSF Survey of Doctorate Recipients (1995). Samples included those individuals who responded to the 1995 Survey of Doctorate Recipients. Those disciplines in which at least 70 percent of 1981-92 Ph.D.s had definite plans for postdoctoral training are classified as fields in which postdoctoral training is the typical expectation. The *ns* reported for each comparison are sample estimates.

<sup>a</sup> p < 0.05      <sup>b</sup> p < 0.01      <sup>c</sup> p < 0.001

Appendix Table D.22

**Post-Ph. D. Publication Counts and Citation Rates for 1981-82 and 1987-88 Biomedical Ph.D.s**

Variable and Group	Fiscal Year of Doctorate							
	1981-82				1987-88			
	Median	Mean	SE	N	Median	Mean	SE	N
<b>Total number of post-Ph.D. publications</b>								
NRSA trainees and fellows	8.50	12.75	0.76	290	4.00	6.55	0.40	379
Ph.D.s from NIH training institutions	5.00	9.74	0.57	446	3.00	5.21	0.28	515
Ph.D.s from non-NIH training institutions	4.00	8.87	0.59	410	2.00	5.47	0.33	441
Total, all groups	6.00	10.21	0.37	1,146	3.00	5.72	0.19	1,335
<b>Publications 1-7 years post-Ph.D.</b>								
NRSA trainees and fellows	5.00	5.98	0.33	290	3.00	5.67	0.34	379
Ph.D.s from NIH training institutions	3.00	5.09	0.26	446	2.00	4.72	0.25	515
Ph.D.s from non-NIH training institutions	3.00	4.92	0.29	410	2.00	5.05	0.31	441
<b>Average citations per post-Ph.D. article</b>								
NRSA trainees and fellows	22.00	28.52	1.57	255	15.94	27.01	2.02	299
Ph.D.s from NIH training institutions	16.00	24.72	1.93	351	12.57	18.44	1.25	357
Ph.D.s from non-NIH training institutions	13.00	18.94	1.23	318	10.55	15.83	1.28	300
<b>Effect sizes</b>								
<b>Total number of post-Ph.D. publications</b>								
NRSA vs. NIH training institutions		0.34 <sup>c</sup>				0.20 <sup>b</sup>		
NRSA vs. Non-NIH training institutions		0.42 <sup>c</sup>				0.24 <sup>b</sup>		
NIH vs. Non-NIH training institutions		0.08				-0.04		

Appendix Table D.22 (continued)  
**Post-Ph. D. Publication Counts and Citation Rates for 1981-82 and 1987-88 Biomedical Ph.D.s**

Variable and Group	Fiscal Year of Doctorate	
	1981-82	1987-88
<b>Effect sizes (continued)</b>		
<b>Publications 1-7 years post-Ph.D.</b>		
NRSA vs. NIH training institutions	<i>0.22<sup>b</sup></i>	0.16 <sup>a</sup>
NRSA vs. non-NIH training institutions	<i>0.22<sup>b</sup></i>	0.18 <sup>a</sup>
NIH vs. non-NIH training institutions	0.00	-0.02
<b>Average citations per post-Ph.D. article</b>		
NRSA vs. NIH training institutions	<i>0.34<sup>c</sup></i>	<i>0.28<sup>c</sup></i>
NRSA vs. non-NIH training institutions	<b>0.53<sup>c</sup></b>	<i>0.47<sup>c</sup></i>
NIH vs. non-NIH training institutions	0.17 <sup>a</sup>	<i>0.20<sup>c</sup></i>

*Note.* Data sources were the NIH Trainee and Fellow File (1994), the NRC Doctorate Records File (1994), and the Institute for Scientific Information. The NRSA group includes those who had at least nine months of F30, F31, or T32 support. All statistical tests and effect sizes were performed on the log transformations of the respective variables. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference considered moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$       <sup>b</sup>  $p < 0.01$       <sup>c</sup>  $p < 0.001$

Appendix Table D.23  
**Post-Ph.D. Publication Counts and Citation Rates for 1981-82 and 1987-88 Ph.D.s  
 in Fields with High Proportions of Postdocs**

Variable and Group	Fiscal Year of Doctorate							
	1981-82				1987-88			
	Median	Mean	SE	N	Median	Mean	SE	N
<b>Total number of post-Ph.D. publications</b>								
NRSA trainees and fellows	9.00	13.13	0.88	226	5.00	6.52	0.46	264
Ph.D.s from NIH training institutions	7.00	11.66	0.82	285	4.00	5.98	0.35	262
Ph.D.s from non-NIH training institutions	7.00	13.16	0.89	227	4.00	6.34	0.47	212
<b>Average citations per post-Ph.D. article</b>								
NRSA trainees and fellows	23.00	32.05	1.94	196	18.36	31.18	2.55	219
Ph.D.s from NIH training institutions	19.82	28.95	2.41	236	15.68	21.32	1.53	210
Ph.D.s from non-NIH training institutions	16.44	23.20	1.80	188	11.80	17.25	1.49	159
<b>Effect sizes</b>								
<b>Total number of post-Ph.D. publications</b>								
NRSA vs. NIH training institutions			<i>0.22<sup>b</sup></i>				0.06	
NRSA vs. non-NIH training institutions			<i>0.28<sup>b</sup></i>				0.03	
NIH vs. non-NIH training institutions			0.05				-0.03	
<b>Average citations per post-Ph.D. article</b>								
NRSA vs. NIH training institutions			0.17				<i>0.25<sup>b</sup></i>	
NRSA vs. non-NIH training institutions			<i>0.39<sup>c</sup></i>				<i>0.47<sup>c</sup></i>	
NIH vs. non-NIH training institutions			0.23 <sup>a</sup>				0.25 <sup>a</sup>	

*Note.* Data sources were the NIH Trainee and Fellow File (1994), the NRC Doctorate Records File (1994), and the Institute for Scientific Information. The NRSA group includes those who had at least nine months of F30, F31, or T32 support. All statistical tests and effect sizes were performed on the log transformations of the respective variables. The use of italics indicates that the effect size represents a potentially meaningful difference considered small in magnitude (between |0.20| and |0.49|); bold typeface designates a potentially meaningful difference that is moderate in magnitude (between |0.50| and |0.79|), and both italics and bold typeface signify a potentially meaningful difference considered large ( $\pm 0.80$  or larger).

<sup>a</sup>  $p < 0.05$       <sup>b</sup>  $p < 0.01$       <sup>c</sup>  $p < 0.001$

Appendix Table D.24

**Estimated Standardized Coefficients for Regressions on**

## Post-PhD Publication Counts: 1981-82 and 87-88 Biomedical Ph.D.s

Independent Variable	NRSA vs. NIH Training Institution (n = 545)	NRSA vs. Non-NIH Training Institution (n = 520)
	Coefficient	Coefficient
<i>Demographic variables:</i>		
Gender (female)	-0.19 <sup>c</sup>	-0.18 <sup>c</sup>
Underrepresented minority	-0.09 <sup>a</sup>	-0.05
Entered graduate school before age 30	0.00	-0.07
<i>Year of Ph.D.</i>	-0.13 <sup>c</sup>	-0.15 <sup>c</sup>
<i>Reputational ranking of educational institutions:</i>		
BA degree from highly selective institution	0.00	0.06
Reputational ranking of Ph.D. institution	-0.04	0.04
<i>Field of doctorate(s):</i>		
Ph.D. field with moderate levels of postdoctoral participation	-0.01	0.04
Ph.D. field with low levels of postdoctoral participation	-0.09	0.03
<i>Primary source of graduate support</i>		
RA	0.04	0.08
TA	0.04	0.08
Earnings from employment	-0.03	0.01
<i>Time enrolled in graduate school</i>	-0.06	-0.16 <sup>c</sup>
<i>Postdoctoral training</i>		
NRSA postdoctoral training	0.33 <sup>c</sup>	0.42 <sup>c</sup>
Other type of postdoctoral training (but not NRSA)	0.28 <sup>c</sup>	0.26 <sup>c</sup>
Time spent in postdoctoral training	-0.12 <sup>a</sup>	-0.05
<i>Post-Ph.D. employment:</i>		
Had tenure-line appointment at some time	0.19 <sup>c</sup>	0.17 <sup>c</sup>
Had non-tenure line appointment at some time	0.06	0.05
Had position at institution in the top quartile of those with with biomedical doctoral programs	0.05	0.04
<i>NRSA predoctoral trainee or fellow</i>	0.05	< 0.01
Total R <sup>2</sup>	0.25	0.31

Note. Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995), and the Institute for Scientific Information. The analyses were performed, using the logarithmic transformations of the number of articles.

<sup>a</sup> p < 0.05

<sup>b</sup> p < 0.01

<sup>c</sup> p < 0.001

Appendix Table D.25  
**Estimated Standardized Coefficients for Regressions on  
 Post-Ph.D. Citation Rates: 1981-82 and 1987-88 Biomedical Ph.D.s**

Independent Variable	NRSA vs. NIH Training Institution (n = 447)	NRSA vs. Non-NIH Training Institution (n = 424)
	Coefficient	Coefficient
<i>Demographic variables:</i>		
Gender (female)	0.04	0.10 <sup>a</sup>
Underrepresented minority	-0.05	0.04
Entered graduate school before age 30	0.00	0.06
<i>Year of Ph.D.</i>	-0.09 <sup>a</sup>	-0.02
<i>Reputational ranking of educational institutions:</i>		
BA degree from highly selective institution	0.02	0.02
Reputational ranking of PhD institution	0.12 <sup>b</sup>	0.12 <sup>a</sup>
<i>Field of doctorate(s):</i>		
Ph.D. field with moderate levels of postdoctoral training	-0.17 <sup>c</sup>	-0.11 <sup>a</sup>
Ph.D. field with low levels of postdoctoral training	-0.10 <sup>a</sup>	-0.13 <sup>a</sup>
<i>Primary source of graduate support</i>		
RA	-0.07	0.03
TA	-0.03	-0.07
Earnings from employment	-0.11 <sup>a</sup>	-0.07
<i>Time formally enrolled in graduate school</i>	-0.05	-0.07
<i>Postdoctoral training</i>		
NRSA postdoctoral training	-0.01	0.05
Other type of postdoctoral training (but not NRSA)	-0.05	0.02
Time spent in postdoctoral training	0.23 <sup>c</sup>	0.15 <sup>a</sup>
<i>Post-Ph.D. employment:</i>		
Had tenure-line appointment at some time	0.10 <sup>a</sup>	0.07
Had non-tenure line appointment at some time	-0.03	0.01
Had position at institution in the top quartile of those with biomedical doctoral programs	0.01	0.02
<i>Log of publications</i>	0.23 <sup>c</sup>	0.35 <sup>c</sup>
<i>NRSA predoctoral trainee or fellow</i>	0.01	0.08
Total R <sup>2</sup>	0.23	0.29

*Note.* Data are from the NRC Doctorate Records File (1994), the NIH Trainee and Fellow File (1994), Astin's 1991 Survey of Undergraduate Institutions, the NRC Research Doctorate Program Study (Goldberger, Maher, & Flattau, 1995), and the Institute for Scientific Information. The analyses were performed, using the logarithmic transformations of citation rates.

<sup>a</sup> p < 0.05

<sup>b</sup> p < 0.01

<sup>c</sup> p < 0.001