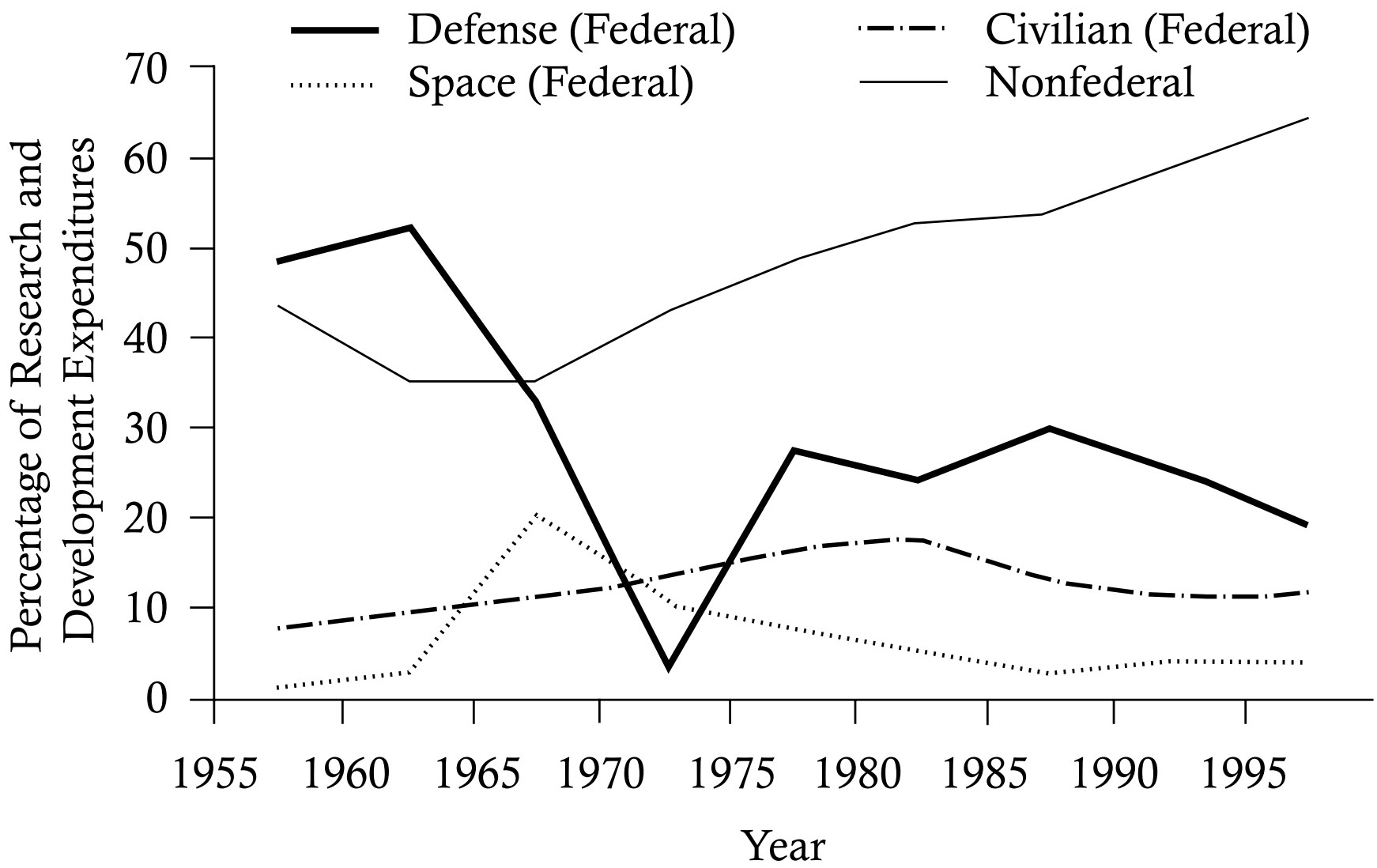
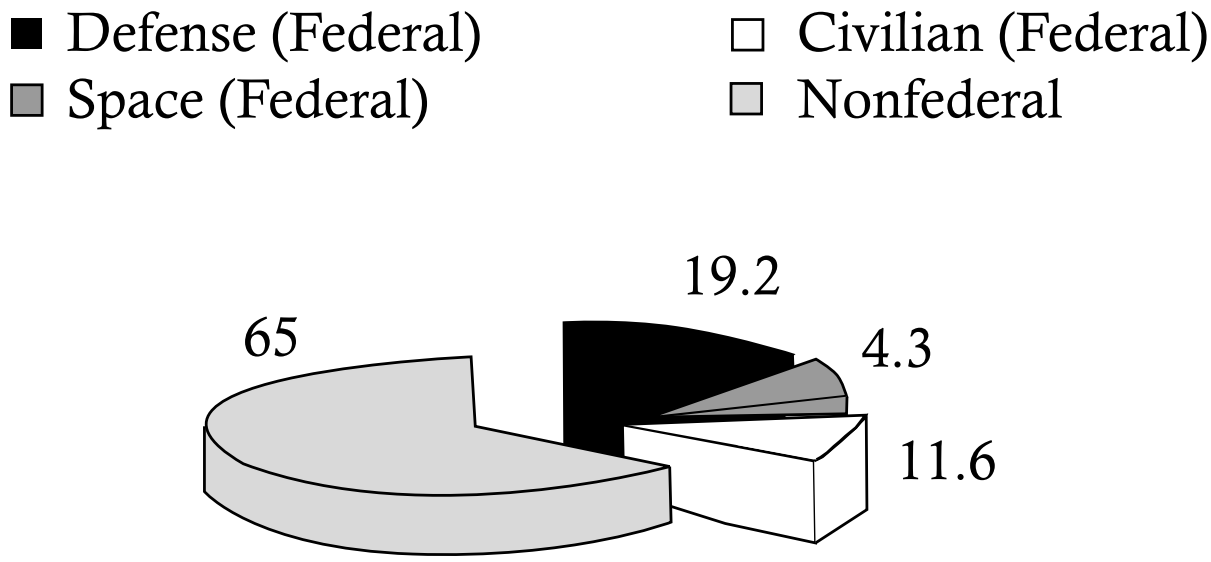
Figure 1.1 *Federal and Nonfederal Research and Development Expenditures*



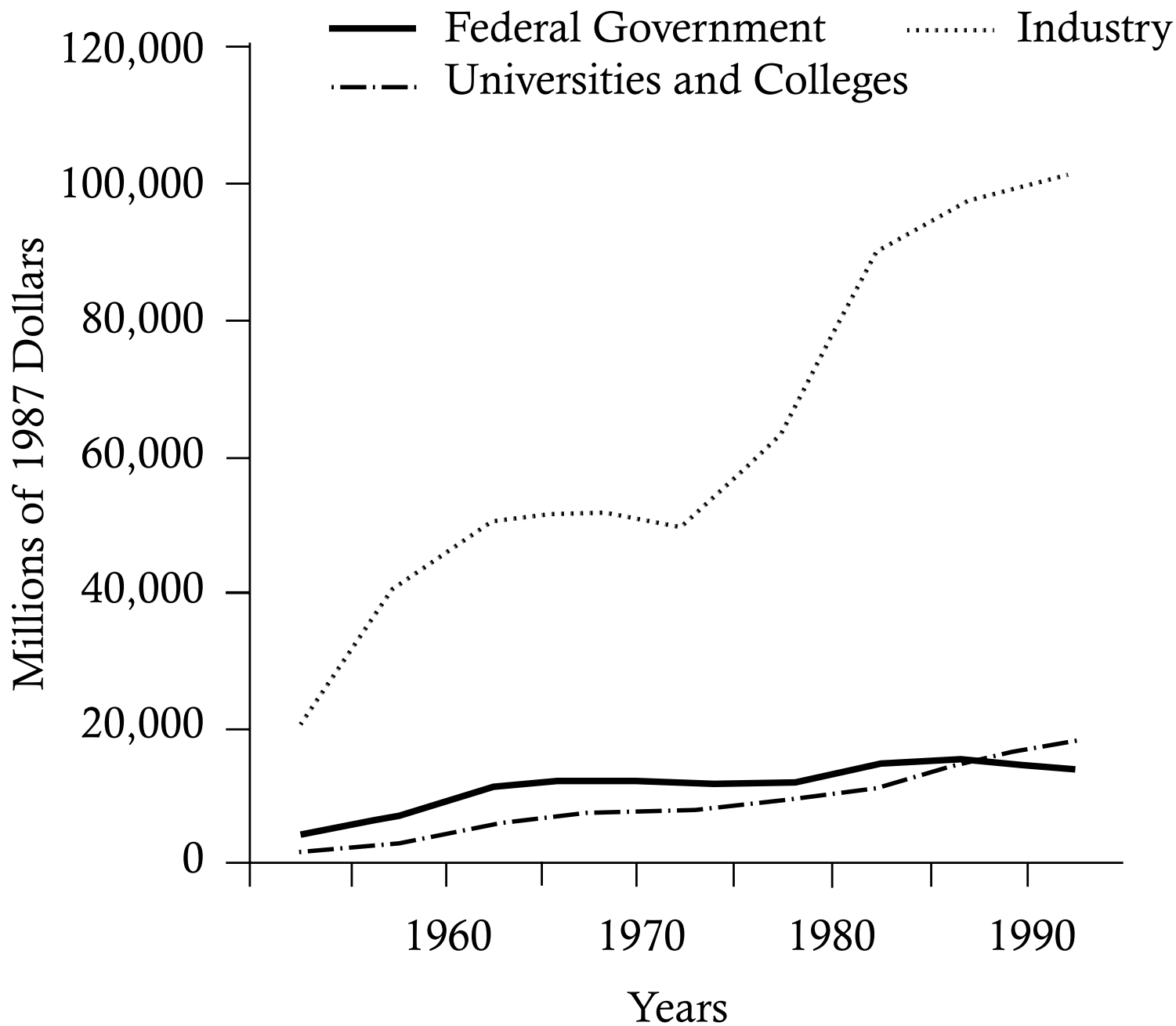
Source: Based on National Science Board 2002, table C-14.

Figure 1.2 Research and Development Expenditures 1995 (Percentages)



Source: Based on National Science Board 2002, table C-14.

Figure 1.3 Research and Development Performance by Sector



Source: Based on National Science Board 2002, table C-14.

Table 1.1 Descriptive Statistics for National Sample of Employed Scientists and Engineers, 1982 (Standard Deviations in Parentheses)

	Natural Scientists		Engineers	
	Women	Men	Women	Men
Age in years	36.6 (9.7)	41.5* (10.9)	32.3 (8.7)	42.8* (11.2)
Percentage never married	29.5	10.6*	31.1	9.2*
Percentage with children	33.4	54.0*	25.8	53.6*
Percentage with bachelor's degree	46.5	40.9*	63.0	57.7*
Percentage with master's degree	33.9	30.2*	19.7	21.8
Percentage with Ph.D.	18.9	28.2*	2.2	3.6*
Sample size	2913	8915	1839	24292

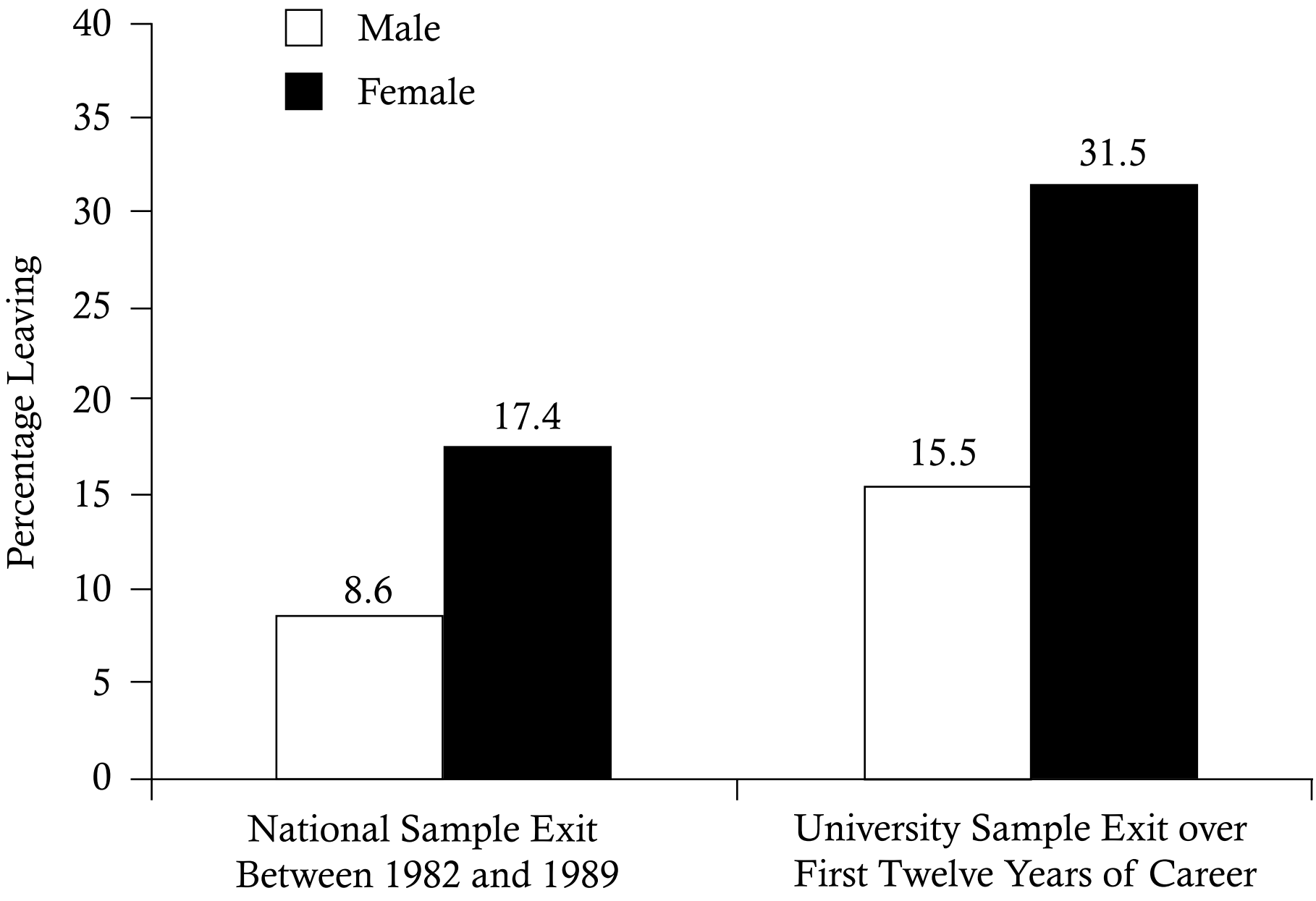
Source: Author's compilation.
*The male mean is significantly different from the female mean at the .01 level.

Table 1.2 Characteristics of Respondents to University Survey, 1992 to 1994 (Standard Deviations Are in Parentheses)

	Natural Scientists		Engineers	
	Women	Men	Women	Men
Age in years	35.4 (7.2)	36.4* (6.6)	33.5 (7.6)	34.8 (6.5)
Experience in years	9.4 (6.0)	10.7* (5.8)	7.1 (4.2)	10.3* (6.4)
Time at current job in years	5.8 (5.0)	6.6 (5.1)	4.8 (3.4)	6.1 (5.6)
Percentage highest science degree: bachelor's	72.7	59.6	47.3	60.5*
Percentage highest science degree: master's	19.4	16.9	47.3	34.2*
Percentage highest science degree: Ph.D.	12.9	23.5*	4.8	5.2
Percentage never married	33.3	29.0	36.9	36.8
Percentage with children	47.5	54.2	42.2	49.1
Sample size	782	421	185	290

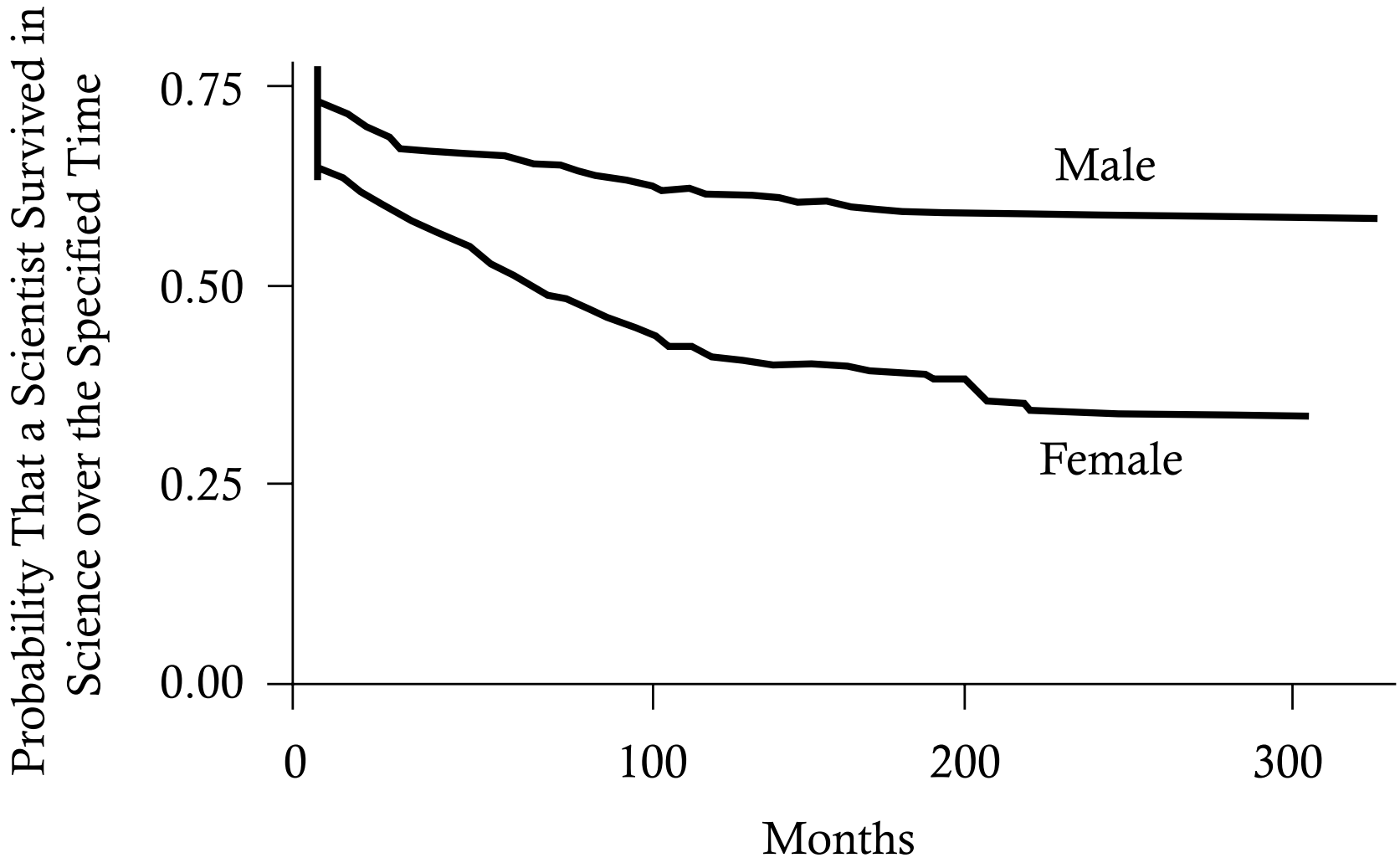
Source: Author's compilation.
*Female statistic is significantly different from the male statistic at the .01 level.

Figure 2.1 *Percentage Leaving Science by Gender, National Sample and University Sample*



Source: Author's compilation.

Figure 2.2 Kaplan–Meier Survival Estimates, by Sex

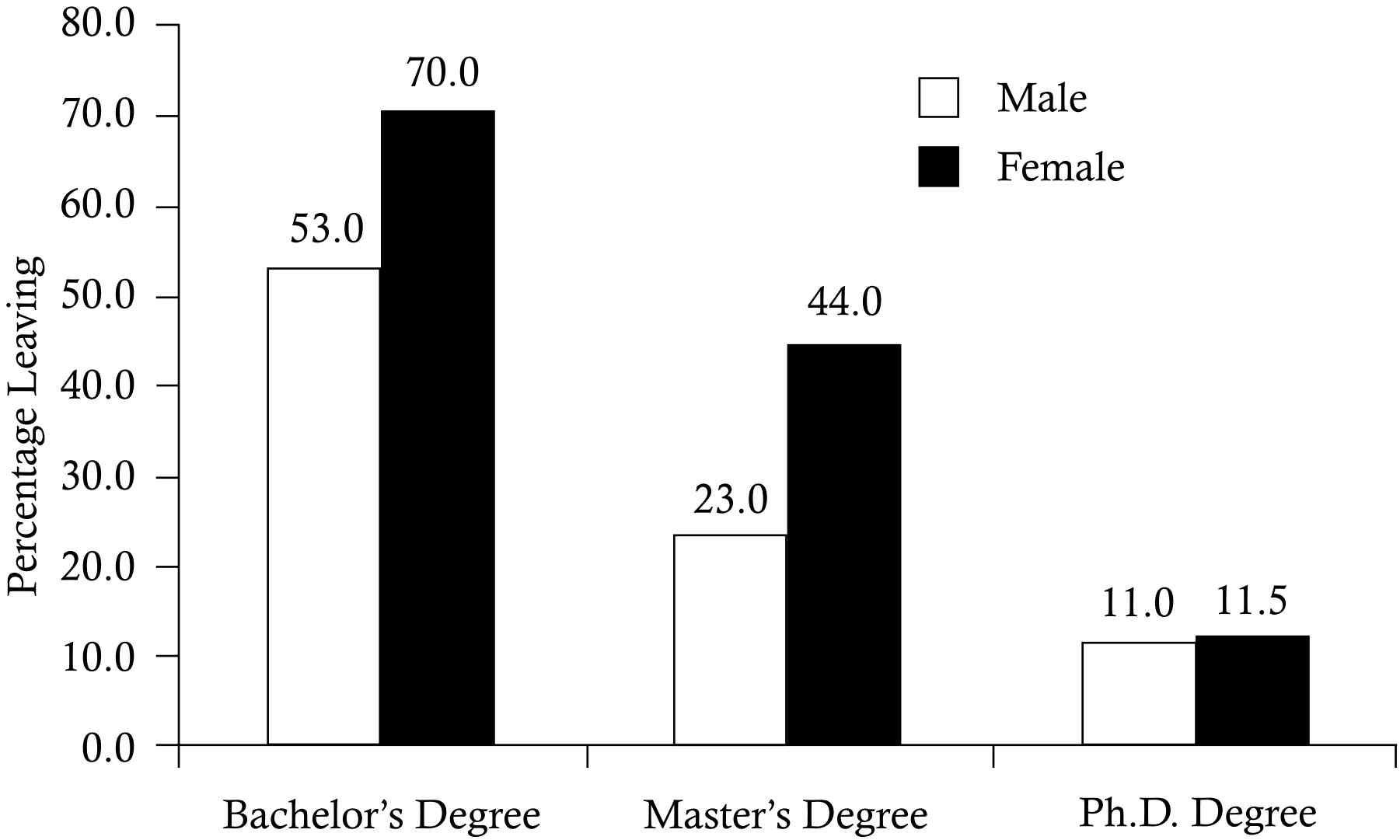


Source: Author's compilation.

Figure 2.3 Percentage Exiting by Destination

Source: Author's compilation.

Figure 2.4 *Percentage Leaving by Gender and Level of Science Degree, University Sample*



Source: Author's compilation.

Table 2.1 Nonscience Degrees Earned by Scientifically Trained Individuals Who Leave Science and Become Employed Outside of Science

	Began Science Career		Never Began Science Career	
Percentage Earning	Male (n = 83)	Female (n = 203)	Male (n = 191)	Female (n = 353)
Master's degrees	13.6	15.1	10.3	22.6
Ph.D. degrees	1.5	0.9	0.0	2.7
M.B.A degrees	15.2	13.4	5.1	3.8
M.D. degrees	13.6	16.1	42.3	27.1
J.D. degrees	6.1	3.6	3.4	2.4
Total[a]	42.4	45.5	59.4	54.1

Source: Author's compilation.

[a]Some respondents earned more than one degree, so the individual rows add up to a sum that is greater than the total.

Table 2.2 Most Common Work Activities and Industries of Leavers (Percentages Are Given in Parentheses)

	Began Science Career		Never Began Science Career	
	Male (n = 83)	Female (n = 203)	Male (n = 191)	Female (n = 353)
Work activities				
Most common	Management (28.8)	Management (17.1)	Clinical diagnosis (32.4)	Teaching and training (33.9)
Second most common	Clinical diagnosis (10.6)	Clinical diagnosis (16.2)	Teaching and training (14.5)	Clinical diagnosis (21.6)
Third most common	Distribution and sales (9.1)	Teaching and training (13.5)	Management (13.3)	Physician-related health care (9.9)
Fourth most common	Teaching and training (7.6)	Computer applications (6.3)	Physician-related health care (12.7)	Management (9.6)
Industry				
Most common	Finance, insurance, and real estate (21.5)	Hospital or clinic (12.7)	Hospital or clinic (26.6)	Elementary and secondary school (24.0)
Second most common	Hospital or clinic (12.3)	Other health-related (11.8)	Other health-related (15.0)	Hospital or clinic (21.3)
Third most common	Other services (7.7)	Elementary and secondary school (10.9)	Elementary and secondary school (11.6)	Finance, insurance, and real estate (12.0)
Fourth most common	Elementary and secondary school (6.2)	Finance, insurance, and real estate (10.9)	Finance, insurance, and real estate (8.1)	Other health-related (10.0)

Source: Author's compilation.

Table 2.3 Reasons Why Men and Women Left Science

Percentage Who Cited:	Men	Women
Pay better in nonscience and engineering positions	68.0%	33.0%
Career opportunities lacking	64.0	34.0
Other fields more interesting	36.0	30.0
Science and engineering positions not available	34.0	21.4
Preferred other positions	23.0	35.0
Promoted out of science	18.0	2.9
Impossible to have a family and work in science and engineering	4.5	21.4
Demands of the career are too severe	4.5	2.9
Hours required are too long	0	20.0
Science and engineering unfriendly to women	0	19.0

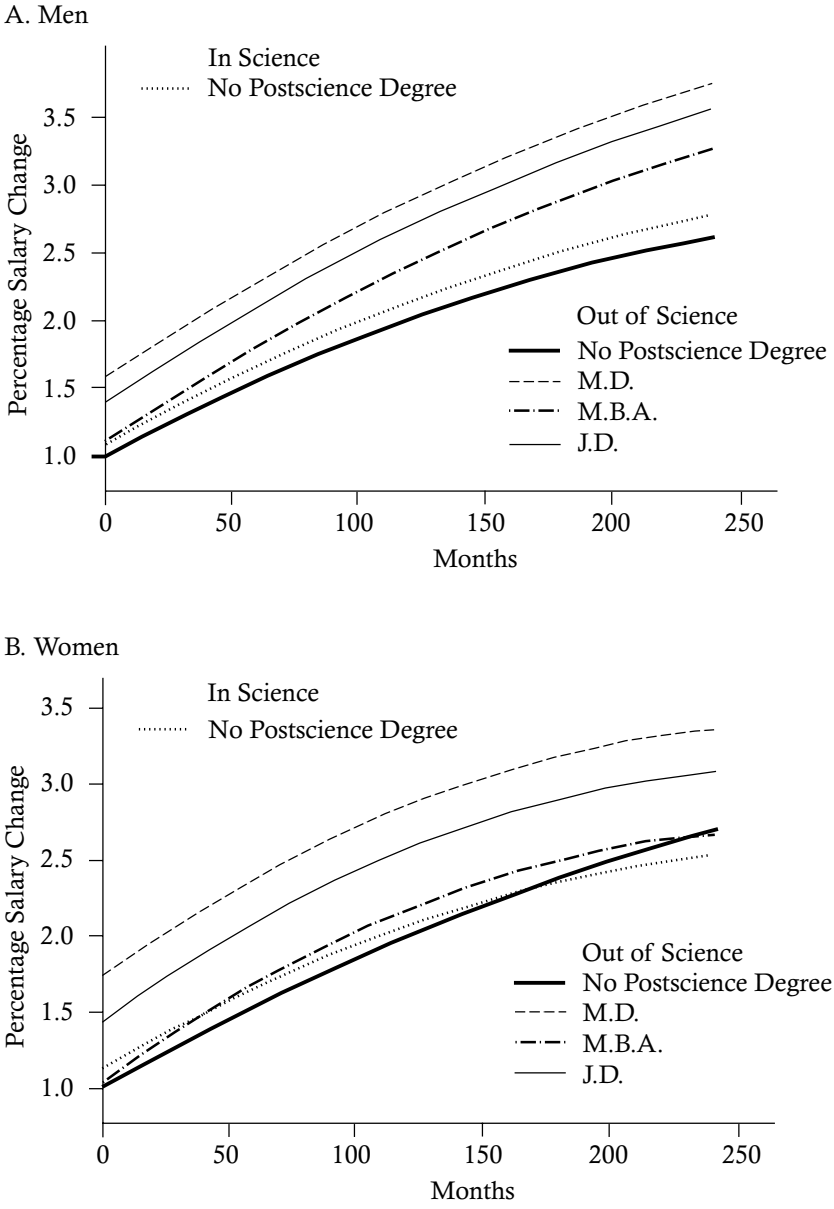
Source: Author's compilation.
Note: Work history sample: n = 1,688.

Table 2.4 Factors Differentiating Leaver from Stayer in Interview Pairs

	Men	Women
Discontent with income and opportunity in science		
Primary factor	15	1
Secondary factor	0	1
Looking for more interesting work outside of science		
Primary factor	3	8
Secondary factor	6	1
Lack of mentor or guidance		
Primary factor	0	7
Secondary factor	0	1
Difficulty shouldering familial and career responsibilities		
Primary factor	1	6
Secondary factor	0	1
Number of pairs for which a factor differentiating leaver from stayer could be identified	19	22

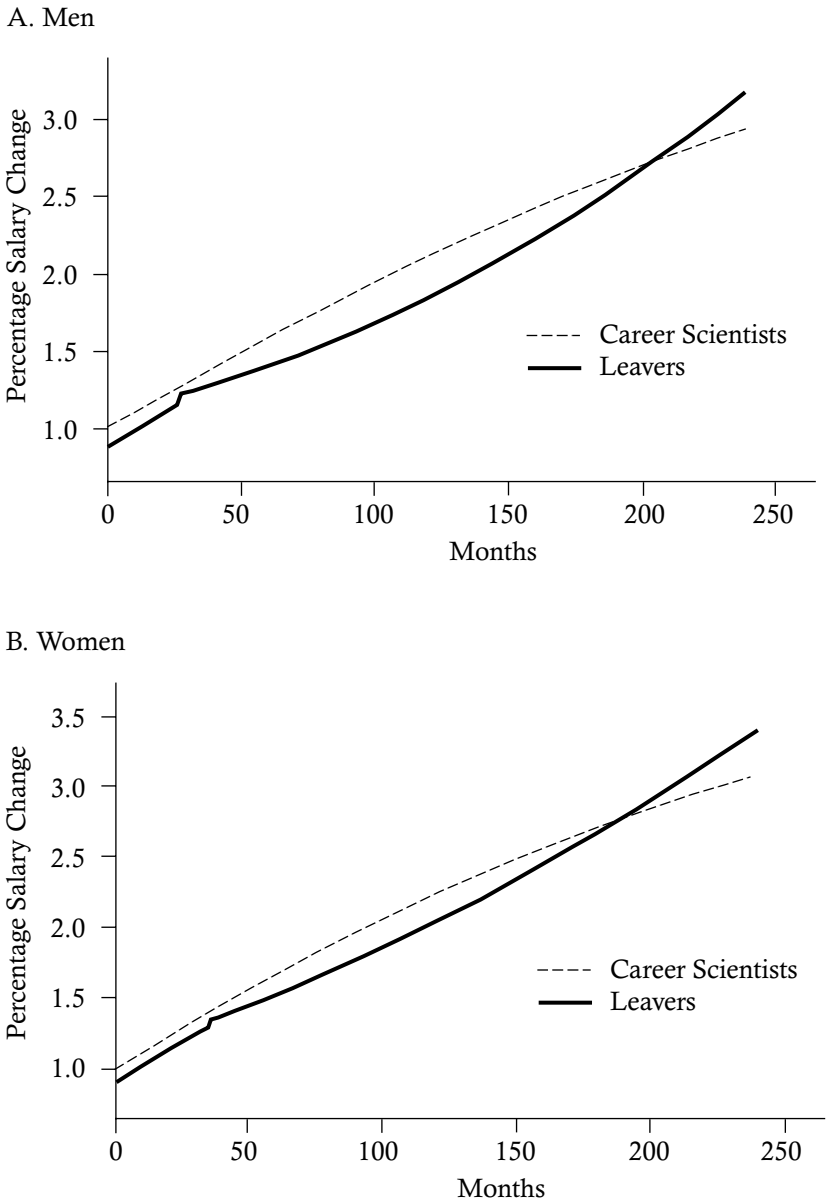
Source: Author's compilation.

Figure 3.1 Career Scientists Versus Career Nonscientists



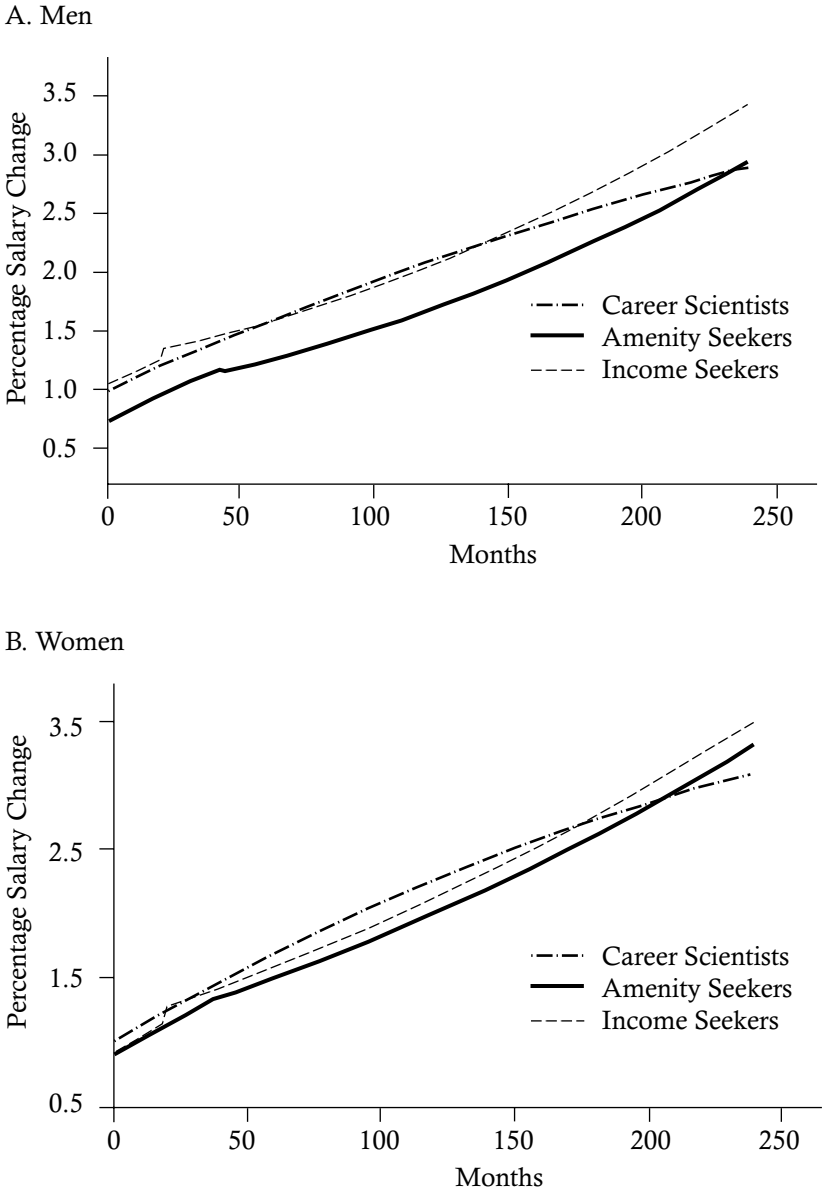
Source: Author's compilation.
Note: The average starting salary of respondents who are out of science without a postscience degree is normalized at one with percentage salary changes measured on the vertical axis. 1.5 on the vertical axis corresponds to a salary that is 50 percent above the starting salary of a respondent who is out of science and has no postscience degree.

Figure 3.2 *Comparison of Salaries of Career Scientists and Leavers*



Source: Author's compilation.
Note: Starting salary of the male career scientist is normalized at one with all changes interpreted as percentage changes: 1.5 on the vertical axis corresponds to a salary that is 50 percent above the starting salary of male career scientists.

Figure 3.3 *Comparison of Salaries of Career Scientists and Leavers by Reasons for Leaving*



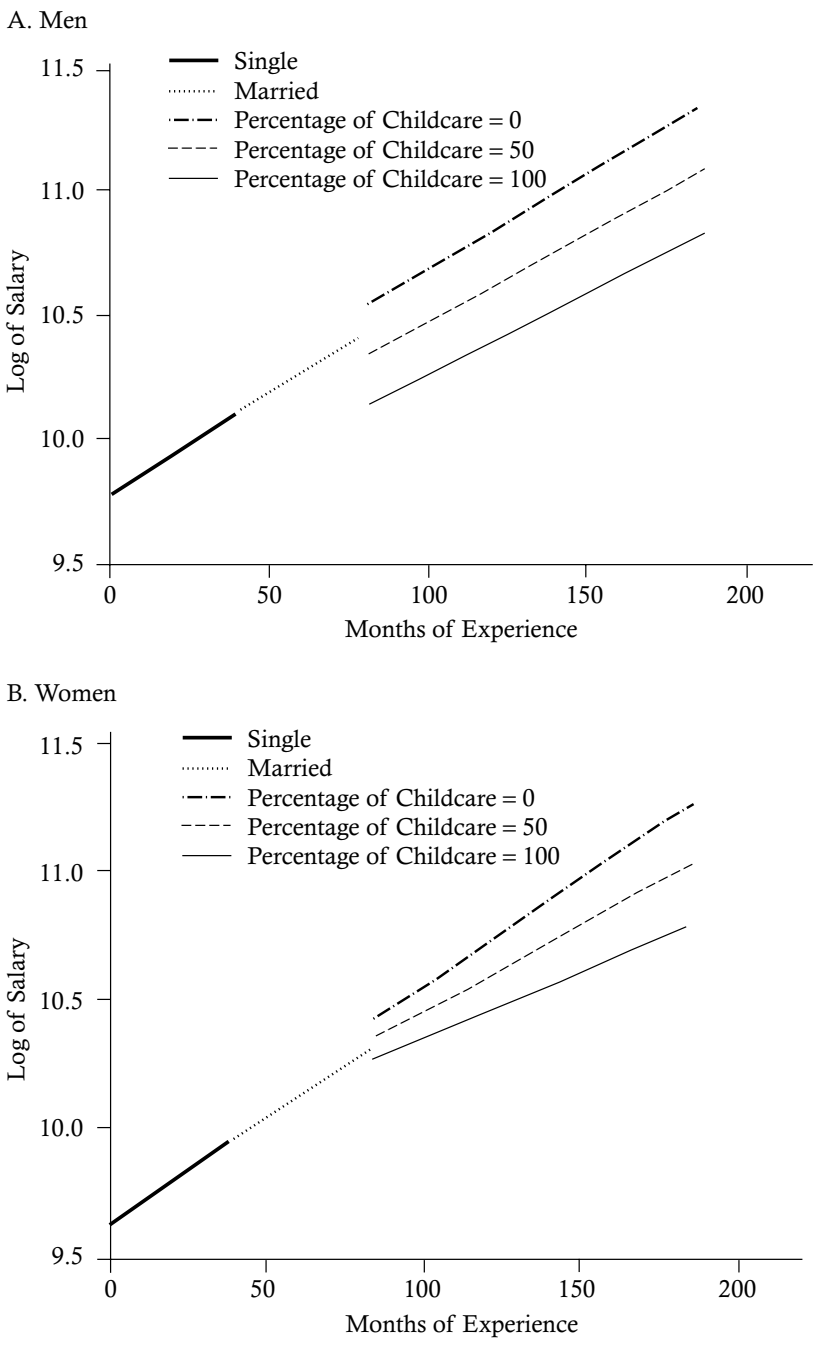
Source: Author's compilation.
Note: Starting salary of the male career scientist is normalized at one with all changes interpreted as percentage changes: 1.5 on the vertical axis corresponds to a salary that is 50 percent above the starting salary of male career scientists.

Table 3.1 Percentage Change in Salary for Men and Women Leaving Science

	Male	Female
1. All leavers	4 percent salary loss*	10 percent salary loss*
2. Income-seeking leavers	4 percent salary gain*	No change
3. Amenity-seeking leavers	12 percent salary loss*	13 percent salary loss*

Source: Author's compilation.
*Change in salary is statistically significant at the 0.01 level.

Figure 4.1 *Salary Experience Profiles While Single, Married, and Parenting*



Source: Author's compilation.

Table 4.1 Impact of Spouse's Career and Family Responsibilities

	Women	Men
Number of respondents with spouses	703	507
1. Percentage of respondents whose spouses earned an advanced degree	56.8*	34.4
2. Percentage of respondents whose spouses predominantly worked full-time during the marriage	95.7*	56.6
3. Percentage of respondents who altered location decisions to satisfy spouse's career	44.6*	23.4
4. Percentage of respondents who sacrificed career opportunities and work effort to satisfy spouse's career	24.6*	11.6
5. Percentage of household chores spouse is responsible for	34.8*	65.1
	(17.8)	(16.4)
Number of respondents with children	449	363
6. Percentage of childcare spouse is responsible for	15.1*	67.0
	(13.9)	(26.3)
7. Percentage of childcare individual is responsible for	60.2*	17.6
	(27.9)	(15.4)
8. Percentage of respondents who took time off from work to care for children	36.3	0.0

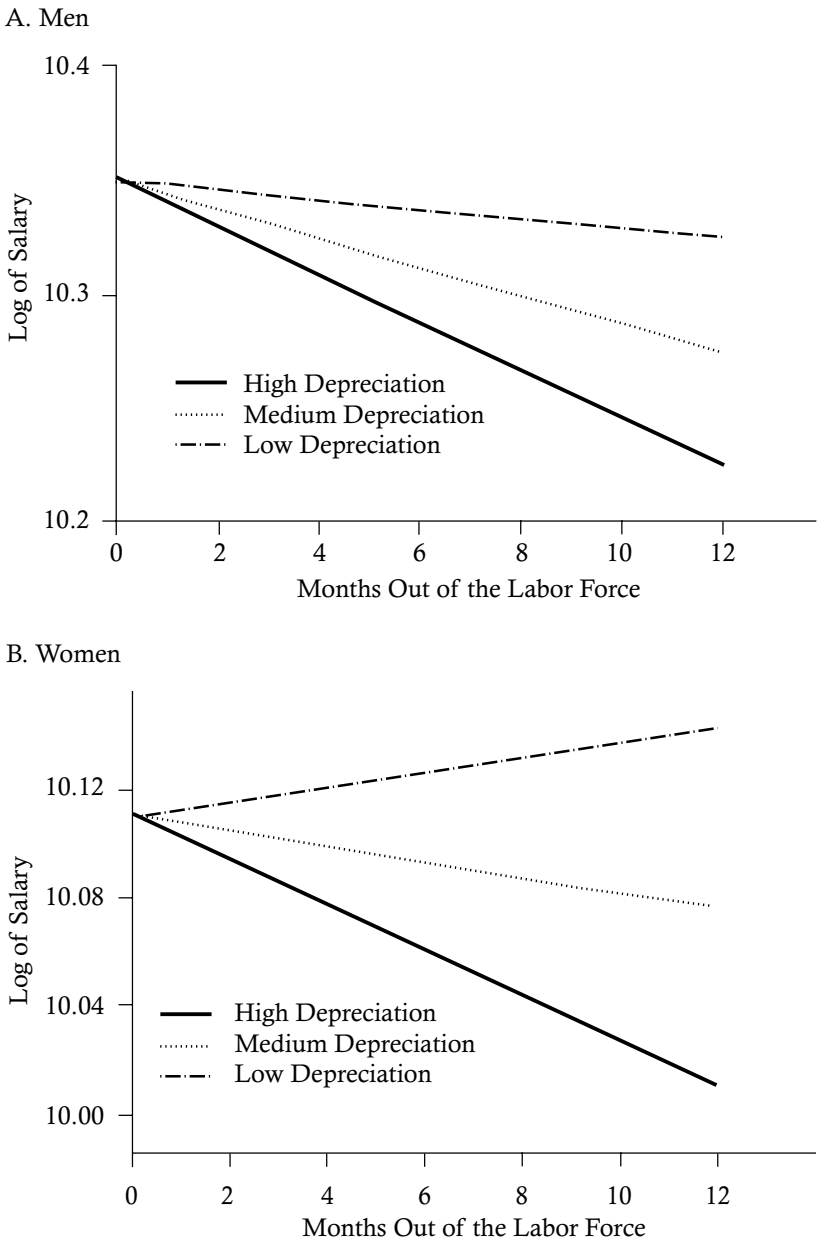
Source: Author's compilation.
*Percentage for women is significantly different than percentage for men at the .01 level.

Table 4.2 Effect of Marriage and Children on Employment in Science

	Marriage	Children
Women with Ph.D.s (n = 113)	11 percent less likely to work in science if married*	No effect
Men with Ph.D.s (n = 118)	12 percent more likely to work in science if married*	No effect
Women without Ph.D.s (n = 862)	No effect	17 percent less likely to work in science if with children*
Men without Ph.D.s (n = 591)	No effect	No effect

Source: Author's compilation.
*Effects are significantly different from zero at the .01 level.

Figure 7.1 *Log of Salary at Reentry to Science for Men and Women Who Left the Labor Force but Did Not Go to School*



Source: Author's compilation.

Table 7.1 Citing Half-Lives in 1975 and 1992 for Selected Fields (Ranked According to Percent Change in CITE)

Field	Percent Change in CITE–1975 to 1992	CITE–1975	CITE–1992	Percent Female[a]
1. Astronomy	42.0	4.62	6.56	0.097
2. Physics	41.4	4.74	6.70	0.097
3. Operations research	35.7	6.22	8.44	0.112
4. Geology	31.3	6.13	8.05	0.129
5. Mathematics	24.1	7.80	9.68	—
6. Applied mathematics	21.5	6.78	8.24	0.311
7. Environmental biology	18.0	5.89	6.95	—
8. Applied physics	15.2	4.29	4.94	0.156
9. Paleontology	15.2	8.24	9.49	—
10. Computer science	15.2	5.27	6.07	0.293
11. Chemistry	12.4	5.71	6.42	0.292
12. Agronomy	6.6	8.93	9.52	—
13. Microbiology	–1.4	5.57	5.49	—
14. Immunology	–1.6	3.82	3.74	0.382
15. Ecology	–4.7	7.87	7.50	—
16. Marine biology	–8.7	8.95	8.17	—
17. Biochemistry	–13.7	4.22	3.64	0.341
18. Genetics	–14.9	4.30	3.66	—
19. Cell biology	–18.6	4.78	3.89	—
20. Parasitology	–21.7	7.42	5.81	—
21. Neurobiology	–25.3	6.59	4.92	—
22. Biology	–29.5	6.77	4.77	0.281

Source: Author's compilation.
Note: A positive percent change means that knowledge growth has slowed.
[a]Percent female is calculated from working scientists in 1982 in the Survey of Natural and Social Scientists and Engineers.

bottom of the chart, however, have the lowest and most negative percentage change in CITE. For these fields, the growth of knowledge has been increasing most rapidly. The changing values of CITE are consistent with changing national priorities. Over the period, public and gov-

Table 7.2 Average Citing Half-Lives of Men and Women at Graduation and at Survey Date

	CITE at Graduation	CITE at Survey Date	Total Change in CITE	Average Monthly Change in CITE
Men	6.53*	6.48*	–0.056*	–0.003*
	(1.33)	(1.67)	(1.438)	(0.017)
Women	6.75	6.26	–0.481	–0.007
	(1.25)	(1.85)	(1.484)	(0.017)

Source: Author's compilation.
*Male mean is significantly different than female mean at the 0.01 level using a one-tailed test.

Table 8.1 Differences in Postgraduate Attachment to Science by Sex (Percentages)

	Male Science Graduates (n = 711)	Female Science Graduates (n = 977)
Percentage who never start a science career	27.4	36.5
Of those who start a Ph.D. program, percentage who never finish	15.0	32.0
Of those who start a science career, percentage who exit science	15.5	31.5

Source: Author's compilation.

Table 8.2 Female Salary Differentials (Percentages)

Controls	NSF All Workers[a] (n = 37,959)	NSF Full-Time Workers[a] (n = 37,119)	Work History All Workers[a] (n = 1,503)	Work History Full-Time Workers[a] (n = 1,359)
1. None	–28	–25	–30	–24
2. Age	–22	–18	–27	–21
3. Experience	–21	–17	–25	–19
4. Experience and highest science degree	–22	–18	–26	–20
5. Experience, highest science degree, and engineering degree	–18	–15	–19	-15
6. Experience, highest science degree, engineering degree, and family characteristics	–16	–12	–19	–14
7. Experience, highest science degree, engineering degree, family characteristics, and percent of early childcare responsibilities and percent of household chores taken on		–3*	–6	

Source: Author's compilation.
[a]Worker counts are based on 1982 information for NSF data and time of survey for work history data.
*Differential is not significantly different from zero.

Table A.1 *Relevant Coefficients for Ordinary Least Squares Estimates of Salary Equations on University Data—Sample of Career Scientists and Career Nonscientists (Figure 3.1)*

Variable	Men	Women
Working in science	0.090***	0.103***
	(0.028)	(0.026)
Months of experience in science	0.005***	0.005***
	(0.0005)	(0.0006)
Months of experience in science squared	–0.00001***	–0.00002***
	1.83 e-06	2.67 e-06
Months of experience outside of science	0.005***	0.005***
	(0.0007)	(0.0006)
Months of experience outside of science squared	–0.00001***	–9.18 e-06***
	3.21 e-06	(2.24 e-06)
Months of experience outside of science—professional degree	0.0019***	0.0008*
	(0.0005)	(0.0005)
Postscience medical degree	0.464***	0.580***
	(0.040)	(0.039)
Postscience law degree	0.305***	0.296***
	(0.056)	(0.099)
Postscience M.B.A.	0.085*	–0.0066
	(0.050)	(0.083)
Postscience master's	0.057	0.038
	(0.043)	(0.036)
Postscience Ph.D.	–0.196	–0.032
	(0.200)	(0.087)
Master's in science	0.146***	0.095***
	(0.024)	(0.022)
Ph.D. in science	0.101***	0.128***
	(0.027)	(0.028)
Adjusted R squared	0.664	0.564
Sample size (person-observations)	2,175	2,763

Source: Author's compilation.
***Coefficient is significantly different from zero at the 0.01 level using a two-tailed test.
*Coefficient is significantly different from zero at the 0.10 level using a two-tailed test.

Table A.2 *Relevant Coefficients for Fixed-Effect Estimates of Salary Equations on University Data—Sample of Scientifically Educated Workers Who Start Science Careers (Figure 3.3)*

Variable	Men	Women
Out of science × amenity seeker	0.219**	0.087*
	(0.067)	(0.048)
Out of science × income seeker	0.122*	0.228***
	(0.070)	(0.081)
Out of science × months in science × amenity seeker	–0.006***	–0.002**
	(0.002)	(0.001)
Out of science × months in science × income seeker	–0.002*	-0.004
	(0.001)	(0.002)
Months in science	0.011***	0.012***
	(0.003)	(0.002)
Months in science squared	–0.00001***	–0.00001***
	(0.0000)	(0.0000)
Months outside of science	0.0052*	0.0069***
	(0.0032)	(0.0024)
Months outside of science squared	0.00002***	0.00002**
	(0.0000)	(0.0000)
Adjusted R squared	0.801	0.737
Sample size (person-observations)	1,597	2,039

Source: Author's compilation.
***Coefficient is significantly different from zero at .01 level using two-tailed test.
**Coefficient is significantly different from zero at .05 level using two-tailed test.
*Coefficient is significantly different from zero at .1 level using two-tailed test.

Table A.3 Characteristics of Amenity Seekers and Income Seekers by Sex

	Male Amenity Seeker	Male Income Seeker	Female Amenity Seeker	Female Income Seeker
Median duration of time in science (in months)	43	20	39	20
Log salary residual in regressions run on workers in science	–0.1828 (p = 0.0)	0.0576 (p = 0.32)	–0.0722 (p = 0.0)	–0.0570 (p = 0.14)

Source: Author's compilation.
Note: Figure in parentheses is p value associated with testing the null hypothesis that the average residual for stayers is equal to the average residuals for leavers.

Table A.4 *Relevant Coefficients for Ordinary Least Squares Estimates of Salary Equations on University Data: Sample of Science Leavers and Science Educated Who Never Enter Science*

Variable	Men	Women
In science × income-seeking leavers	0.1356***	0.0208
	(0.0549)	(0.0637)
In science × amenity-seeking leavers	–0.1091**	–0.0077
	(0.0436)	(0.0301)
Out of science × experience in science × income-seeking leavers	0.0058**	0.0019
	(0.0027)	(0.0033)
Out of science × experience in science × income-seeking leavers squared	–0.00004***	–0.00004
	(0.0029)	(0.00003)
Out of science × experience in science × amenity-seeking leavers	0.0033	–0.0012
	(0.0081)	(0.0024)
Out of science × experience in science × amenity-seeking leavers squared	–0.0002**	–0.00004
	(0.0001)	(0.00004)
Adjusted R squared	0.650	0.568
Sample size (person-observations)	576	1,152

Source: Author's compilation.
***Coefficient is significantly different from zero at the 0.01 level using a two-tailed test.
**Coefficient is significantly different from zero at the 0.05 level using a two-tailed test.

Table A.5 Probit Estimates of the Probability of Working in Science—University Data: Table 4.2

	Women with Ph.D.s	Women Without Ph.D.s	Men with Ph.D.s	Men Without Ph.D.s
Months of science experience	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)
Months of non-science experience	–0.018*** (0.000)	–0.004*** (0.000)	–0.002** (0.038)	–0.004*** (0.000)
Months out of labor force—nonscience education	—	–0.010*** (0.000)	–0.017** (0.020)	–0.003*** (0.000)
Months out of labor force—other reasons	–0.003* (0.051)	–0.005*** (0.000)	–0.012*** (0.000)	–0.005*** (0.000)
Married	–0.108** (0.011)	0.019 (0.348)	0.120** (0.014)	0.020 (0.421)
Children	–0.016 (0.728)	–0.172*** (0.000)	–0.034 (0.475)	–0.011 (0.711)
Log of likelihood function	–333.28	–2246.03	–295.37	–1433.42
Sample size (person-observations)	626	3,664	596	2,459

Source: Author's compilation.
Note: Coefficients have been translated to $\partial F/\partial x$, where F is the probability of working in science, and p values are given in parentheses.
***Coefficient is significantly different from zero at the 0.01 level using a two-tailed test.
**Coefficient is significantly different from zero at the 0.05 level using a two-tailed test.
*Coefficient is significantly different from zero at the 0.10 level using a two-tailed test.

Table A.6 Fixed-Effect Estimates of the Effects of Children and Share of Childcare Responsibilities on Salary Profiles—University Data: Figure 4.1

Variable	Men	Women
Children	0.1151***	0.1102**
	(0.0435)	(0.0583)
Percentage of childcare	–0.3954**	–0.1530*
	(0.1810)	(0.0915)
Months of experience, single	0.0080***	0.0080***
	(0.0003)	(0.0003)
Months of experience, married	0.0078***	0.0079***
	(0.0005)	(0.0004)
Months of experience, children	0.0075***	0.0083***
	(0.0004)	(0.0007)
Percentage of childcare × months of experience, children	–0.0010	–0.0032***
	(0.0014)	(0.0010)
Adjusted R squared	0.779	0.731
Sample size (person-observations)	2,857	3,870

Source: Author's compilation.
***Coefficient is significantly different from zero at the 0.01 level using a two-tailed test.
**Coefficient is significantly different from zero at the 0.05 level using a two-tailed test.
*Coefficient is significantly different from zero at the 0.10 level using a two-tailed test.

B. Results from Competing Hazards Analysis

Competing hazard analyses were used to determine how changing rates of skill depreciation in a field influence decisions to leave science temporarily or permanently. These procedures estimate the probability

Table A.7 Salary Effects of Temporary Labor Force Exit Figure 7.1—University Data

	Spell of Nonwork Is Less Than or Equal to Twelve Months		Spell of Nonwork Is Less Than or Equal to Twenty-four Months	
	(1) Men	(2) Women	(3) Men	(4) Women
Months out of the labor force	–0.0545***	–0.0529***	–0.0301**	–0.0244*
	(0.0178)	(0.0179)	(0.0131)	(0.0126)
Citing half-life × months out of labor force	0.0066**	0.0069***	0.0030	0.0041*
	(0.0026)	(0.0025)	(0.0021)	(0.0017)
Sample size	1,403	1,599	1,403	1,599

Source: Author's compilation.
*Significantly different from zero at the 0.10 level using a two-tailed test.
**Significantly different from zero at the 0.05 level using a two-tailed test.
***Significantly different from zero at the 0.01 level using a two-tailed test.

Table A.8 Determinants of Temporary and Permanent Exit from Science: Estimates from Hazard Analysis—University Data

	Temporary Exit		Permanent Exit	
	Men	Women	Men	Women
Half-life at time of graduation	–0.028 (0.118)	–0.001 (0.079)	—	—
Half-life at time of exit	—	—	–0.024 (0.084)	0.089 (0.058)
Increase in half-life	21.43** (9.78)	27.13*** (5.16)	4.91 (12.51)	25.51*** (5.72)
Decrease in half-life	13.04 (12.06)	11.45 (7.48)	24.97*** (7.51)	24.41*** (4.85)
Experience outside of science	–0.091** (0.045)	–0.010 (0.009)	0.003 (0.005)	–0.007 (0.005)
Ph.D. in science	–0.843*** (0.371)	–0.073 (0.281)	–1.669*** (0.533)	–1.372*** (0.389)
Master's in science	–0.326 (0.369)	–0.346 (0.254)	–0.599* (0.331)	–0.880*** (0.208)
Nonprofit employer	0.874** (0.410)	0.320 (0.287)	0.950*** (0.369)	0.433** (0.224)
Government employer	0.092 (0.354)	0.050 (0.240)	–0.676* (0.399)	–0.052 (0.193)
Full-time	–0.858 (0.854)	–0.880** (0.348)	–0.634 (0.693)	–0.120 (0.358)
Married	–0.777 (0.732)	–1.370*** (0.483)	–0.140 (0.486)	–1.105*** (0.409)
Children	–1.089** (0.504)	–0.365 (0.487)	–1.017*** (0.396)	–0.890** (0.423)
Months out of labor force for family	—	–0.020 (0.016)	—	0.005 (0.006)
Months out of labor force for other reasons	–0.004 (0.021)	0.004 (0.011)	–0.002 (0.018)	0.006 (0.012)
Percentage of childcare taken on	2.020 (1.296)	0.012 (0.817)	1.550 (1.008)	0.911* (0.510)
Percentage of chores taken on	0.939 (1.408)	2.395*** (0.670)	–0.317 (0.995)	2.347*** (0.528)
Log of likelihood function	–583.809	–583.847	–344.411	–855.613
Sample size	883	948	898	1,002

Source: Author's compilation.
***Coefficient is significantly different from zero at the 0.01 level using a two-tailed test.
**Coefficient is significantly different from zero at the 0.05 level using a two-tailed test.
*Coefficient is significantly different from zero at the 0.10 level using a two-tailed test.