

BIBLIOGRAPHY

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TABLE 1

University of California
Nine Campuses
Doctorate Recipients by Sex, Major Field, and Percent Change
1968, 1978, and 1988

							Percentage Change		
	1968	%	1978	%	1988	%	1968-78	1978-88	1968-88
MEN									
Arts& Humanities	99	9.0%	165	11.7%	149	10.4%	67%	-10%	51%
Engineering	145	13.3%	214	15.2%	341	23.8%	48%	59%	135%
Life Sciences	271	24.8%	361	25.7%	322	22.5%	33%	-11%	19%
Physical Sciences	309	28.2%	338	24.1%	356	24.9%	9%	5%	15%
Professional Sch.	128	11.7%	87	6.2%	82	5.7%	-32%	-6%	-36%
Social Sciences	142	13.0%	240	17.1%	180	12.6%	69%	-25%	27%
All Fields	1,094	100.0%	1,405	100.0%	1,430	100.0%	28%	2%	31%
WOMEN									
Arts& Humanities	32	19.3%	117	27.7%	146	22.4%	266%	25%	356%
Engineering	1	0.6%	5	1.2%	27	4.1%	400%	440%	2600%
Life Sciences	44	26.5%	115	27.2%	193	29.6%	161%	68%	339%
Physical Sciences	14	8.4%	35	8.3%	79	12.1%	150%	126%	464%
Professional Sch.	34	20.5%	66	15.6%	69	10.6%	94%	5%	103%
Social Sciences	41	24.7%	85	20.1%	139	21.3%	107%	64%	239%
All Fields	166	100.0%	423	100.0%	653	100.0%	155%	54%	293%
TOTAL*									
Arts& Humanities	152	10.5%	299	15.1%	323	14.1%	97%	8%	113%
Engineering	170	11.8%	249	12.6%	402	17.5%	46%	61%	136%
Life Sciences	348	24.1%	504	25.5%	568	24.7%	45%	13%	63%
Physical Sciences	377	26.1%	403	20.4%	488	21.3%	7%	21%	29%
Professional Sch.	182	12.6%	170	8.6%	167	7.3%	-7%	-2%	-8%
Social Sciences	215	14.9%	350	17.7%	347	15.1%	63%	-1%	61%
All Fields	1,444	100.0%	1,975	100.0%	2,295	100.0%	37%	16%	59%

* The TOTAL includes those for whom sex is unknown; therefore, the MEN and WOMEN numbers will not sum to the TOTAL.

Source: UC-NRC tapes, "table1", 10-18-90, JJ

Table 1a

University of California
 Nine Campuses
 NRC Doctorate Recipients by Sex
 1968, 1978, 1988
 (Percent by Sex)

	1968		1978		1988	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Men	1,094	87%	1,405	77%	1,430	69%
Women	166	13%	423	23%	653	31%
Total*	1,260	100%	1,828	100%	2,083	100%

* The total includes all doctoral recipients whose sex was known.

Source: NRC, "nrc/sex%ix", 7-19-90, mn

Table 1b

University of California
 Nine Campuses
 NRC Doctorate Recipients by Ethnicity
 1978 and 1988
 (Percent Change)

	1978	1988	Percent
	<u>N</u>	<u>N</u>	<u>Change</u>
Total Minority	190	274	44%
African American	33	40	21%
American Indian	1	9	--
Asian american	103	146	42%
Chicano/Latino	53	79	49%
Non-Asian Minority	87	128	47%
White	1,362	1,464	7%
Other	102	49	-52%
Total domestic	1,654	1,787	8%

N is taken from entry to Ph.D.

Source: NRC, "min%ds", 7-19-90, mn

TABLE 2

**University of California
Nine Campuses
Doctorate Recipients by Ethnicity (U.S. Citizens & Permanent Residents)
1978 & 1988
(Percentages by Field)**

1978	Asian		African American		American Indian		Chicano/Latino		White		Non-Asian Min. Total		Total Minority		Total Domestic	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Arts&Humanities	3	2.9%	3	9.1%	0	0.0%	17	32.1%	239	17.5%	20	23.0%	23	12.1%	278	16.8%
Engineering & CS	29	28.2%	1	3.0%	0	0.0%	4	7.5%	109	8.0%	5	5.7%	34	17.9%	149	9.0%
Life Sciences	31	30.1%	7	21.2%	1	100.0%	4	7.5%	376	27.6%	12	13.8%	43	22.6%	438	26.5%
Physical Sciences	25	24.3%	6	18.2%	0	0.0%	1	1.9%	287	21.1%	7	8.0%	32	16.8%	341	20.6%
Professional Sch.	8	7.8%	4	12.1%	0	0.0%	11	20.8%	107	7.9%	15	17.2%	23	12.1%	144	8.7%
Social Sciences	7	6.8%	12	36.4%	0	0.0%	16	30.2%	244	17.9%	28	32.2%	35	18.4%	304	18.4%
All Fields	103	100.0%	33	100.0%	1	100.0%	53	100.0%	1,362	100.0%	87	100.0%	190	100.0%	1,654	100.0%

1988	Asian		African American		American Indian		Chicano/Latino		White		Non-Asian Min. Total		Total Minority		Total Domestic	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Arts&Humanities	15	10.3%	7	17.5%	3	33.3%	17	21.5%	238	16.3%	27	21.1%	42	15.3%	287	16.1%
Engineering & CS	47	32.2%	1	2.5%	0	0.0%	5	6.3%	190	13.0%	6	4.7%	53	19.3%	252	14.1%
Life Sciences	34	23.3%	7	17.5%	1	11.1%	19	24.1%	410	28.0%	27	21.1%	61	22.3%	479	26.8%
Physical Sciences	28	19.2%	4	10.0%	3	33.3%	13	16.5%	298	20.4%	20	15.6%	48	17.5%	360	20.1%
Professional Sch	9	6.2%	9	22.5%	0	0.0%	8	10.1%	96	6.6%	17	13.3%	26	9.5%	124	6.9%
Social Sciences	13	8.9%	12	30.0%	2	22.2%	17	21.5%	232	15.8%	31	24.2%	44	16.1%	285	15.9%
All Fields	146	100.0%	40	100.0%	9	100.0%	79	100.0%	1,464	100.0%	128	100.0%	274	100.0%	1,787	100.0%

Note: Includes U.S. citizens and permanent residents only (excludes foreign); the Domestic Total includes those for whom ethnicity is unknown.

Source: UC-NRC tapes, "table2", 9-14-90, j1

TABLE 3

UNIVERSITY OF CALIFORNIA
NINE CAMPUSES
DOCTORATE RECIPIENTS
BY AVERAGE AGE AT DEGREE COMPLETION

		<u>TOTAL *</u>	<u>MEN *</u>	<u>WOMEN *</u>	<u>WHITE</u>	<u>ASIAN</u>	<u>AFRICAN AMERICAN</u>	<u>CHICANO/ LATINO</u>
ALL FIELDS								
	1988	33.3	32.6	34.6	33.3	32.5	37.3	34.1
	1978	32.1	31.6	33.8	32.0	31.8	35.1	35.2
	1968	32.3	31.9	34.3	N/A	N/A	N/A	N/A
ARTS & HUMANITIES								
	1988	36.5	36.1	37.0	36.2	34.3	38.9	38.8
	1978	34.0	33.3	35.1	33.8	31.0	37.0	35.9
	1968	34.0	33.6	35.2	N/A	N/A	N/A	N/A
ENGINEERING & CS								
	1988	31.3	31.3	31.4	31.1	31.7	(31.0)	31.8
	1978	31.6	31.6	31.8	33.0	30.8	(31.0)	31.8
	1968	31.6	31.6	31.0	N/A	N/A	N/A	N/A
LIFE SCIENCES								
	1988	32.4	32.0	32.9	32.3	32.3	34.7	31.8
	1978	30.9	30.7	31.7	30.5	32.3	35.9	32.5
	1968	31.0	31.1	30.5	N/A	N/A	N/A	N/A
PHYSICAL SCIENCES								
	1988	30.9	30.9	31.0	30.6	31.4	32.5	30.7
	1978	29.8	29.7	30.4	29.6	30.4	32.5	(28.0)
	1968	29.0	29.1	27.7	N/A	N/A	N/A	N/A
PROFESSIONS								
	1988	38.0	37.1	39.0	39.0	35.2	43.6	36.8
	1978	36.8	36.7	36.9	36.9	37.4	38.0	38.2
	1968	39.1	38.4	41.7	N/A	N/A	N/A	N/A
SOCIAL SCIENCES								
	1988	35.0	34.8	35.3	35.2	35.0	35.4	34.2
	1978	32.9	32.4	34.1	32.5	33.6	34.8	34.5
	1968	33.0	32.7	34.0	N/A	N/A	N/A	N/A

Note: Figures for American Indians are not displayed because only 1 American Indian received a Doctorate in 1978 and only 9 American Indians in total received Doctorates in 1988; the means in parentheses () are based on only 1 observation.

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Source: UC-NRC tapes, 'tabs3-5', 10-18-90, jl

TABLE 4

UNIVERSITY OF CALIFORNIA
NINE CAMPUSES
DOCTORATE RECIPIENTS BY MARITAL STATUS
(Percentage Married)

		<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>WHITE</u>	<u>ASIAN</u>	<u>AFRICAN AMERICAN</u>	<u>CHICANO/ LATINO</u>
ALL FIELDS								
	1988	56%	57%	53%	55%	60%	45%	57%
	1978	59%	61%	55%	59%	68%	67%	67%
	1968	76%	79%	58%	N/A	N/A	N/A	N/A
ARTS & HUMANITIES								
	1988	58%	59%	57%	58%	71%	17%	65%
	1978	59%	58%	60%	57%	100%	100%	69%
	1968	74%	81%	53%	N/A	N/A	N/A	N/A
ENGINEERING & CS								
	1988	61%	61%	61%	55%	75%	(100%)	80%
	1978	64%	64%	80%	69%	69%	(100%)	50%
	1968	82%	82%	100%	N/A	N/A	N/A	N/A
LIFE SCIENCES								
	1988	51%	53%	48%	53%	41%	57%	53%
	1978	60%	63%	49%	60%	69%	57%	25%
	1968	75%	78%	60%	N/A	N/A	N/A	N/A
PHYSICAL SCIENCES								
	1988	50%	50%	49%	50%	41%	75%	43%
	1978	52%	52%	50%	51%	52%	83%	(100%)
	1968	73%	74%	50%	N/A	N/A	N/A	N/A
PROFESSIONS								
	1988	70%	77%	61%	65%	100%	44%	63%
	1978	77%	84%	69%	79%	75%	75%	72%
	1968	80%	86%	60%	N/A	N/A	N/A	N/A
SOCIAL SCIENCES								
	1988	56%	60%	52%	57%	58%	36%	56%
	1978	56%	58%	49%	55%	100%	50%	75%
	1968	75%	80%	58%	N/A	N/A	N/A	N/A

Note: Figures for American Indians are not displayed because only 1 American Indian received a Doctorate in 1978 and only 9 American Indians in total received Doctorates in 1988; the figures in parentheses () are based on only 1 observation.

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Source: UC-NRC tapes, 'tabs3-5', 10-18-90, jl

TABLE 5

UNIVERSITY OF CALIFORNIA
NINE CAMPUSES
DOCTORATE RECIPIENTS
PERCENTAGE WITH ONE OR MORE DEPENDENTS

		<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>WHITE</u>	<u>ASIAN</u>	<u>AFRICAN AMERICAN</u>	<u>CHICANO/ LATINO</u>
ALL FIELDS								
	1988	41%	46%	29%	35%	43%	41%	60%
	1978	50%	55%	33%	48%	55%	67%	54%
	1968	72%	80%	19%	N/A	N/A	N/A	N/A
ARTS & HUMANITIES								
	1988	42%	50%	33%	39%	46%	40%	73%
	1978	42%	45%	37%	41%	0%	100%	31%
	1968	74%	86%	28%	N/A	N/A	N/A	N/A
ENGINEERING & CS								
	1988	48%	51%	14%	37%	51%	NODATA	50%
	1978	62%	64%	0%	63%	68%	(100%)	25%
	1968	85%	86%	0%	N/A	N/A	N/A	N/A
LIFE SCIENCES								
	1988	34%	41%	22%	31%	38%	33%	50%
	1978	49%	57%	22%	48%	53%	57%	33%
	1968	71%	79%	11%	N/A	N/A	N/A	N/A
PHYSICAL SCIENCES								
	1988	34%	37%	20%	27%	27%	67%	57%
	1978	42%	44%	24%	40%	38%	60%	(100%)
	1968	69%	71%	17%	N/A	N/A	N/A	N/A
PROFESSIONS								
	1988	67%	77%	54%	58%	88%	44%	100%
	1978	68%	83%	48%	69%	63%	100%	64%
	1968	76%	88%	23%	N/A	N/A	N/A	N/A
SOCIAL SCIENCES								
	1988	39%	46%	29%	37%	25%	36%	44%
	1978	51%	56%	36%	45%	71%	58%	85%
	1968	67%	80%	18%	N/A	N/A	N/A	N/A

Note: Figures for American Indians are not displayed because only 1 American Indian received a Doctorate in 1978 and only 9 American Indians in total received Doctorates in 1988; the figures in parentheses () are based on only 1 observation.

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Source: UC-NRC tapes, 'tabs3-5', 10-18-90, jl

TABLE 5A

UNIVERSITY OF CALIFORNIA
 Nine Campuses
 Doctorate Recipients
 Mean Time from Entry to Graduate School to Completion of Doctoral Degree

DEPENDENTS/NO DEPENDENTS
 1980-88

	<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>WHITE</u>	<u>ASIAN</u>	<u>AFRICAN AMER.</u>	<u>CHICANO/ LATINO</u>
ALL FIELDS							
1 or more Dependents	9.5	9.1	11.3	9.8	9.2	12.5	9.7
No Dependents	8.2	7.6	9.1	8.3	7.5	11.4	8.6
Difference	1.3	1.5	2.2	1.5	1.7	1.1	1.1
ARTS & HUMANITIES							
1 or more Dependents	11.3	11.0	12.1	11.3	12.7	11.2	10.9
No Dependents	10.6	10.0	11.0	10.6	12.4	10.8	11.5
Difference	0.7	1.0	1.1	0.7	0.3	0.4	-0.6
ENGINEERING & CS							
1 or more Dependents	8.4	8.4	9.9	9.5	8.3	9.3	8.6
No Dependents	6.8	6.7	7.6	7.1	6.7	7.2	7.2
Difference	1.6	1.7	2.3	2.4	1.6	2.1	1.4
LIFE SCIENCES							
1 or more Dependents	8.7	8.3	10.3	8.7	9.6	11.6	8.2
No Dependents	7.5	7.2	7.9	7.5	7.1	10.8	6.7
Difference	1.2	1.1	2.4	1.2	2.5	0.8	1.5
PHYSICAL SCIENCES							
1 or more Dependents	7.6	7.5	8.3	7.6	8.0	7.4	7.3
No Dependents	6.6	6.7	6.4	6.6	6.6	7.8	6.3
Difference	1.0	0.8	1.9	1.0	1.4	-0.4	1.0
PROFESSIONS							
1 or more Dependents	12.5	12.0	13.3	13.3	11.1	14.3	13.0
No Dependents	12.0	11.4	12.4	12.3	9.0	15.0	11.2
Difference	0.5	0.6	0.9	1.0	2.1	-0.7	1.8
SOCIAL SCIENCES							
1 or more Dependents	10.4	10.2	10.9	10.3	10.6	13.5	9.1
No Dependents	8.9	8.7	9.0	8.9	8.4	10.7	8.6
Difference	1.5	1.5	1.9	1.4	2.2	2.8	0.5

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Source: UC-NRC tapes, 'table5a', 11/29/90, jt

TABLE 5B

UNIVERSITY OF CALIFORNIA
Nine Campuses
Doctorate Recipients

DEPENDENTS/NO DEPENDENTS
1980-88

	<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>WHITE</u>	<u>ASIAN</u>	<u>AFRICAN AMER.</u>	<u>CHICANO/ LATINO</u>
ALL FIELDS							
1 or more Dependents	6,224	4,942	1,282	3,895	450	126	247
No Dependents	8,755	5,566	3,189	6,726	540	136	200
% with Dependents	42%	47%	29%	37%	45%	48%	55%
ARTS & HUMANITIES							
1 or more Dependents	824	532	292	608	27	24	67
No Dependents	1,192	535	657	1,000	36	21	46
% with Dependents	41%	50%	31%	38%	43%	53%	59%
ENGINEERING & CS							
1 or more Dependents	1,143	1,107	36	445	179	6	17
No Dependents	982	880	102	546	107	5	6
% with Dependents	54%	56%	26%	45%	63%	55%	74%
LIFE SCIENCES							
1 or more Dependents	1,481	1,173	308	1,028	76	16	41
No Dependents	2,397	1,419	978	1,936	173	24	46
% with Dependents	38%	45%	24%	35%	31%	40%	47%
PHYSICAL SCIENCES							
1 or more Dependents	1,080	996	84	678	90	7	30
No Dependents	2,134	1,726	408	1,624	142	12	32
% with Dependents	34%	37%	17%	29%	39%	37%	48%
PROFESSIONS							
1 or more Dependents	710	449	261	463	46	29	36
No Dependents	566	219	347	437	20	31	17
% with Dependents	56%	67%	43%	51%	70%	48%	68%
SOCIAL SCIENCES							
1 or more Dependents	986	685	301	673	32	44	56
No Dependents	1,484	787	697	1,183	62	43	53
% with Dependents	40%	47%	30%	36%	34%	51%	51%

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Source: UC-NRC tapes, 'table5b', 11/29/90, jt

TABLE 6

UNIVERSITY OF CALIFORNIA
NINE CAMPUSES
Doctorate Recipients by Parent Education Level by Sex, 1988
(U.S. Citizens & Permanent Residents)

	MOTHER			FATHER		
	Men	Women	Total	Men	Women	Total
ALL FIELDS						
No H.S. Diploma	9.7%	10.3%	9.9%	10.8%	12.0%	11.2%
H.S. Diploma	29.0%	26.3%	28.0%	19.3%	17.4%	18.6%
Some College	45.4%	45.0%	45.3%	34.7%	36.4%	35.3%
Master's Degree*	13.4%	16.2%	14.4%	21.4%	21.0%	21.3%
Doctoral**	2.5%	2.2%	2.4%	13.8%	13.2%	13.6%
ARTS & HUMANITIES						
No H.S. Diploma	11.8%	11.5%	11.6%	15.1%	11.6%	13.4%
H.S. Diploma	33.1%	20.9%	26.9%	19.4%	14.5%	17.0%
Some College	39.0%	44.5%	41.8%	30.9%	37.0%	33.9%
Master's Degree*	12.5%	20.9%	16.7%	22.3%	24.6%	23.5%
Doctoral**	3.7%	2.2%	2.9%	12.2%	12.3%	12.3%
ENGINEERING & CS						
No H.S. Diploma	13.9%	3.8%	12.8%	9.5%	11.5%	9.7%
H.S. Diploma	24.5%	42.3%	26.4%	18.1%	19.2%	18.2%
Some College	47.7%	30.8%	45.9%	35.7%	30.8%	35.2%
Master's Degree*	13.4%	19.2%	14.0%	24.9%	26.9%	25.1%
Doctoral**	0.5%	3.8%	0.8%	11.8%	11.5%	11.7%
LIFE SCIENCES						
No H.S. Diploma	6.4%	4.1%	5.5%	9.2%	9.4%	9.3%
H.S. Diploma	29.8%	27.5%	28.9%	18.4%	17.6%	18.1%
Some College	49.6%	50.3%	49.9%	37.1%	39.4%	38.0%
Master's Degree*	11.3%	14.6%	12.6%	21.2%	15.9%	19.2%
Doctoral**	2.8%	3.5%	3.1%	14.1%	17.6%	15.5%
PHYSICAL SCIENCES						
No H.S. Diploma	6.6%	7.4%	6.7%	11.2%	7.4%	10.4%
H.S. Diploma	29.2%	23.5%	28.1%	17.7%	14.7%	17.1%
Some College	44.2%	44.1%	44.2%	35.0%	29.4%	33.9%
Master's Degree*	16.1%	22.1%	17.3%	19.9%	32.4%	22.3%
Doctoral**	4.0%	2.9%	3.8%	16.2%	16.2%	16.2%
PROFESSIONS						
No H.S. Diploma	22.6%	23.4%	23.1%	17.0%	21.9%	19.7%
H.S. Diploma	39.6%	28.1%	33.3%	30.2%	21.9%	25.6%
Some College	34.0%	42.2%	38.5%	32.1%	42.2%	37.6%
Master's Degree*	3.8%	6.3%	5.1%	15.1%	9.4%	12.0%
Doctoral**	0.0%	0.0%	0.0%	5.7%	4.7%	5.1%
SOCIAL SCIENCES						
No H.S. Diploma	9.1%	13.6%	11.2%	9.7%	13.6%	11.5%
H.S. Diploma	25.9%	28.0%	26.9%	21.5%	19.2%	20.4%
Some College	46.2%	43.2%	44.8%	31.9%	33.6%	32.7%
Master's Degree*	16.8%	14.4%	15.7%	20.8%	22.4%	21.6%
Doctoral**	2.1%	0.8%	1.5%	15.0%	11.2%	13.8%

Source: UC-NRC tapes, 'table6,' 10/24/90, jt

*Includes MA, MD, JD, DDS, and other Professional degrees.

**Includes only Ph.D.

TABLE 6A

**UNIVERSITY OF CALIFORNIA
NINE CAMPUSES**

**Doctorate Recipients by Parent Education Level by Ethnicity, 1988
(U.S. Citizens & Permanent Residents)**

	MOTHER					FATHER				
	<u>Afr.</u> <u>Amer.</u>	<u>Asian</u>	<u>Chic/ Latino</u>	<u>White</u>	<u>Total*</u>	<u>Afr.</u> <u>Amer.</u>	<u>Asian</u>	<u>Chic/ Latino</u>	<u>White</u>	<u>Total*</u>
ALL FIELDS										
No H.S. Diploma	21%	26%	29%	7%	10%	28%	13%	30%	9%	11%
H.S. Diploma	37%	27%	31%	28%	28%	21%	20%	23%	18%	19%
Some College	24%	36%	25%	48%	45%	28%	38%	22%	36%	35%
Master's Degree**	18%	9%	15%	15%	14%	15%	18%	18%	22%	21%
Doctoral***	0%	2%	0%	3%	2%	8%	13%	8%	14%	14%
ARTS & HUMANITIES										
No H.S. Diploma	14%	29%	44%	7%	12%	29%	14%	47%	9%	13%
H.S. Diploma	71%	21%	25%	26%	27%	43%	7%	6%	17%	17%
Some College	14%	29%	6%	46%	42%	29%	50%	24%	35%	34%
Master's Degree**	0%	21%	25%	17%	17%	0%	14%	18%	25%	24%
Doctoral***	0%	0%	0%	4%	3%	0%	14%	6%	14%	12%
ENGINEERING & CS										
No H.S. Diploma	0%	28%	20%	8%	13%	100%	16%	20%	7%	10%
H.S. Diploma	100%	18%	40%	29%	26%	0%	16%	40%	19%	18%
Some College	0%	47%	40%	45%	46%	0%	40%	20%	33%	38%
Master's Degree**	0%	7%	0%	17%	14%	0%	18%	20%	28%	19%
Doctoral***	0%	2%	0%	1%	1%	0%	11%	0%	12%	15%
LIFE SCIENCES										
No H.S. Diploma	29%	22%	6%	4%	6%	29%	13%	12%	8%	9%
H.S. Diploma	43%	28%	41%	28%	29%	14%	19%	29%	17%	18%
Some College	29%	38%	29%	52%	50%	43%	34%	29%	39%	38%
Master's Degree**	0%	13%	24%	13%	13%	0%	19%	12%	20%	19%
Doctoral***	0%	0%	0%	4%	3%	14%	16%	18%	15%	15%
PHYSICAL SCIENCES										
No H.S. Diploma	0%	11%	15%	5%	7%	0%	7%	8%	10%	10%
H.S. Diploma	50%	44%	31%	26%	28%	25%	37%	33%	14%	17%
Some College	0%	33%	38%	46%	44%	50%	30%	8%	36%	34%
Master's Degree**	50%	7%	15%	18%	17%	0%	19%	33%	23%	22%
Doctoral***	0%	4%	0%	4%	4%	25%	7%	17%	18%	16%
PROFESSIONS										
No H.S. Diploma	38%	71%	38%	17%	23%	50%	14%	50%	15%	20%
H.S. Diploma	13%	14%	50%	34%	33%	13%	14%	13%	27%	26%
Some College	13%	14%	0%	47%	38%	0%	71%	25%	40%	38%
Master's Degree**	38%	0%	13%	2%	5%	38%	0%	13%	11%	12%
Doctoral***	0%	0%	0%	0%	0%	0%	0%	0%	7%	5%
SOCIAL SCIENCES										
No H.S. Diploma	18%	36%	50%	7%	11%	17%	18%	40%	9%	12%
H.S. Diploma	18%	36%	13%	27%	27%	17%	18%	27%	20%	20%
Some College	45%	18%	38%	47%	45%	33%	27%	20%	34%	33%
Master's Degree**	18%	0%	0%	18%	16%	25%	9%	13%	22%	22%
Doctoral***	0%	9%	0%	1%	1%	8%	27%	0%	15%	14%

Source: UC-NRC tapes, 'table6a', 10/24/90, jt

*Includes American Indian and those for whom ethnicity is unknown.

**Includes MA, MD, JD, DDS, and other professional Degrees.

***Includes only Ph.D.

TABLE 7

UNIVERSITY OF CALIFORNIA
NINE CAMPUSES
DOCTORAL RECIPIENTS
BY ETHNICITY (U.S. Citizens & Permanent Residents)
INSTITUTION WHERE BACHELORS EARNED

	1988					1978				
	ASIAN	AFRICAN AMER.	CHICANO/LATINO	WHITE	DOMESTIC TOTAL	ASIAN	AFRICAN AMER.	CHICANO/LATINO	WHITE	DOMESTIC TOTAL
ALL FIELDS										
UC	30%	15%	29%	33%	32%	34%	9%	45%	31%	31%
CSU	5%	30%	21%	11%	12%	7%	25%	19%	12%	12%
Other Cal	5%	10%	7%	6%	6%	3%	0%	13%	9%	9%
Other US	61%	45%	43%	50%	50%	56%	66%	23%	48%	48%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
ARTS & HUMANITIES										
UC	33%	0%	25%	32%	30%	0%	0%	47%	32%	32%
CSU	7%	57%	31%	10%	13%	33%	33%	18%	11%	13%
Other Cal	7%	14%	13%	8%	9%	0%	0%	18%	13%	12%
Other US	53%	29%	31%	51%	49%	67%	67%	18%	44%	43%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
ENGINEERING & CS										
UC	22%	N=1	20%	29%	28%	29%	N=1	50%	30%	30%
CSU	2%	0%	40%	6%	6%	4%	0%	0%	7%	6%
Other Cal	2%	0%	0%	4%	4%	0%	0%	0%	7%	6%
Other US	73%	0%	40%	61%	62%	68%	0%	50%	57%	59%
Total	100%	N=1	100%	100%	100%	100%	N=1	100%	100%	100%
LIFE SCIENCES										
UC	34%	29%	21%	35%	34%	40%	0%	0%	35%	34%
CSU	9%	0%	11%	12%	11%	7%	29%	50%	15%	15%
Other Cal	3%	14%	5%	5%	5%	0%	0%	0%	7%	7%
Other US	53%	57%	63%	48%	49%	53%	71%	50%	43%	44%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
PHYSICAL SCIENCES										
UC	39%	0%	31%	26%	27%	28%	0%	0%	25%	26%
CSU	4%	0%	23%	10%	10%	12%	0%	0%	7%	8%
Other Cal	11%	25%	8%	9%	9%	8%	0%	100%	9%	9%
Other US	46%	75%	38%	56%	54%	52%	100%	0%	59%	57%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
PROFESSIONAL SCHOOLS										
UC	11%	0%	57%	34%	31%	50%	0%	45%	29%	29%
CSU	0%	56%	29%	15%	19%	0%	25%	27%	14%	14%
Other Cal	0%	11%	14%	9%	8%	13%	0%	9%	9%	11%
Other US	89%	33%	0%	43%	42%	38%	75%	18%	48%	45%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
SOCIAL SCIENCES										
UC	31%	25%	33%	40%	39%	43%	17%	56%	31%	32%
CSU	8%	25%	13%	14%	14%	0%	33%	13%	15%	15%
Other Cal	8%	0%	0%	4%	4%	0%	0%	13%	9%	8%
Other US	54%	50%	53%	42%	43%	57%	50%	19%	44%	45%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: Includes U.S. citizens and permanent residents only (excludes foreign); the Domestic Total includes American Indians and those for whom ethnicity is unknown; figures for American Indians are not displayed because only 1 American Indian received a Doctorate in 1978 and only 9 American Indians in total received Doctorates in 1988.

TABLE 8

University of California
Nine Campuses
Mean Time to Doctoral Degree
All Degree Recipients*

All Fields	<u>1968</u>	<u>1978</u>	<u>1988</u>
BA-PhD	9.1	9.1	10.0
Pre-Grad	1.1	1.0	1.2
Entry-PhD	8.0	8.1	8.9
MA Time	1.6	1.6	1.7
MA-PhD	6.4	6.5	7.2
Registered	5.9	6.5	7.4
Withdrawn	2.1	1.6	1.5

* Includes graduate study time at institutions other than UC.

Source: UC-NRC tapes, "TABLE8", 10-18-90, JL

TABLE 8A

University of California
Nine Campuses
Median Time to Doctoral Degree
All Degree Recipients*

All Fields	<u>1968</u>	<u>1978</u>	<u>1988</u>
BA-PhD	7.3	8.1	8.7
Pre-Grad	0.8	0.8	1.0
Entry-PhD	6.5	7.3	7.8
MA Time	1.4	1.6	1.6
MA-PhD	5.1	5.7	6.2
Registered	5.4	6.1	6.9
Withdrawn	1.0	1.2	0.9

* Includes graduate study time at insitutions other than UC.

Source: UC-NRC tapes, "TABLE8A", 10-18-90, jl

TABLE 9

UNIVERSITY OF CALIFORNIA
Nine Campuses
TIME TO DEGREE, DOCTORATE RECIPIENTS 1980-1988
TIME FROM GRADUATE ENTRY TO COMPLETION OF DOCTORAL DEGREE
BY SEX, CITIZENSHIP STATUS, AND ETHNICITY

U.S. Citizens & Permanent Residents Only										
	TOTAL*	MEN*	WOMEN*	FOREIGN ONLY	ASIANS	WHITES	TOTAL NON-ASIAN MINORITIES	AFRICAN AMERICANS	AMERICAN INDIANS	CHICANOS/LATINOS
ALL FIELDS										
Mean	8.7	8.3	9.8	7.8	8.0	8.8	9.7	11.9	10.6	9.3
Median	7.6	7.3	8.5	7.1	7.3	7.6	9.2	10.5	10.6	8.5
Number	16,770	11,669	5,101	2,702	1,109	11,691	848	300	43	505
ARTS & HUMANITIES										
Mean	10.8	10.4	11.3	10.0	12.0	10.7	11.2	10.7	11.0	11.3
Median	9.9	9.5	10.3	9.5	12.3	9.9	10.2	10.1	10.0	10.4
Number	2,383	1,247	1,136	197	73	1,863	192	51	8	133
ENGINEERING & CS										
Mean	7.6	7.6	8.0	7.0	7.3	7.9	7.7	8.1	6.0	8.3
Median	6.7	6.7	7.2	6.3	7.0	6.9	7.5	8.6	6.0	8.0
Number	2,352	2,192	160	869	324	1,071	40	13	2	25
LIFE SCIENCES										
Mean	7.9	7.7	8.5	8.2	8.0	7.9	8.3	10.9	9.4	7.3
Median	7.0	6.9	7.2	7.5	7.0	6.9	7.3	9.0	10.8	6.6
Number	4,314	2,877	1,437	539	273	3,227	158	47	11	100
PHYSICAL SCIENCES										
Mean	6.9	7.0	6.8	7.0	7.1	6.9	7.2	7.7	7.7	6.8
Median	6.2	6.3	6.1	6.3	6.5	6.2	6.5	7.3	6.2	6.4
Number	3,519	2,978	541	585	257	2,480	93	20	9	64
PROFESSIONAL SCHOOLS										
Mean	12.3	11.7	13.0	9.5	10.0	12.6	13.0	15.2	15.8	12.3
Median	11.2	10.7	11.6	8.6	9.7	11.7	12.8	13.3	15.0	11.8
Number	1,425	728	697	200	72	990	133	71	5	57
SOCIAL SCIENCES										
Mean	9.5	9.4	9.6	8.8	9.4	9.4	10.1	11.9	13.1	8.9
Median	8.5	8.4	8.6	8.0	8.5	8.4	9.2	10.7	13.0	8.5
Number	2,777	1,647	1,130	312	110	2,060	232	98	8	126

Note: Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown; the numbers given in this table are the numbers that were used to calculate the means and medians.

Source: UC-NRC tapes, "table9", 10-18-90, jl

TABLE 10

University of California
NINE CAMPUSES
Mean Time to Degree
Doctorate Recipients, 1980-1988
By Masters Degree Status

	NO MASTERS			MASTERS OTHER INSTITUTION			MASTERS SAME CAMPUS		
	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>
Arts & Humanities	10.6	9.0	8.1	14.6	13.0	9.6	11.6	10.5	8.7
Engineering & CS	7.6	6.4	6.1	10.6	9.7	7.4	8.3	7.1	6.4
Life Sciences	7.9	7.0	6.6	11.6	10.5	8.2	10.2	8.7	7.2
Physical Sciences	7.1	6.5	6.2	10.4	9.7	8.1	8.2	7.5	6.9
Professional Schools	12.1	9.9	7.8	15.5	13.7	8.9	13.7	11.5	8.6
Social Sciences	9.6	8.4	7.5	13.1	11.9	9.0	10.2	9.2	7.8
ALL FIELDS	8.0	7.5	6.6	12.6	11.4	8.5	10.0	8.9	7.5

Source: UC-NRC tapes, 'table10', 10-18-9, II

TABLE 10A

University of California
NINE CAMPUSES
Median Time to Degree
Doctorate Recipients, 1980-1988
By Masters Degree Status

	NO MASTERS			MASTERS OTHER INSTITUTION			MASTERS SAME CAMPUS		
	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>	<u>BA-PHD</u>	<u>GRAD-PHD</u>	<u>REG-PHD</u>
Arts & Humanities	9.2	7.9	7.3	12.8	11.6	8.6	10.2	9.2	7.9
Engineering & CS	6.2	5.5	5.2	9.3	8.3	6.5	6.9	5.9	5.5
Life Sciences	6.6	6.0	5.8	10.3	9.1	7.4	8.7	7.3	6.4
Physical Sciences	6.0	5.5	5.4	9.1	8.4	7.2	7.0	6.5	6.2
Professional Schools	10.1	7.2	6.5	13.9	12.1	8.0	11.8	9.8	7.7
Social Sciences	8.1	7.1	6.6	11.5	10.3	8.0	8.8	7.8	6.9
ALL FIELDS	6.6	6.0	5.7	10.9	9.8	7.6	8.4	7.4	6.6

Source: UC-NRC tapes, 'TABLE10A', 10-19-90.JI

TABLE 10B

University of California
NINE CAMPUSES
Doctorate Recipients, 1968, 1978, and 1988
Proportion of Doctoral Recipients by Masters Degree Status

	NO MASTERS			MASTERS OTHER INSTITUTION			MASTERS SAME CAMPUS		
	<u>1968</u>	<u>1978</u>	<u>1988</u>	<u>1968</u>	<u>1978</u>	<u>1988</u>	<u>1968</u>	<u>1978</u>	<u>1988</u>
Arts & Humanities	10%	14%	11%	40%	32%	39%	50%	54%	50%
Engineering & CS	10%	12%	14%	44%	41%	40%	47%	47%	46%
Life Sciences	44%	48%	50%	38%	29%	31%	18%	24%	19%
Physical Sciences	46%	46%	50%	24%	19%	21%	30%	35%	29%
Professional Schools	6%	7%	9%	64%	65%	62%	31%	27%	29%
Social Sciences	29%	23%	20%	35%	27%	36%	36%	50%	44%
ALL FIELDS	30%	30%	30%	38%	31%	35%	32%	38%	35%

Note: Ns are taken from the counts of GRAD-PHD (Time from entry in any graduate program to Ph.D.)

Source: UC-NRC tapes, 'TABLE10B', 10-19-90.jl

TABLE 11

University of California
 Nine Campuses
 Mean Time to Degree at
*DOCTORATE GRANTING INSTITUTION**
 1968, 1978, 1988

Time from Entry to Graduate School to Completion of Doctoral Degree
 By Major Field and Sex

Mean Time				Years Difference
	1968	1978	1988	1968-1988
MEN				
Arts & Humanities	8.3 (62)	9.4 (108)	10.2 (87)	1.9
Engineering & CS	6.3 (81)	6.7 (125)	6.3 (203)	0.0
Life Sciences	5.9 (162)	6.3 (252)	6.9 (225)	1.0
Physical Sciences	5.4 (233)	6.3 (275)	6.7 (281)	1.3
Professional Sch.	10.7 (46)	8.5 (35)	10.1 (35)	-0.6
Social Sciences	6.9 (88)	7.6 (170)	8.9 (112)	2.0
All Fields	6.5 (672)	7.0 (965)	7.4 (943)	0.9
WOMEN				
Arts & Humanities	7.9 (17)	8.9 (84)	10.5 (92)	2.6
Engineering & CS	9.0 (1)	8.5 (4)	6.7 (18)	—
Life Sciences	6.8 (33)	6.6 (88)	7.5 (130)	0.7
Physical Sciences	5.4 (11)	6.8 (27)	6.4 (63)	1.0
Professional Sch.	13.3 (13)	10.4 (18)	11.0 (23)	-2.3
Social Sciences	7.6 (31)	8.4 (68)	8.6 (93)	1.0
All Fields	7.9 (106)	8.0 (289)	8.4 (419)	0.5
TOTAL				
Arts & Humanities	8.2 (79)	9.2 (192)	10.3 (179)	2.1
Engineering & CS	6.4 (82)	6.8 (129)	6.3 (221)	-0.1
Life Sciences	6.0 (195)	6.4 (340)	7.1 (355)	1.1
Physical Sciences	5.4 (244)	6.3 (302)	6.6 (344)	1.2
Professional Sch.	11.3 (59)	9.2 (53)	10.4 (58)	-0.9
Social Sciences	7.1 (119)	7.8 (238)	8.8 (205)	1.7
All Fields	6.7 (778)	7.2 (1,254)	7.7 (1,362)	1.0

*Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

TABLE 11A

University of California
 Nine Campuses
 Median Time to Degree at
*DOCTORATE GRANTING INSTITUTION**
 1968, 1978, 1988

Time from Entry to Graduate School to Completion of Doctoral Degree
 By Major Field and Sex

Median Time				Years
				Difference
MEN	1968	1978	1988	1968-1988
Arts & Humanities	7.50 (62)	8.96 (108)	9.36 (87)	1.9
Engineering & CS	5.61 (81)	6.10 (125)	5.80 (203)	0.2
Life Sciences	5.13 (162)	5.64 (252)	6.22 (225)	1.1
Physical Sciences	4.89 (233)	5.78 (275)	6.03 (281)	1.1
Professional Sch.	7.83 (46)	7.88 (35)	8.50 (35)	0.7
Social Sciences	6.07 (88)	7.00 (170)	8.17 (112)	2.1
All Fields	5.36 (672)	6.26 (965)	6.42 (943)	1.1

				Years
				Difference
WOMEN	1968	1978	1988	1968-1988
Arts & Humanities	7.25 (17)	8.29 (84)	9.10 (92)	1.9
Engineering & CS	9.00 (1)	5.50 (4)	6.25 (18)	--
Life Sciences	5.58 (33)	5.82 (88)	6.70 (130)	1.1
Physical Sciences	5.25 (11)	6.13 (27)	5.83 (63)	0.6
Professional Sch.	15.75 (13)	9.00 (18)	9.75 (23)	-6.0
Social Sciences	6.31 (31)	7.64 (68)	7.73 (93)	1.4
All Fields	6.20 (106)	7.24 (289)	7.21 (419)	1.0

				Years
				Difference
TOTAL	1968	1978	1988	1968-1988
Arts & Humanities	7.46 (79)	8.63 (192)	9.24 (179)	1.8
Engineering & CS	5.64 (82)	6.10 (129)	5.85 (221)	0.2
Life Sciences	5.18 (195)	5.69 (340)	6.40 (355)	1.2
Physical Sciences	4.90 (244)	5.81 (302)	5.98 (344)	1.1
Professional Sch.	8.33 (59)	8.31 (53)	9.50 (58)	1.2
Social Sciences	6.16 (119)	7.23 (238)	7.96 (205)	1.8
All Fields	5.45 (778)	6.45 (1,254)	6.70 (1,362)	1.3

*Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

TABLE 12

University of California
 Nine Campuses
 Mean Time to Doctoral Degree at
*DOCTORATE GRANTING INSTITUTION**
 By Three Time Measures and by Major Field

	<u>1968</u>	<u>1978</u>	<u>1988</u>
ALL FIELDS			
BA-PhD	7.8	8.2	8.8
Pre-Grad	1.2	0.9	1.1
Entry-PhD	6.7	7.2	7.7
Registered	5.4	6.1	6.8
Withdrawn	1.2	1.1	0.9
ARTS & HUMANITIES			
BA-PhD	10.2	10.3	11.8
Pre-Grad	2.0	1.1	1.5
Entry-PhD	8.2	9.2	10.3
Registered	6.2	7.4	8.7
Withdrawn	2.0	1.8	1.7
ENGINEERING & CS			
BA-PhD	7.7	8.1	7.5
Pre-Grad	1.4	1.3	1.2
Entry-PhD	6.4	6.8	6.3
Registered	5.3	5.8	5.8
Withdrawn	1.1	1.0	0.6
LIFE SCIENCES			
BA-PhD	7.1	7.2	8.1
Pre-Grad	1.1	0.9	1.1
Entry-PhD	6.0	6.4	7.1
Registered	5.2	5.7	6.3
Withdrawn	0.8	0.7	0.8
PHYSICAL SCIENCES			
BA-PhD	6.0	6.8	7.3
Pre-Grad	0.6	0.4	0.7
Entry-PhD	5.4	6.3	6.6
Registered	5.0	5.7	6.3
Withdrawn	0.4	0.6	0.3
PROFESSIONS			
BA-PhD	13.0	11.2	12.9
Pre-Grad	1.7	2.0	2.5
Entry-PhD	11.3	9.2	10.4
Registered	6.5	6.8	8.0
Withdrawn	4.9	2.4	2.4
SOCIAL SCIENCES			
BA-PhD	8.3	8.9	10.0
Pre-Grad	1.2	1.1	1.2
Entry-PhD	7.1	7.8	8.8
Registered	5.5	6.5	7.4
Withdrawn	1.6	1.3	1.4

* Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

Source: UC-NRC tapes, 'TABLE12', 10-19-90, JL

TABLE 12A

University of California
 Nine Campuses
 Median Time to Doctoral Degree at
DOCTORATE GRANTING INSTITUTION*
 By Three Time Measures and by Major Field

	<u>1968</u>	<u>1978</u>	<u>1988</u>
ALL FIELDS			
BA-PhD	6.2	7.3	7.6
Pre-Grad	0.8	0.8	0.9
Entry-PhD	5.5	6.5	6.7
Registered	5.0	5.7	6.3
Withdrawn	0.4	0.7	0.4
ARTS & HUMANITIES			
BA-PhD	8.9	9.4	10.4
Pre-Grad	1.4	0.8	1.2
Entry-PhD	7.5	8.6	9.2
Registered	6.1	7.1	8.1
Withdrawn	1.4	1.5	1.1
ENGINEERING & CS			
BA-PhD	6.3	7.2	6.7
Pre-Grad	0.7	1.1	0.8
Entry-PhD	5.6	6.1	5.9
Registered	5.0	5.4	5.6
Withdrawn	0.7	0.7	0.3
LIFE SCIENCES			
BA-PhD	6.0	6.2	7.3
Pre-Grad	0.8	0.5	0.9
Entry-PhD	5.2	5.7	6.4
Registered	5.0	5.4	6.1
Withdrawn	0.2	0.3	0.3
PHYSICAL SCIENCES			
BA-PhD	5.3	6.3	6.5
Pre-Grad	0.4	0.5	0.5
Entry-PhD	4.9	5.8	6.0
Registered	4.8	5.3	5.8
Withdrawn	0.1	0.5	0.2
PROFESSIONS			
BA-PhD	11.7	10.4	13.2
Pre-Grad	3.4	2.1	3.7
Entry-PhD	8.3	8.3	9.5
Registered	5.7	6.3	7.4
Withdrawn	2.6	2.0	2.1
SOCIAL SCIENCES			
BA-PhD	6.9	8.0	8.8
Pre-Grad	0.7	0.7	0.8
Entry-PhD	6.2	7.2	8.0
Registered	5.3	6.2	7.4
Withdrawn	0.9	1.0	0.6

* Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

Source: UC-NRC tapes, 'TABLE12A', 10-19-90, jl

TABLE12B

University of California
Nine Campuses
Mean Time to Doctoral Degree at
*Doctorate Granting Institution**
By Three Time Measures, by Sex, and by Major Field

MEN				WOMEN			
	1968	1978	1988		1968	1978	1988
ALL FIELDS				ALL FIELDS			
BA-PhD	7.5	7.8	8.3	BA-PhD	10.0	9.5	9.8
Pre-Grad	1.0	0.8	0.9	Pre-Grad	2.1	1.5	1.4
Entry-PhD	6.5	7.0	7.4	Entry-PhD	7.9	8.0	8.4
Registered	5.4	6.1	6.7	Registered	5.6	6.5	7.2
Withdrawn	1.1	0.9	0.7	Withdrawn	2.3	1.5	1.2
ARTS & HUMANITIES				ARTS & HUMANITIES			
BA-PhD	9.5	9.7	11.2	BA-PhD	12.9	10.9	12.3
Pre-Grad	1.2	0.3	1.1	Pre-Grad	5.0	1.9	1.8
Entry-PhD	8.3	9.4	10.1	Entry-PhD	7.9	9.0	10.5
Registered	6.3	7.4	8.7	Registered	6.1	7.3	8.4
Withdrawn	2.0	2.0	1.4	Withdrawn	1.8	1.7	2.1
ENGINEERING & CS				ENGINEERING & CS			
BA-PhD	7.7	8.1	7.5	BA-PhD	9.0	9.5	8.4
Pre-Grad	1.4	1.4	1.2	Pre-Grad	0.0	1.0	1.7
Entry-PhD	6.3	6.7	6.3	Entry-PhD	9.0	8.5	6.7
Registered	5.3	5.8	5.9	Registered	8.0	6.8	6.2
Withdrawn	1.0	0.9	0.4	Withdrawn	1.0	1.7	0.5
LIFE SCIENCES				LIFE SCIENCES			
BA-PhD	7.0	6.9	7.8	BA-PhD	8.0	8.0	8.7
Pre-Grad	1.1	0.6	0.9	Pre-Grad	1.2	1.4	1.2
Entry-PhD	5.9	6.3	6.9	Entry-PhD	6.8	6.6	7.5
Registered	5.3	5.6	6.3	Registered	5.2	6.0	6.7
Withdrawn	0.6	0.7	0.6	Withdrawn	1.6	0.6	0.8
PHYSICAL SCIENCES				PHYSICAL SCIENCES			
BA-PhD	6.0	6.7	7.2	BA-PhD	5.8	7.2	7.5
Pre-Grad	0.6	0.4	0.5	Pre-Grad	0.5	0.4	1.1
Entry-PhD	5.4	6.3	6.7	Entry-PhD	5.3	6.8	6.4
Registered	5.0	5.7	6.3	Registered	4.9	5.7	6.1
Withdrawn	0.4	0.6	0.4	Withdrawn	0.4	1.1	0.3
PROFESSIONS				PROFESSIONS			
BA-PhD	11.7	10.5	12.6	BA-PhD	17.5	12.2	13.4
Pre-Grad	1.0	2.0	2.5	Pre-Grad	4.2	1.8	2.4
Entry-PhD	10.7	8.5	10.1	Entry-PhD	13.3	10.4	11.0
Registered	6.6	6.6	7.7	Registered	5.8	7.1	9.0
Withdrawn	4.1	1.9	2.4	Withdrawn	7.5	3.3	2.0
SOCIAL SCIENCES				SOCIAL SCIENCES			
BA-PhD	8.1	8.6	10.1	BA-PhD	8.7	9.6	10.0
Pre-Grad	1.2	1.0	1.2	Pre-Grad	1.1	1.2	1.4
Entry-PhD	6.9	7.6	8.9	Entry-PhD	7.6	8.4	8.6
Registered	5.4	6.4	7.7	Registered	5.7	6.5	7.3
Withdrawn	1.5	1.2	1.2	Withdrawn	1.9	1.9	1.3

*Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

Source: UC-NRC tapes, 'TABLE12B,' 10/24/90, jt

TABLE 13

University of California
Nine Campuses
Mean Time to Degree at
*DOCTORATE GRANTING INSTITUTION**
1978 and 1988

Time from Entry to Graduate School to Completion of Doctoral Degree
By Major Field and Ethnicity/Race

	Mean Time				Years Difference 1978-1988
	1978		1988		
ASIAN					
Arts and Humanities	7.7	(3)	10.0	(9)	2.3
Engineering	6.9	(17)	6.5	(22)	-0.4
Life Sciences	6.6	(19)	7.2	(22)	0.6
Physical Sciences	5.7	(15)	6.8	(19)	1.1
Professional Sch.	12.0	(1)	10.0	(3)	--
Social Sciences	10.6	(5)	8.0	(7)	-2.6
All Fields	6.9	(60)	7.4	(82)	0.5
NON-ASIAN MINORITY					
Arts and Humanities	9.5	(13)	9.5	(13)	0.0
Engineering	6.5	(4)	7.7	(4)	1.2
Life Sciences	5.7	(9)	7.6	(14)	1.9
Physical Sciences	6.3	(4)	7.1	(13)	0.8
Professional Sch.	8.5	(4)	10.3	(6)	1.8
Social Sciences	7.2	(19)	8.2	(18)	1.0
All Fields	7.5	(53)	8.3	(68)	0.8
WHITE					
Arts and Humanities	9.2	(163)	10.4	(140)	1.2
Engineering	7.8	(65)	6.9	(124)	-0.9
Life Sciences	6.4	(268)	7.2	(287)	0.8
Physical Sciences	6.4	(236)	6.7	(239)	0.3
Professional Sch.	9.9	(32)	11.4	(38)	1.5
Social Sciences	8.0	(182)	9.2	(153)	1.2
All Fields	7.4	(946)	8.0	(981)	0.6

* Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

Source: UC-NRC tapes, 'TABLE13' 10-19-90, jl

TABLE 13A

University of California
 Nine Campuses
 Median Time to Degree at
*DOCTORATE GRANTING INSTITUTION**
 1978 and 1988

Time from Entry to Graduate School to Completion of Doctoral Degree
 By Major Field and Ethnicity/Race

	Median Time				Years
	1978		1988		Difference 1978-1988
ASIAN					
Arts and Humanities	11.00	(3)	10.00	(9)	-1.0
Engineering	6.88	(17)	6.83	(22)	0.0
Life Sciences	6.00	(19)	7.50	(22)	1.5
Physical Sciences	5.13	(15)	6.00	(19)	0.9
Professional Sch.	12.00	(1)	10.00	(3)	--
Social Sciences	12.00	(5)	7.75	(7)	-4.3
All Fields	6.29	(60)	7.00	(82)	0.7
NON-ASIAN MINORITY					
Arts and Humanities	8.25	(13)	8.38	(13)	0.1
Engineering	5.50	(4)	8.00	(4)	2.5
Life Sciences	6.00	(9)	6.25	(14)	0.3
Physical Sciences	6.00	(4)	6.20	(13)	0.2
Professional Sch.	7.00	(4)	10.00	(6)	3.0
Social Sciences	7.40	(19)	8.17	(18)	0.8
All Fields	7.05	(53)	7.60	(68)	0.6
WHITE					
Arts and Humanities	8.71	(163)	9.18	(140)	0.5
Engineering	7.08	(65)	6.35	(124)	-0.7
Life Sciences	5.67	(268)	6.42	(287)	0.8
Physical Sciences	5.95	(236)	6.03	(239)	0.1
Professional Sch.	9.50	(32)	10.00	(38)	0.5
Social Sciences	7.27	(182)	8.46	(153)	1.2
All Fields	6.59	(946)	6.93	(981)	0.3

* Time to degree was calculated for only those doctorate recipients who received a masters degree at the same campus at which they earned their doctorate and for those who received no masters degree.

Source: UC-NRC tapes, "TABLE13A", 10-19-90, jl

TABLE 14

UNIVERSITY OF CALIFORNIA
Nine Campuses
MEAN TIME FROM GRADUATE ENTRY TO PHD
Doctorates Awarded 1980-1988
By Major Field, Type of Support, Sex, and Ethnicity/Race

	<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>ASIANS</u>	<u>WHITES</u>	<u>TOTAL NON-ASIAN MINORITIES</u>	<u>AFRICAN AMERICANS</u>	<u>CHICANOS/ LATINOS</u>	<u>FOREIGN</u>
ALL DISCIPLINES									
Fellowship	7.9	7.7	8.2	7.8	7.7	9.1	10.5	8.0	8.3
Loans	9.4	9.2	9.8	11.8	9.4	10.1	8.9	11.8	8.4
Other/Own	11.0	10.3	12.1	10.4	11.4	13.0	15.5	11.5	8.6
Own	12.0	11.6	12.7	10.6	12.1	13.8	18.4	11.9	9.8
Spouse	10.5	9.1	11.8	11.4	10.4	11.3	12.8	10.3	10.4
Family	8.7	8.2	9.7	8.8	9.4	9.0	—	11.0	7.6
Other	8.6	8.5	9.6	8.5	10.4	9.7	9.0	10.0	8.4
RA	7.0	6.9	7.3	7.3	7.0	6.9	8.3	6.7	6.8
TA	8.3	8.0	8.9	8.0	8.5	8.9	8.9	8.8	7.7
ARTS & HUMANITIES									
Fellowship	9.9	9.8	10.0	12.1	9.9	9.7	9.9	9.9	9.5
Loans	10.9	10.4	11.4	13.5	10.4	14.7	12.0	20.0	10.0
Other/Own	12.1	11.6	12.5	16.4	12.0	12.5	12.1	12.2	11.4
RA	9.7	9.3	10.1	9.8	9.8	9.0	--	9.0	9.8
TA	9.8	9.5	10.2	10.5	9.9	10.2	9.9	10.4	9.4
ENGINEERING & CS									
Fellowship	7.9	7.9	7.6	8.4	7.8	7.7	6.0	8.3	8.0
Loans	8.7	8.7	9.0	6.0	9.4	--	--	--	8.3
Other/Own	9.3	9.2	10.1	8.9	10.7	11.1	10.7	11.4	7.4
RA	6.7	6.6	7.0	6.9	6.8	6.5	8.5	5.7	6.4
TA	7.2	7.2	5.7	8.2	7.4	5.0	--	3.0	6.8
LIFE SCIENCES									
Fellowship	7.4	7.2	7.6	7.3	7.2	8.2	10.9	6.9	8.7
Loans	7.4	7.7	6.8	6.0	7.6	6.0	6.0	--	--
Other/Own	9.9	9.1	11.2	9.3	10.2	12.5	17.5	9.6	8.6
RA	7.3	7.2	7.3	8.0	7.2	6.8	7.4	6.9	7.3
TA	7.6	7.4	8.0	7.3	7.6	7.9	8.8	7.1	8.0
PHYSICAL SCIENCES									
Fellowship	6.5	6.4	6.6	6.8	6.4	7.2	9.0	6.5	6.4
Loans	7.8	8.3	6.0	--	7.8	--	--	--	--
Other/Own	9.0	9.0	9.2	10.1	9.3	8.0	7.0	8.0	7.8
RA	6.5	6.6	6.2	7.0	6.4	6.8	8.0	6.4	6.7
TA	6.8	6.8	6.7	6.8	6.8	6.9	7.3	6.4	6.8
PROFESSIONAL SCHOOLS									
Fellowship	10.3	10.1	10.5	9.8	10.8	10.4	10.6	10.0	9.7
Loans	10.3	9.7	11.2	--	10.6	7.0	4.0	10.0	--
Other/Own	13.3	12.8	13.9	11.1	13.7	15.3	17.2	13.3	9.9
RA	9.7	9.5	10.0	10.4	9.9	6.0	--	6.0	8.8
TA	9.3	9.3	9.2	8.8	9.7	9.0	9.0	--	8.1
SOCIAL SCIENCES									
Fellowship	8.7	8.6	9.0	8.0	8.5	9.6	10.9	8.2	8.9
Loans	9.2	9.3	9.2	16.0	9.0	9.5	9.3	9.7	8.0
Other/Own	10.8	10.6	10.9	10.7	10.8	11.9	14.8	9.6	9.0
RA	8.1	8.0	8.2	8.0	8.0	9.5	10.7	8.3	8.2
TA	8.4	8.5	8.2	7.9	8.4	8.7	9.4	7.7	8.3

* Total, Men, and Women include foreign and domestic, and also include those for whom ethnicity/race is unknown.

Note: American Indians are included in the TOTAL NON-ASIAN MINORITIES and in the TOTAL, MEN, and WOMEN figures.

Source: UC-NRC tapes, 'TABLE14', 10-19-90, jl

TABLE 14A

UNIVERSITY OF CALIFORNIA
Nine Campuses
DISTRIBUTION OF PRIMARY SUPPORT
Doctorates Awarded 1980-1988
By Major Field, Type of Support, Sex, and Ethnicity/Race

	<u>TOTAL*</u>	<u>MEN*</u>	<u>WOMEN*</u>	<u>ASIANS</u>	<u>WHITES</u>	<u>TOTAL NON-ASIAN MINORITIES</u>	<u>AFRICAN AMERICANS</u>	<u>CHICANOS/ LATINOS</u>	<u>FOREIGN</u>
ALL DISCIPLINES									
Fellowship	22%	21%	22%	23%	21%	33%	38%	32%	19%
Loans	1%	1%	1%	1%	1%	2%	3%	1%	1%
Other/Own	30%	27%	38%	20%	31%	36%	38%	34%	31%
Own	17%	16%	21%	12%	19%	27%	31%	25%	8%
Spouse	8%	5%	13%	5%	9%	7%	8%	7%	1%
Family	2%	2%	2%	3%	2%	1%	<1%	<1%	8%
Other	3%	4%	2%	0%	1%	1%	1%	2%	18%
RA	28%	32%	17%	41%	26%	13%	7%	15%	32%
TA	19%	18%	21%	15%	20%	16%	13%	18%	17%
ARTS & HUMANITIES									
Fellowship	12%	15%	10%	16%	10%	23%	41%	18%	23%
Loans	2%	1%	2%	4%	2%	2%	5%	1%	1%
Other/Own	38%	36%	42%	31%	39%	40%	31%	43%	29%
RA	2%	2%	2%	11%	2%	1%	0%	1%	2%
TA	45%	46%	44%	38%	47%	34%	23%	38%	45%
ENGINEERING & CS									
Fellowship	18%	18%	24%	12%	22%	28%	30%	30%	15%
Loans	1%	1%	1%	0%	1%	0%	0%	0%	1%
Other/Own	26%	26%	29%	23%	28%	36%	30%	39%	25%
RA	49%	50%	43%	59%	45%	31%	40%	26%	52%
TA	6%	6%	2%	7%	5%	5%	0%	4%	7%
LIFE SCIENCES									
Fellowship	37%	36%	38%	45%	37%	43%	46%	44%	24%
Loans	1%	1%	1%	0%	1%	1%	3%	0%	--
Other/Own	22%	21%	25%	15%	20%	17%	21%	13%	41%
RA	29%	31%	25%	29%	29%	30%	21%	35%	28%
TA	11%	11%	11%	11%	12%	9%	10%	8%	7%
PHYSICAL SCIENCES									
Fellowship	15%	15%	17%	15%	15%	24%	19%	27%	17%
Loans	0%	0%	0%	0%	0%	0%	0%	0%	--
Other/Own	14%	15%	12%	7%	14%	12%	6%	10%	19%
RA	49%	49%	50%	60%	52%	38%	19%	39%	33%
TA	21%	22%	20%	18%	20%	27%	56%	24%	31%
PROFESSIONAL SCHOOLS									
Fellowship	13%	15%	11%	19%	8%	23%	26%	23%	24%
Loans	2%	2%	2%	0%	3%	2%	2%	2%	--
Other/Own	72%	66%	77%	55%	75%	73%	70%	74%	57%
RA	8%	9%	7%	14%	8%	1%	0%	2%	11%
TA	6%	7%	4%	13%	5%	1%	2%	0%	8%
SOCIAL SCIENCES									
Fellowship	21%	21%	21%	23%	18%	44%	46%	45%	23%
Loans	2%	3%	2%	2%	3%	3%	4%	3%	1%
Other/Own	40%	38%	42%	31%	41%	38%	35%	35%	34%
RA	11%	12%	10%	14%	12%	3%	4%	3%	12%
TA	25%	26%	25%	30%	26%	13%	12%	15%	30%

* Total, Men, and Women include all foreign and domestic, and also include those for whom ethnicity/race is unknown.
Note: American Indians are included in the TOTAL NON-ASIAN MINORITIES and in the TOTAL, MEN and WOMEN figures.
Source: UC-NRC tapes, 'TABLE14A', 10-19-90, jl

TABLE 15

UNIVERSITY OF CALIFORNIA
Nine Campuses
Mean Time from Entry to Graduate School to Completion of Doctoral Degree
By Major Field of Doctorate -- Same or Different Baccalaureate Major

	1988				1978				1968			
	SAME BA/BS		DIFF BA/BS		SAME BA/BS		DIFF BA/BS		SAME BA/BS		DIFF BA/BS	
	Mean	Number	Mean	Number	Mean	Number	Mean	Number	Mean	Number	Mean	Number
Arts & Humanities	11.1	(201)	12.0	(91)	9.4	(200)	11.3	(76)	8.7	(104)	10.1	(27)
Engineering & CS	7.3	(301)	8.9	(65)	7.3	(172)	8.6	(44)	7.1	(133)	11.8	(12)
Life Sciences	7.9	(353)	8.6	(157)	6.9	(309)	7.6	(161)	6.9	(176)	7.2	(136)
Physical Sciences	6.9	(322)	8.6	(110)	6.5	(286)	7.9	(85)	5.8	(257)	7.7	(64)
Professional Schools	10.4	(30)	12.8	(118)	11.1	(34)	11.1	(116)	13.9	(57)	13.1	(105)
Social Sciences	9.2	(195)	11.4	(119)	8.3	(207)	9.0	(113)	7.3	(121)	9.6	(61)
ALL FIELDS	8.2	(1,402)	10.3	(660)	7.6	(1,208)	9.1	(595)	7.3	(848)	9.5	(405)

Source: UC-NRC tapes, 'TABLE15', 10-19-90, JL

TABLE 16

University of California at Berkeley
Relationship between Years of Teaching Assistantship and Time to Degree
Doctorate Recipients, May 1986 – May 1989
For Five Selected Departments in the Humanities and Social Sciences

Years of Teaching	Time to Degree		N
	MEAN	MEDIAN	
4 or More Years of Teaching Assistantship	10.1	9.6	27
Less than 4 Years of Teaching Assistantship	9.0	8.2	195
3 or more Years of Teaching Assistantship	9.9	9.2	65
Less than 3 Years of Teaching Assistantship	8.8	7.6	157
ALL STUDENTS:	9.1	8.2	222

* Calculation is based on 12 months of teaching.

Source: UCB, Graduate Division, BSPTS.WK1:FC, "latime", 4-18-90, mn

TABLE 17

Student Expenses, Student Fees and Financial Support*
In 1988 Constant Dollars

Years	Average Budget**	Living Costs	Fees	Tuition	Average Support (All Sources)	% Budget Covered By Financial Support
80-81	8,909	7,130	1,145	3,335	6,537	73 %
82-82	10,611	8,119	1,664	3,895	6,155	58 %
84-85	11,044	8,503	1,593	4,149	7,078	64 %
86-87	11,341	8,858	1,513	4,458	7,231	64 %
88-89	12,007	9,382	1,559	4,806	7,671	64 %

Source: 1988-89 Report on Student Financial Support

* The data in this table refer to all graduate students (doctoral and masters students combined).

**Includes living costs, fees, and a prorated amount of tuition based on nonresident enrollment.

Relationship between Time to Doctoral Degree and Years of Support During the First Five Years of Doctoral Studies by Sex

Doctorate Recipients, May 1986 - May 1989

For Five Selected Departments in the Humanities and Social Sciences

ALL TYPES OF SUPPORT*

(A) MEAN TIME TO PH.D. DEGREE

	Years of Support during the First Five Years												Overall	
	0-1yr		1-2yrs		2-3yrs		3-4yrs		4-5yrs					
	Mean Time	N	Mean Time	N	Mean Time	N	Mean Time	N	Mean Time	N	Mean Time	N	Mean Time	N
MALE	18.2	(6)	14.3	(6)	10.2	(9)	9.4	(20)	8.3	(39)	8.0	(24)	9.5	(104)
FEMALE	15.2	(7)	8.9	(2)	9.3	(7)	9.0	(28)	8.1	(44)	7.9	(30)	8.8	(118)
TOTAL	16.6	(13)	13.0	(8)	9.8	(16)	9.2	(48)	8.2	(83)	7.9	(54)	9.1	(222)

(B) MEDIAN TIME TO PH.D. DEGREE

Years of Support during the First Five Years														
	0-1yr		1-2yrs		2-3yrs		3-4yrs		4-5yrs		Overall			
	Median	N	Median	N	Median	N	Median	N	Median	N	Median	N		
Oyr	Time		Time		Time		Time		Time		Time			
MALE	19.7	(6)	13.9	(6)	10.2	(9)	9.2	(20)	7.6	(39)	7.6	(24)	8.2	(104)
FEMALE	19.7	(7)	8.9	(2)	8.2	(7)	8.4	(28)	7.6	(44)	7.2	(30)	7.7	(118)
TOTAL	19.7	(13)	12.7	(8)	9.7	(16)	8.6	(48)	7.6	(83)	7.4	(54)	8.2	(222)

* Types of support are: Fellowship, TA, RA, reader, and other employment. Loans are excluded. Expenses used in calculation of years of support are based on 12 month estimates.

Source: UCB, Graduate Division, BSPTS.WK1:FC, "mwsuplt", 4-18-90, mn

TABLE 19
University of California at Berkeley
Annual Expenses Covered by Financial Support
During the First Five Years of Doctoral Studies
Doctorate Recipients, May 1986 - May 1989
Five Selected Departments in the Humanities and Social Sciences
BY 5 TYPES OF SUPPORT*

Department	Year**	Type of Financial Support					TOTAL	Mean Time	N of Students
		TA	RA	Reader	Other Employ.	Fellow- ship			
		%	%	%	%	%	%		
A	1	0.0	6.9	9.1	4.0	10.1	30.2	9.7	(54)
	2	11.6	5.3	16.8	3.0	8.9	45.5		
	3	57.1	2.2	7.6	0.9	5.2	73.0		
	4	63.9	1.7	1.8	1.5	11.6	80.5		
	5	55.4	2.8	2.8	2.0	11.8	74.9		
B	1	57.4	0.0	0.0	1.4	6.3	65.1	9.4	(12)
	2	68.9	1.4	0.0	0.4	19.7	90.3		
	3	63.9	0.3	0.0	3.3	9.4	76.9		
	4	55.1	1.0	0.0	0.0	1.0	57.1		
	5	47.4	0.5	0.0	1.6	6.6	56.0		
C	1	2.5	5.3	11.5	3.0	16.3	38.4	9.8	(64)
	2	22.2	12.7	11.6	3.8	10.7	61.0		
	3	38.1	9.8	3.1	0.9	15.4	67.3		
	4	33.3	8.4	2.5	1.1	22.7	68.1		
	5	26.4	5.7	2.7	0.7	21.7	57.2		
D	1	29.5	20.3	0.9	0.3	27.5	78.4	6.7	(47)
	2	30.1	24.6	2.8	1.2	29.0	87.8		
	3	33.5	27.7	1.3	1.2	23.1	87.0		
	4	29.5	29.7	1.2	0.5	12.0	72.9		
	5	25.8	27.7	2.8	0.1	9.3	65.6		
E	1	11.8	12.2	5.2	0.9	22.3	52.3	10.0	(45)
	2	31.4	13.7	2.7	0.0	21.7	69.5		
	3	30.3	15.1	2.2	0.2	25.9	73.7		
	4	30.6	9.4	3.5	1.3	21.2	66.0		
	5	31.8	11.7	1.5	0.3	17.3	62.6		

* The annual financial support is based on 12 month calculations.

The annual student expenses are taken from the Student Financial Aid Budgets of the appropriate year. These budgets have been extrapolated to 12 months.

** The covered expenses are calculated for the first, second, third, fourth and fifth year in the program.

Source: UCB, Graduate Division, BSPT5.WK1:FC, "percfund", 4-19-90, mn

University of California
Nine Campuses
PERCENT ACCUMULATING DEBT
Doctoral Recipients (U.S. Citizens & Permanent Residents), 1988

	<u>TOTAL</u>	<u>MEN</u>	<u>WOMEN</u>	<u>ASIANS</u>	<u>WHITES</u>	<u>TOTAL NON-ASIAN MINORITIES</u>	<u>AFRICAN AMERICANS</u>	<u>CHICANOS/ LATINOS</u>
ALL DISCIPLINES								
No debt	41%	41%	40%	46%	42%	23%	21%	24%
Accumulated debt	59%	59%	60%	54%	58%	77%	79%	76%
Up to \$5K	35%	32%	40%	45%	36%	27%	39%	20%
\$5,001 - \$10K	30%	31%	28%	29%	29%	36%	23%	47%
\$10,001 - \$20K	23%	26%	20%	14%	25%	16%	13%	19%
More than \$20K	12%	11%	12%	12%	11%	21%	26%	14%
ARTS & HUMANITIES								
No debt	44%	39%	50%	36%	45%	37%	43%	29%
Accumulated debt	56%	61%	50%	64%	55%	63%	57%	71%
Up to \$5K	40%	37%	43%	44%	40%	35%	50%	33%
\$5,001 - \$10K	25%	20%	29%	33%	24%	24%	0%	33%
\$10,001 - \$20K	22%	28%	15%	0%	24%	18%	25%	17%
More than \$20K	14%	14%	13%	22%	12%	24%	25%	17%
ENGINEERING & CS								
No debt	53%	54%	48%	47%	55%	50%	0%	60%
Accumulated debt	47%	46%	52%	53%	45%	50%	100%	40%
Up to \$5K	38%	38%	43%	40%	40%	0%	0%	0%
\$5,001 - \$10K	34%	35%	29%	36%	32%	67%	0%	100%
\$10,001 - \$20K	19%	19%	14%	12%	21%	0%	0%	0%
More than \$20K	9%	8%	14%	12%	7%	33%	100%	0%
LIFE SCIENCES								
No debt	35%	35%	35%	38%	35%	15%	14%	16%
Accumulated debt	65%	65%	65%	63%	65%	85%	86%	84%
Up to \$5K	33%	28%	40%	30%	33%	30%	50%	19%
\$5,001 - \$10K	30%	32%	26%	30%	26%	61%	33%	75%
\$10,001 - \$20K	28%	30%	24%	25%	30%	4%	0%	6%
More than \$20K	10%	10%	10%	15%	10%	4%	17%	0%
PHYSICAL SCIENCES								
No debt	44%	45%	39%	56%	45%	10%	0%	15%
Accumulated debt	56%	55%	61%	44%	55%	90%	100%	85%
Up to \$5K	32%	32%	33%	83%	31%	11%	25%	0%
\$5,001 - \$10K	35%	34%	40%	17%	37%	28%	0%	45%
\$10,001 - \$20K	23%	24%	19%	0%	24%	33%	25%	36%
More than \$20K	10%	10%	7%	0%	7%	28%	50%	18%
PROFESSIONS								
No debt	43%	37%	47%	67%	42%	24%	33%	13%
Accumulated debt	58%	63%	53%	33%	58%	76%	67%	88%
Up to \$5K	38%	41%	34%	67%	40%	23%	50%	0%
\$5,001 - \$10K	25%	26%	23%	33%	23%	31%	33%	29%
\$10,001 - \$20K	16%	15%	17%	0%	17%	15%	17%	14%
More than \$20K	22%	18%	26%	0%	21%	31%	0%	57%
SOCIAL SCIENCES								
No debt	33%	32%	33%	38%	34%	21%	9%	31%
Accumulated debt	67%	68%	67%	62%	66%	79%	91%	69%
Up to \$5K	35%	28%	43%	38%	36%	35%	30%	45%
\$5,001 - \$10K	28%	29%	27%	13%	28%	26%	30%	27%
\$10,001 - \$20K	23%	27%	19%	38%	24%	17%	10%	27%
More than \$20K	13%	15%	12%	13%	13%	22%	30%	0%

Note: The TOTAL and the TOTAL NON-ASIAN MINORITIES include American Indians and those for whom ethnicity is unknown; figures for American Indians are not displayed because only 1 American Indian received a Doctorate in 1978 and only 9 American Indians in total received Doctorates in 1988.

Source: UC-NRC tapes, 'TABLE20', 10-19-80, j1

TABLE 21

**On-Campus Housing Expenses 1989-90
for Selected Campuses**

Campus	Housing Expenses	
	Single	Family
-----	-----	-----
Berkeley	NA	\$290.00
Davis	\$290.00	\$393.00
Irvine	\$255.00	\$506.00
Santa Barbara	\$418.00	\$436.00
Santa Cruz	\$432.00	\$470.00
San Diego	\$435.00	\$529.00
San Francisco	\$245.00	\$570.00
-----	-----	-----

Source: Campus Housing Offices.

TABLE 22

**Average Single Off-Campus Graduate Student Housing Expenses
(Dollars/Month) for Four Academic Years by Campus**

Campuses	Constant 1988 Dollars				% Increase 79-89
	79-80	82-83	85-86	88-89	
Berkeley	306	335	391	442	44%
Davis	264	271	322	366	39%
Irvine	406	391	488	491	20%
Los Angeles	404	436	473	570	41%
Riverside	334	352	395	419	25%
San Diego	311	339	360	410	32%
San Francisco	331	382	475	492	49%
Santa Barbara	267	346	388	451	57%
Santa Cruz	320	356	402	419	31%

Source: Student Expenses and Resources Survey. Office of the President, 1990.

TABLE 23

Percent of Graduate Students Living On and Off Campus, 1988-89

	On-Campus	Off-Campus
Berkeley	9.1	90.9
Davis	15.4	84.6
Irvine	39.1	60.9
Los Angeles	8.9	91.1
Riverside	26.8	73.2
San Diego	40.0	60.0
San Francisco	10.3	89.7
Santa Barbara	23.1	76.9
Santa Cruz	18.3	81.7
TOTAL	15.8	84.2

Source: Student Expenses and Resources Survey, 1988-89.

Note: On-Campus includes college dormitory, residence hall, apartment, or house.

Campus Child Care: 1987-88																
Campus	Lic Cpty	Ages Served	Fees	# Children Served By parental status				# Children on Wait List By Parental Status				# Graduate Student Parents		Total Grad Parents		
				Fac	Staff	Stud	Com	Total	Fac	Staff	Stud	Com	Total		Married	Single
Berkeley	201	3 mos - 8 years	\$360/mo	0	201	0	201	NA	NA	65	NA	65	65	1012	316	1328
Davis	85	6 mos - 5 years	\$218/qtr	Inc.	20	36	20	76	32	122	46	200	400	565	187	752
Irvine	124	3 mos - 12 years	\$440/mo ft \$200/mo ht	16	34	121	26	197	Inc.	482	314	23	819	355	355	456
Los Angele	80	2 mos - 60 mos	\$480/mo	5	27	44	15	91	Inc.	336	222	NA	558	1498	289	1787
Riverside	78	2.5 - 5 years	\$1.23/hr.	16	14	55	0	85	NA	NA	NA	NA	0	320	93	413
Santa Barb	132	15 mos - 7 years	\$325/mo	13	11	54	15	93	Inc.	31	58	10	99	235	145	380
Santa Cruz	45	3 mos - 9 years	\$480/mo	0	43	0	43	43	NA	NA	NA	NA	0	97	44	141
San Diego	75	11 mos - 5.5 yrs	\$380/mo	25	25	25	0	75	Inc.	160	80	0	240	307	115	422
San Francis	48	2 - 5 years	\$495/mo	Inc.	40	20	6	66	Inc.	120	60	31	211	365	116	481
TOTAL				872	171	599	82	927	1161	877	110	2148	4754	1406		6160

Source: The Challenge of Dependent Care

Systemwide Office of Employee Relations, 1989.

Table 25
University of California at Berkeley: Graduate Division
**GRADUATE STUDENT RETENTION FOR DOCTORAL STUDENTS
BY ETHNICITY
COHORT 1975-77**

Ethnic Group	Doctoral degree awarded as of May 88	Master's degree awarded as of May 88	No degree or pending* as of Nov 88	Total Graduate Degrees awarded as of Nov 88	Total N
All Minority	45% (183)	26% (107)	29% (116)	71% (290)	406
Asian	50% (111)	24% (53)	26% (59)	74% (164)	223
American Indian	36% (4)	45% (5)	18% (2)	82% (9)	11
African American	40% (31)	31% (24)	29% (23)	71% (55)	78
Chicano/Latino	39% (37)	27% (25)	34% (32)	66% (62)	94
Non-Asian Minority	39% (72)	30% (54)	31% (57)	69% (126)	183
White	52% (1,200)	23% (538)	24% (558)	76% (1,738)	2,296
Foreign	60% (361)	24% (144)	17% (101)	83% (505)	606
Other	40% (55)	29% (40)	32% (44)	68% (95)	139
Total	52% (1,799)	24% (829)	24% (819)	76% (2,628)	3,447

* We know from the doctoral progression status study of the 1975-77 cohort that 6% (200) of the cohort were pending as of Nov. 1988. We can expect that about half of all pending students will receive a doctoral degree. Overall, about 80% of all doctoral students leave Berkeley with a graduate degree: about 55% receive a doctoral degree and 24% a master's degree.

Source: Historical File, run date: 10-24-88

scr1ethndoc, 8-27-90, mn

Table 26
University of California at Berkeley
Doctoral Progression Status for the 1975-77 Cohort
TOTAL CAMPUS

	Attrition Rate Year 1-3*		Attrition Rate Year 4-12*		Pending as of Nov 88		Degree awarded as of May 88		Total N**
		N		N		N		N	
Men									
All Minority	35%	93	12%	33	6%	17	46%	123	266
White	29%	435	11%	158	5%	79	55%	827	1499
Foreign	31%	161	6%	32	2%	13	60%	315	521
Others/Unknown	31%	33	17%	18	7%	7	45%	48	106
Total Students	30%	722	10%	241	5%	116	55%	1313	2392
Women									
All Minority	37%	51	12%	17	9%	13	42%	58	139
White	30%	241	15%	118	9%	70	46%	366	795
Foreign	35%	30	8%	7	4%	3	53%	45	85
Others/Unknown	42%	14	30%	10	9%	3	18%	6	33
Total Students	32%	336	14%	152	8%	89	45%	475	1052
Total									
All Minority	36%	144	12%	50	7%	30	45%	181	405
White	29%	676	12%	276	6%	149	52%	1193	2294
Foreign	32%	191	6%	39	3%	16	59%	360	606
Others/Unknown	34%	47	20%	28	7%	10	39%	54	139
Total Students	31%	1058	11%	393	6%	205	52%	1788	3444

* Could include students who have left after obtaining only the master's degree.

** Number of students who entered the program between Fall 1975 and Spring 1978.

Source : Graduate Division, UCB, as of Nov. 1988. *scr/attri-short*, 8-27-1990, mn

University of California at Berkeley
Doctoral Progression Status for the 1975-77 Cohort
EIGHT MAJOR GROUPS

	<i>Attrition Rate</i> <i>Year 1-3*</i>		<i>Attrition Rate</i> <i>Year 4-12</i>		<i>Pending</i> <i>as of Nov 88</i>		<i>Degree awarded</i> <i>as of May 88</i>		<i>Total</i> <i>N**</i>
		<i>N</i>		<i>N</i>		<i>N</i>		<i>N</i>	
MEN									
Arts	30%	12	10%	4	3%	1	58%	23	40
Biological Sc.	24%	44	3%	6	2%	4	70%	128	182
Engineering	36%	214	7%	44	2%	12	55%	330	600
Lang & Lit	40%	77	20%	38	8%	16	32%	62	193
Nat. Resources	24%	27	10%	11	7%	8	59%	67	113
Physical Sc.	23%	141	9%	54	2%	10	67%	413	618
Professional Sch.	36%	92	16%	40	6%	16	42%	105	253
Social Sc.	29%	115	11%	44	12%	49	47%	185	393
Total	30%	722	10%	241	5%	116	55%	1313	2392

WOMEN									
Arts	38%	15	23%	9	18%	7	23%	9	40
Biological Sc.	30%	29	4%	4	1%	1	65%	64	98
Engineering	51%	20	5%	2	3%	1	41%	16	39
Lang & Lit	34%	68	25%	51	15%	30	26%	53	202
Nat. Resources	19%	11	16%	9	0%	0	65%	37	57
Physical Sc.	26%	27	7%	7	2%	2	65%	66	102
Professional Sch.	33%	81	13%	32	7%	17	47%	114	244
Social Sc.	31%	85	14%	38	11%	31	43%	116	270
Total	32%	336	14%	152	8%	89	45%	475	1052

TOTAL STUDENTS									
Arts	34%	27	16%	13	10%	8	40%	32	80
Biological Sc.	26%	73	4%	10	2%	5	69%	192	280
Engineering	37%	234	7%	46	2%	13	54%	346	639
Lang & Lit	37%	145	23%	89	12%	46	29%	115	395
Nat. Resources	22%	38	12%	20	5%	8	61%	104	170
Physical Sc.	23%	168	8%	61	2%	12	67%	479	720
Professional Sch.	35%	173	14%	72	7%	33	44%	219	497
Social Sc.	30%	200	12%	82	12%	80	45%	301	663
Total	31%	1058	11%	393	6%	205	52%	1788	3444

* Could include students who left after obtaining only the master's degree.

** Number of students who entered the program between Fall 1975 and Spring 1978.

Source : Graduate Division, UCB, as of 11/1988, "scr1attri-3-12", 8-27-90, mn

FACTORS DETERMINING TIME TO DEGREE AND ATTRITION

Institutional and Field-Specific Factors

1	Research Mode	Apprenticeship Mode Team Work Laboratory	Individualistic Learning Solitariness Library
2	Structure of Program	No M.A./M.S. required QE includes Dissertation Prospectus Annual Evaluation	M.A./M.S. required QE does not include Dissertation Prospectus Sporadic Evaluations
3	Dissertation Definition	Test of Future Ability to do Research	Contribution to Knowledge (Book)
4	Mentoring	Faculty Mentoring Departmental Advising	Absence of Faculty Mentoring and Dept. Advising
5	Research Money	Many Sources	Few Sources
6	Type of Financial Support	Research Assistantship Fellowships	Teaching Assistantship Loans Own Earnings
7	Campus Facilities Housing Child-care Space Transportation Library	Affordable Available Available (Office, Meeting) Efficient, Affordable Long Hours, Year round	Expensive Overcrowded Overcrowded Slow, Expensive Short Summer Hours
7	Job Market Post-doc Academic Industry	Many Openings Well-paid	Few Openings Medium or Low Salaries

**SHORT TIME
(LOW ATTRITION)**

**LONG TIME
(HIGH ATTRITION)**

Maresi Nerad, 7-27-1990, "src\modelcpec", mn

Doctoral Requirements UC Berkeley 1978-1988

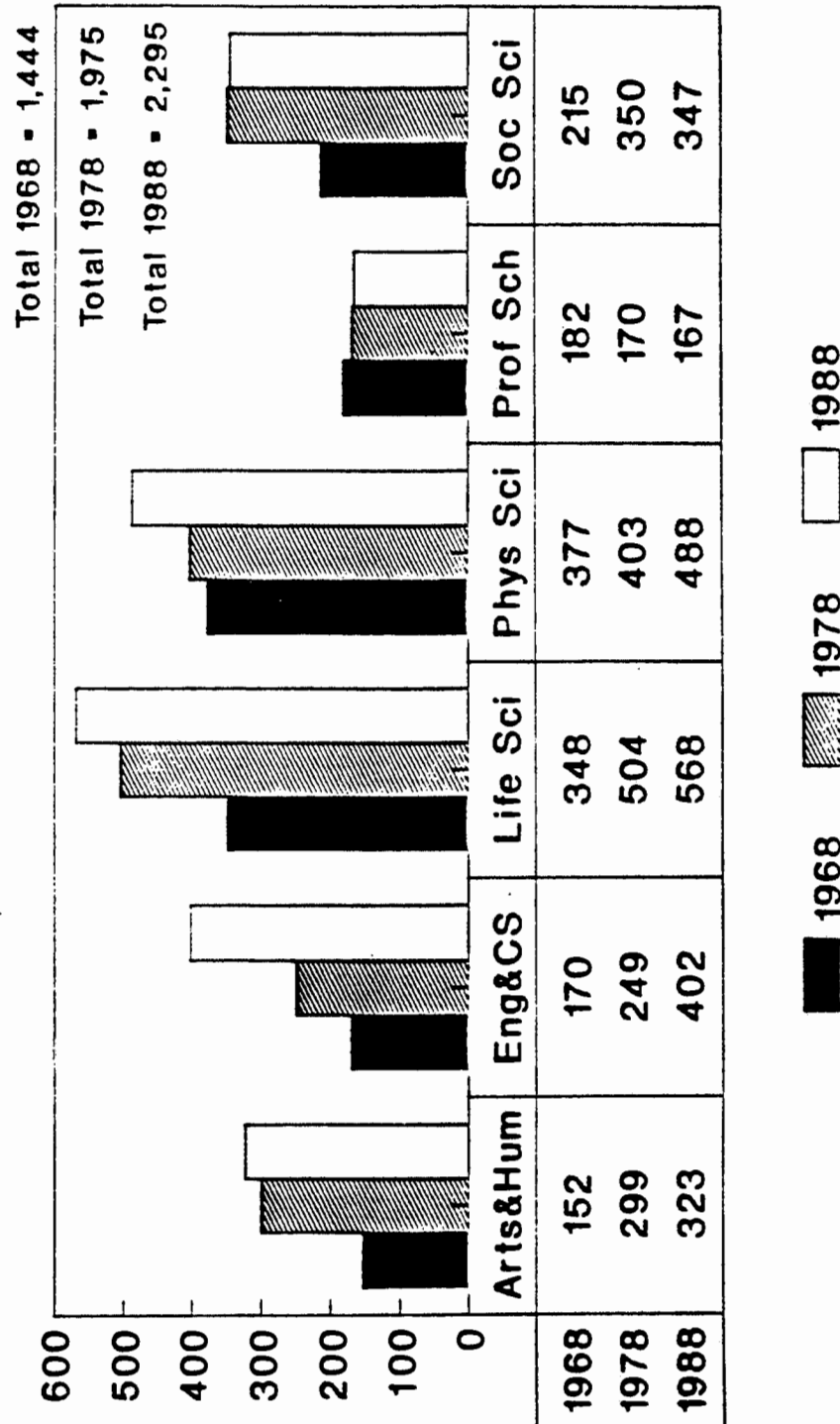
Departments	1978 Requirements	Years Changes in Program (Between 1979-88)	1988		
			Years to degree.	Median	N
Biochemistry	Masters not required. Individualized research program with advisor (5 seminars). 1 foreign language proficiency exam. Must teach 2 quarters. Qualifying Exam at end of 2nd year. Dissertation developed w/advisor. Dissertation.	4 seminars. Annual progress reviews. Many new research methods. No foreign language required.	1980-84	5.2	45
			1984-89	5.6	69
Electrical Engineering & Computer Science	Masters implicitly required. Major: 6 grad courses (indiv. program w/advisor). 2 Minors: 3 grad courses each, 1 minor outside EECS. Prelims (oral) based on 4 courses taken all at once by 2nd year. No language requirement. Qualifying Exam taken by 3rd year. includes dissertation. Dissertation.	R.A. research may be used to fulfill some requirements. Prelims on 3 areas can be spread out (not taken at once). Additional: Students must teach 1 semester.	1980-84	5.2	176
			1984-89	5.2	269
English	Masters not required. 12 courses, 5 comprehensive areas. Field exams. Proficiency in 3 foreign languages or advanced knowledge in 1, proficiency in an additional language. Teaching not required, but is most common form of financial support. Qualifying Exam (oral) taken after coursework (includes dissertation topic). Prospectus 25-40 pages, a "prima facie case." Dissertation.	10 courses, 5 areas. Deleted field exams, added coursework in Chaucer, Shakespeare. Prospectus 20-25 pages a "preliminary working paper."	1980-84	8.9	55
			1984-89	8.6	73
History	Masters required. 8 courses, 3 fields. Up to 4 languages, depending on field. Teaching not required, but is most common form of financial support. Qualifying exam (oral). Prospectus <u>after</u> qualifying exam. Dissertation.	More strict about time to degree. Must hand in prospectus at least 6 months after qualifying exam.	1980-84	9.4	76
			1984-89	8.6	87
Sociology	Masters required. 11 courses: 9 pre-M.A., 2 post-M.A. 3 courses may be advanced undergrad level or independent study (299). 5 papers. No formal language requirement, but committee may require. Teaching not required but is most common form of financial support. Qualifying exam tutorials in 3 fields or orals in 4 fields. Prospectus <u>after</u> qualifying. Dissertation.	Only graduate level coursework counts toward degree. 8 pre-M.A., 3 post-M.A. Theory & Methods course is now 4 units (more work).	1980-84	9.7	55
			1984-89	9.2	73

Source: Departmental Graduate Handbooks and General Catalogs.

N = Number of students.

Departments	UCSB	UCLA	UCI
Biochemistry	6 courses + 2 seminars per year for 3 years. 1 language. Masters not required. No teaching requirement. 2 Q.E.s: both written research proposals + oral defense, taken by 3rd year (the 2nd Q.E. is dissertation research prospectus). Dissertation. Oral Defense.	11 courses. No language. Masters not required. 1 year teaching. 3 written reports. Q.E. oral based on a research proposal by end of 2nd year. Prospectus separate. Dissertation.	7 courses, 3 seminars. No language. Masters not required. Teaching required. Must be associated with labs of 3 different investigators. Comprehensive exam, 2nd year, then specific research project w/faculty. Q.E. by end of 3rd year is on proposed dissertation (prospectus). Dissertation.
EECS	Tailored program, no set courses. No language. Masters not required. No teaching requirement. Specialty area + 2 separate tech. areas. Prelims on areas Q.E. Prospectus. Dissertation. Final defense.	Program planned with adviser. No language. Masters not required. No teaching requirement. No prelims specified. Q.E. (does not specify). Dissertation.	Must enroll in weekly dept. seminar for 4 quarters. No language. Masters not required. Teaching required. Must be accepted into research group during first quarter. Prelims first year. Q.E. includes prospectus. Dissertation. Final defense.
English	12 courses. 1-2 languages Masters required. Comprehensive exam. Teaching not required Q.E. on 3 areas, 1 in dissertation field. Prospectus. Dissertation.	9 courses, then "as many seminars as possible." 1-2 languages. Masters required. 3 comprehensive exams. Teaching not required, but "strongly recommended." Q.E. on areas, includes prospectus. Dissertation. Final defense.	2 years of full-time enrollment in graduate coursework. 2 languages. Masters not required 4 written exams. Teaching not required. Q.E. Prospectus. Dissertation. Final defense optional.
History	9 courses. At least 1 language. Masters required. Teaching required. Q.E. 4 fields, 3 written, 1 oral. Prospectus. Dissertation. Final defense.	Courses to cover 4 fields, at least 1 continuous 2-3 quarter seminar. 1-2 languages. Masters not required, but "substantial research paper" before Q.E. is required. Teaching not required, but strongly recommended. Q.E. by end of 9th quarter: written exam on major field, oral on 4 fields, prospectus. Dissertation.	4 required core courses/seminars/colloquia Language req. not explicit. Masters implicitly required. Teaching required. Q.E. written and oral on 4 fields and prospectus. Dissertation. Final defense.
Sociology	4 core courses. No language. Masters required. Teaching not required. Prelims in 2 areas. Q.E. on prospectus. Dissertation. Final defense.	12 courses. 1 language. Masters required. Teaching not required. Q.E. Prospectus. Dissertation.	(Social Networks). Core coursework and individualized program. 1 language. Masters not required. Teaching not required. Q.E. by end of 3rd year, based on prospectus. Dissertation. Final defense.

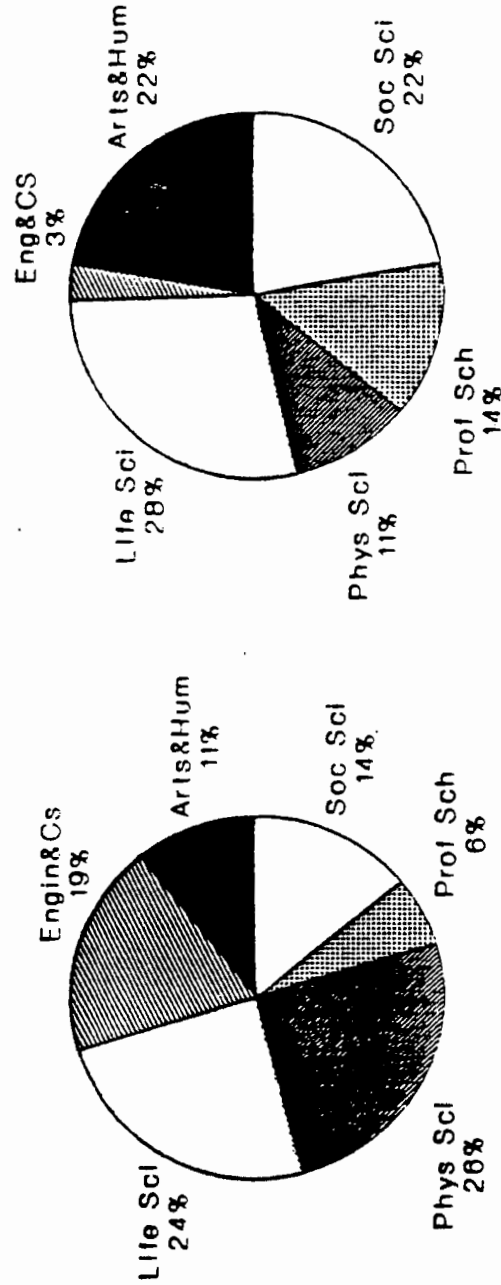
NUMBER OF DOCTORATE DEGREES AWARDED UNIVERSITYWIDE BY DISCIPLINE 1968, 1978, and 1988



Source: National Research Council, SED

DISTRIBUTION OF DOCTORAL RECIPIENTS BY DISCIPLINE FOR DEGREES AWARDED 1980 TO 1988

Universitywide

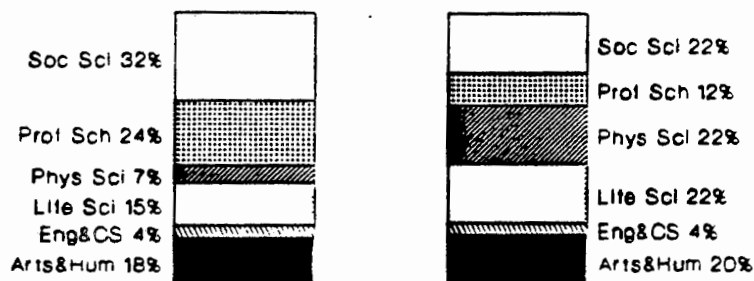


MEN
(N = 13,039)

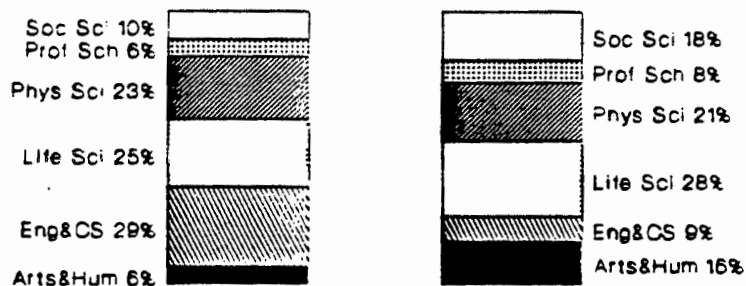
WOMEN
(N = 5,587)

Source: National Research Council, SED

DISTRIBUTION OF DOCTORAL RECIPIENTS BY MAJOR FIELD FOR DEGREES AWARDED 1980 TO 1988 (U.S. Citizens & Permanent Residents) UNIVERSITYWIDE

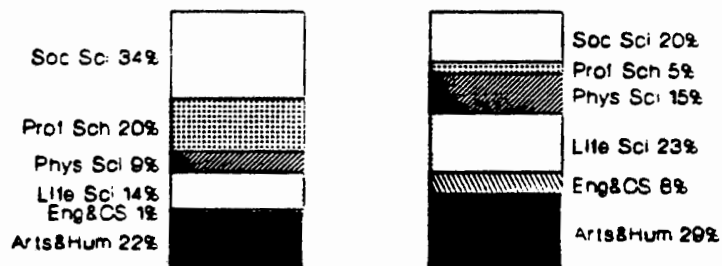


AFRICAN AMERICAN (N = 321) AMERICAN INDIAN (N = 51)



ASIAN (N = 1,163)

WHITE (N = 12,204)

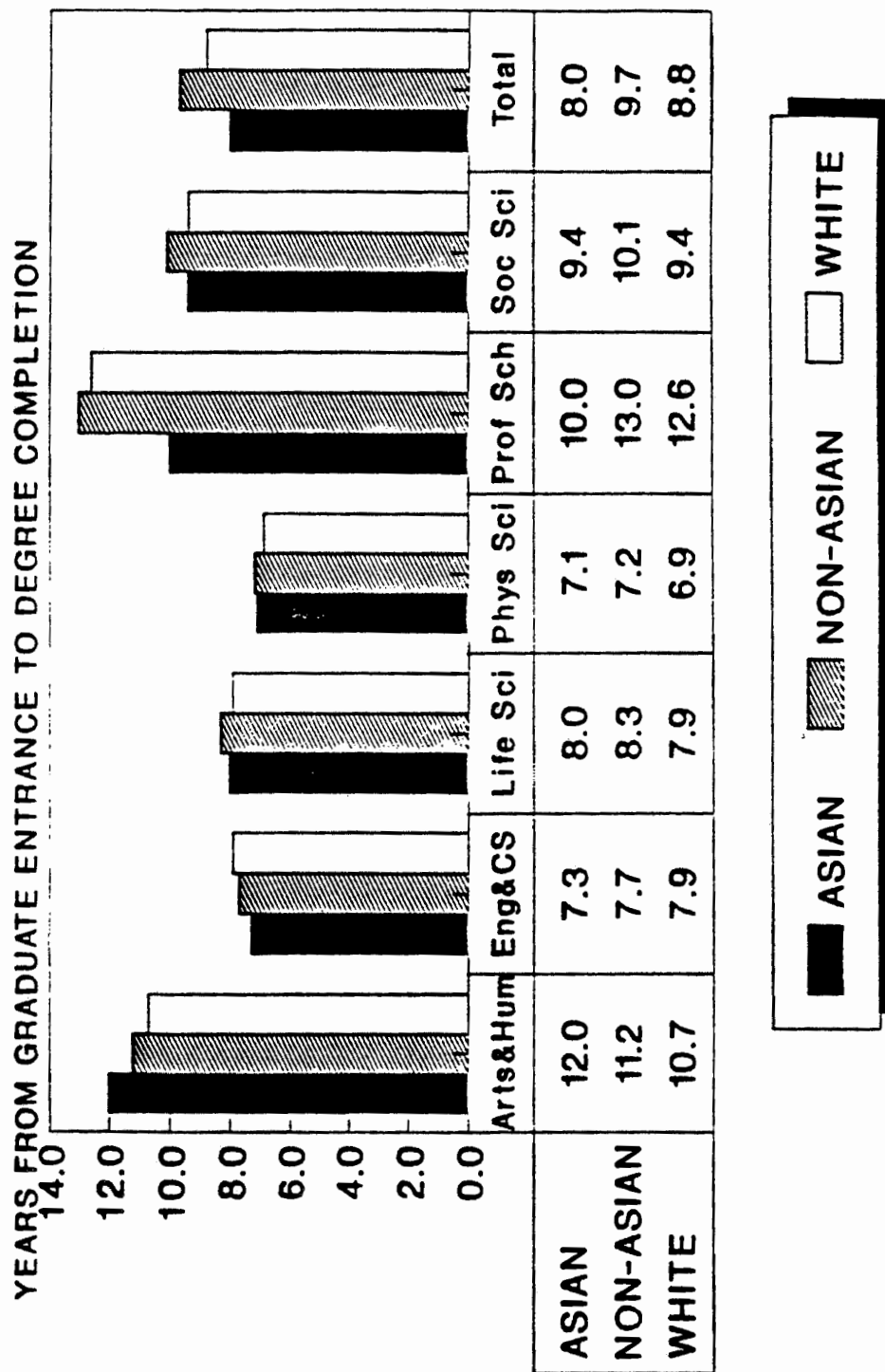


CHICANO (N = 223)

LATINO (N = 326)

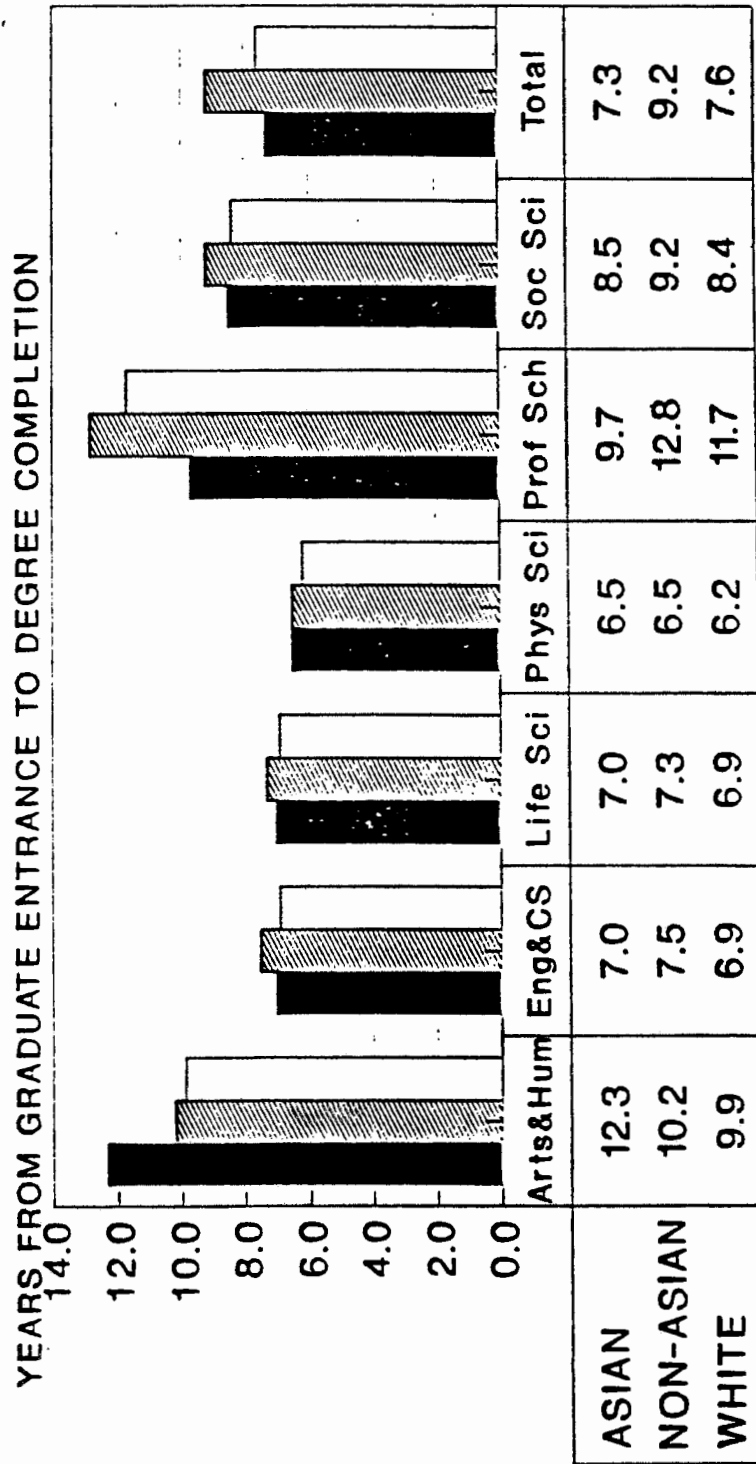
Source: National Research Council, SED

MEAN TIME TO DOCTORAL DEGREE, 1980-88 ASIANS/NON-ASIAN MINORITIES/WHITES UNIVERSITYWIDE, BY DISCIPLINE



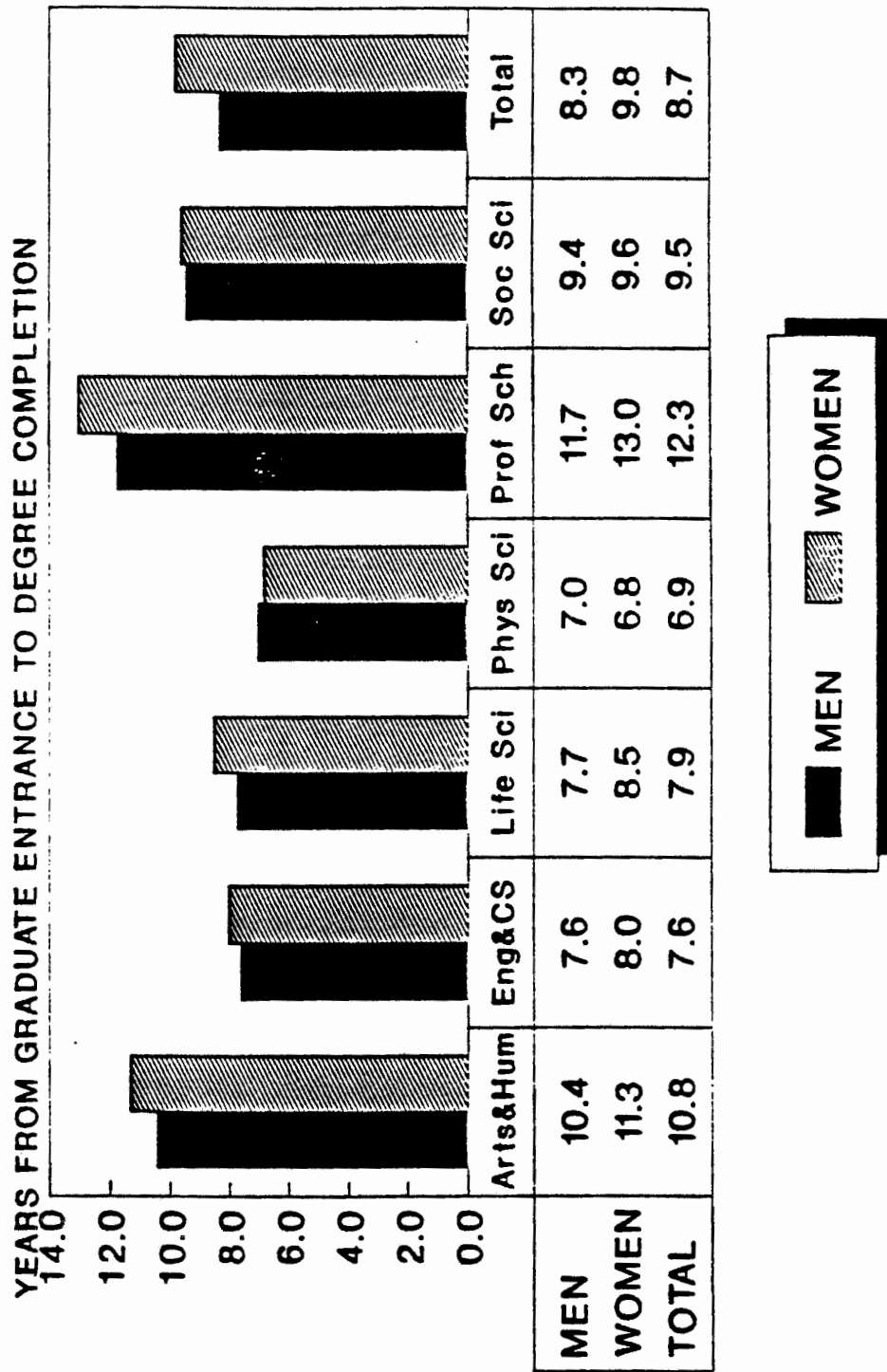
Source: National Research Council, SED

MEDIAN TIME TO DOCTORAL DEGREE, 1980-88 **ASIANS/NON-ASIAN MINORITIES/WHITES** **UNIVERSITYWIDE, BY DISCIPLINE**



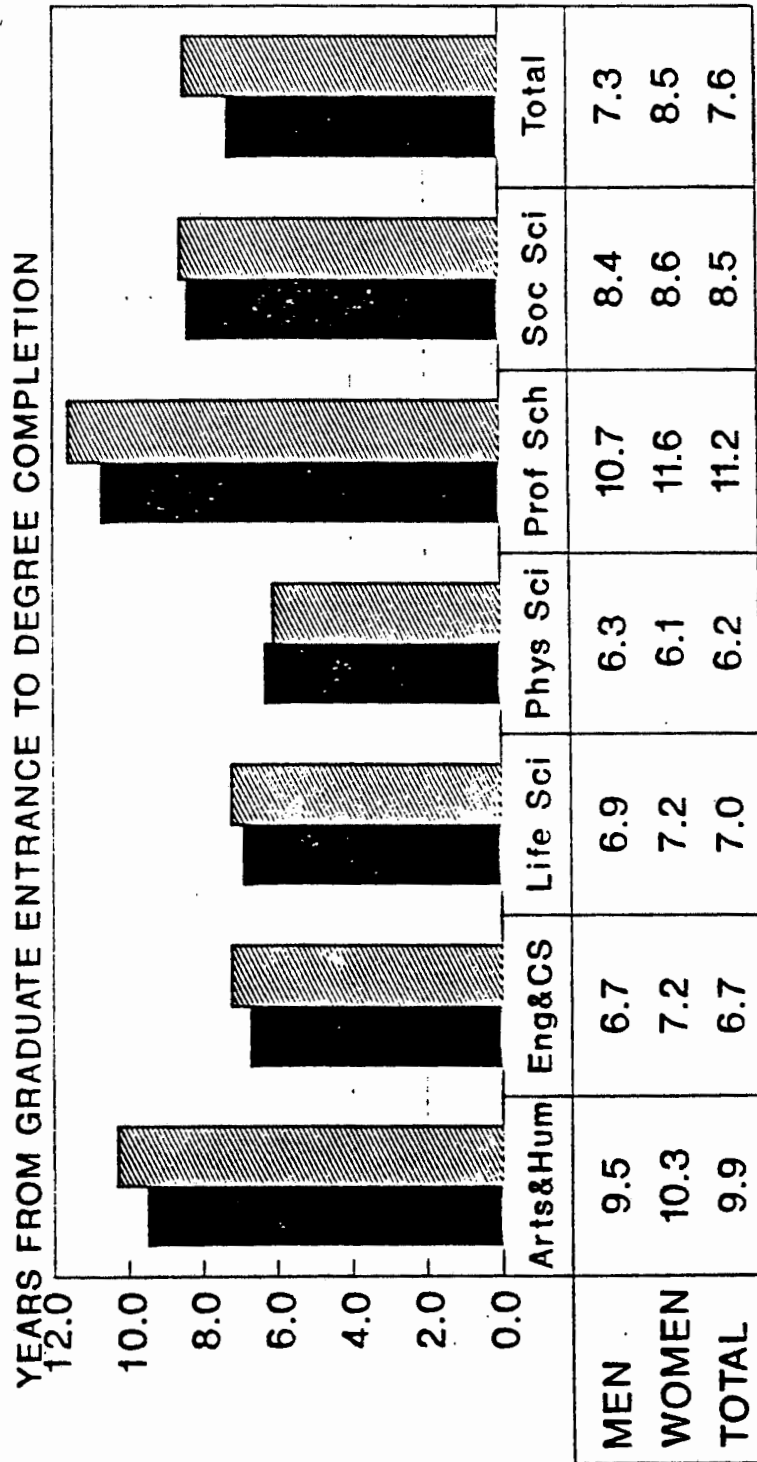
Source: National Research Council, SED

MEAN TIME TO DOCTORAL DEGREE, 1980-88 MEN/WOMEN BY DISCIPLINE UNIVERSITYWIDE



Source: National Research Council, SED

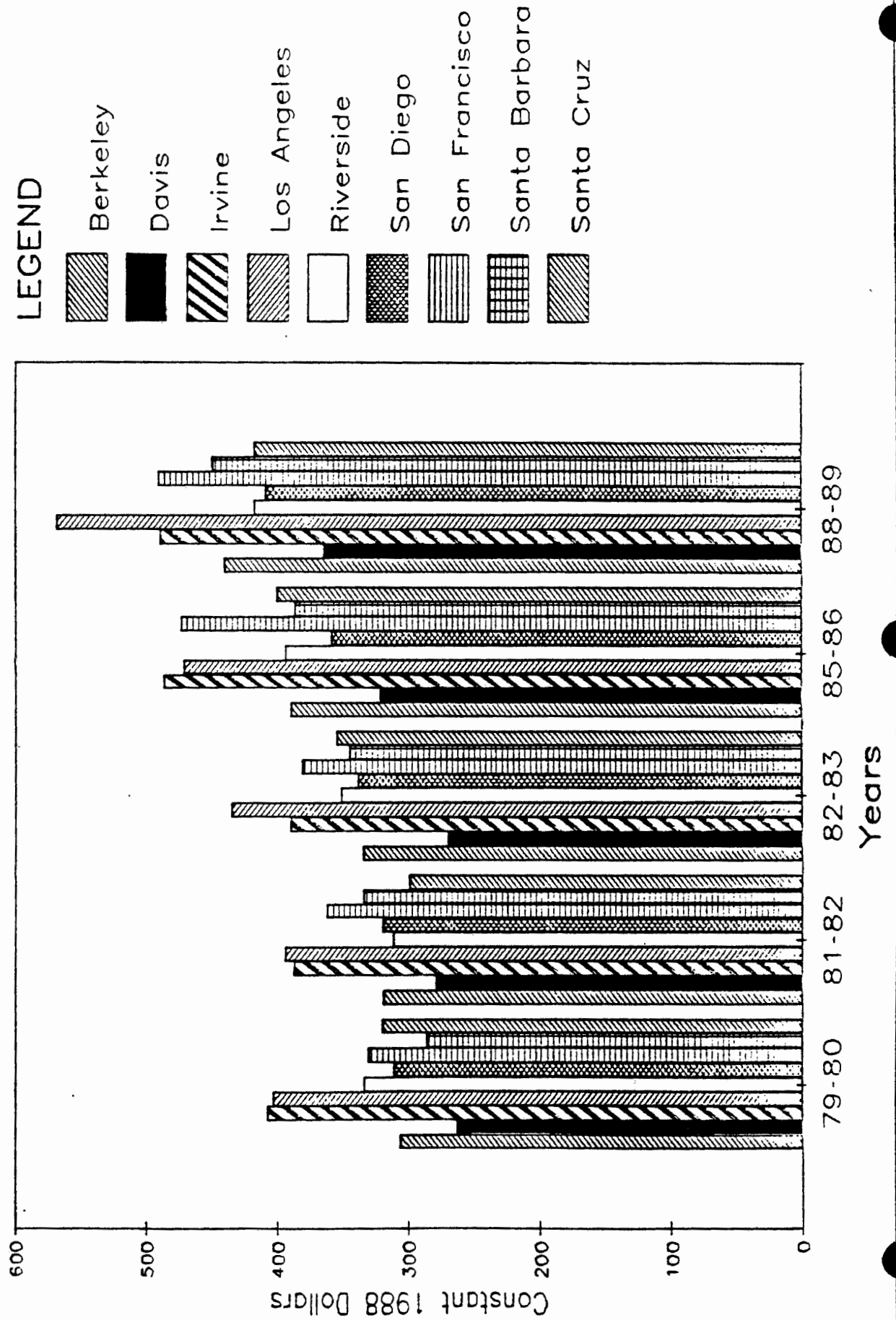
MEDIAN TIME TO DOCTORAL DEGREE, 1980-88 MEN/WOMEN BY DISCIPLINE UNIVERSITYWIDE



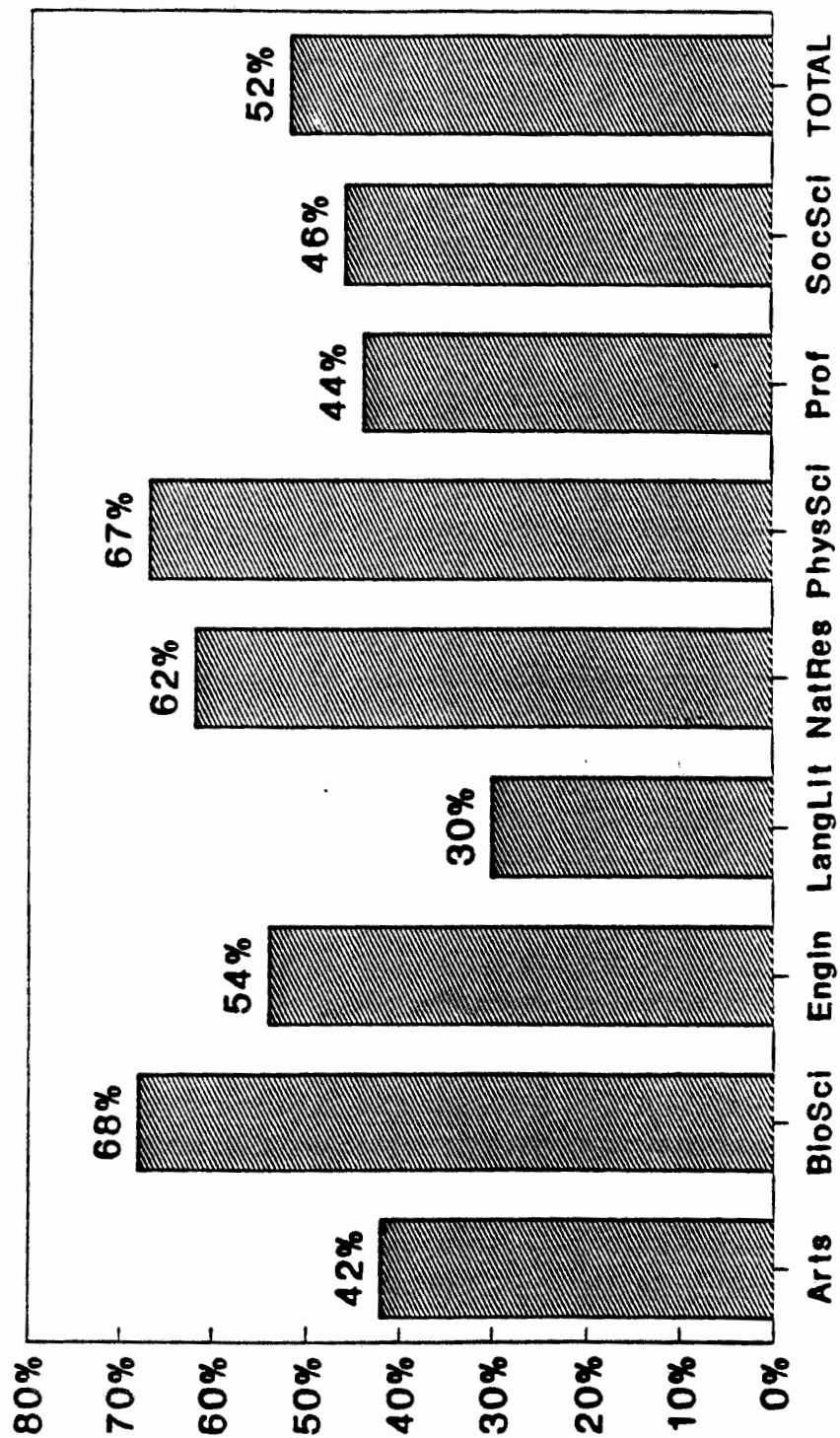
Source: National Research Council, SED

GRAPH 6

Average Single Off-Campus Housing Expenses by Campus and Graduate Status



Doctoral Completion Rates 1975-77 Cohort by Eight Fields of Study As of November 1988



University of California at Berkeley

APPENDIX A

APPENDIX A

NRC MAPPING OF MAJORS TO DISCIPLINES

ARTS & HUMANITIES

- Archeology
- Art
- Art History
- Classics
- Foreign Languages and Literature
- History
- Letters
- Music
- Philosophy
- Religion
- Theater

ENGINEERING & COMPUTER SCIENCES

- Computer Sciences
- Engineering
- Information Sci. & Systems

LIFE SCIENCES

- Agriculture
- Audiology & Speech Pathology
- Biological Sciences
- Environmental Health
- Epidemiology
- Nursing
- Public Health
- Veterinary Medicine
- Zoology

PHYSICAL SCIENCES

- Astronomy
- Atmospheric & Meteorological Sciences
- Chemistry
- Geological Sciences
- Hydrology & Water Resources
- Marine Sciences
- Mathematics
- Oceanography
- Physics

PROFESSIONAL SCHOOLS

- Architecture
- Business & Management
- Communications
- Education
- Home Economics
- Law
- Library & Archival Science
- Public Administration
- Social Work
- Teacher Education
- Teaching Fields

SOCIAL SCIENCES

- Anthropology
- Area Studies
- Demography
- Economics
- Geography
- International Relations
- Political Sciences & Public Policy
- Psychology
- Sociology
- Urban Studies

APPENDIX B

APPENDIX B

LIST OF DOCTORAL DEGREES OFFERED AT U.C.

D. Env.	Doctor of Environment
D. Eng.	Doctor of Engineering
D. L.I.S.	Doctor of Library and Information Studies
D. M.A.	Doctor of Musical Arts
D. M.H.	Doctor of Mental Health
Dr. P.H.	Doctor of Public Health
D. N. Sc.	Doctor of Nursing Sciences
D. S.W.	Doctor of Social Welfare
Ed. D.	Doctor of Education
J.S.D.	Doctor of Juristic Science
Ph.D.	Doctor of Philosophy

APPENDIX C

This form is to be returned to the GRADUATE DEAN, for forwarding to

The Office of Scientific and Engineering Personnel
National Research Council
2101 Constitution Avenue, Washington, D C 20418

Please print or type.

1. Name in full _____
 Last Name First Name Middle Name

Cross Reference Maiden name or former name legally changed _____

2. Permanent address through which you could always be reached (Care of if applicable) _____

Number		Street	City
State	Zip Code	Or Country if not U.S.	

3. U.S. Social Security Number. _ _ _ - _ _ - _ _ _

4. Date of birth Month Day Year Place of birth State Or Country if not U S

5. Sex 1 ☐ Male 2 ☐ Female

8. Are you physically handicapped? ☐ Yes ☐ No

6. Marital status 1 ☐ Married
 2 ☐ Not married (including widowed, divorced)

- 1 ☐ Visual 2 ☐ Orthopedic
3 ☐ Auditory 4 ☐ Vocal
5 ☐ Other (Specify) _____

7. Citizenship
0 = U.S. native
1 = U.S. naturalized
2 = Non-U.S. Immigrant (Permanent Resident).

9. What is your racial background? (Check only one)

- 0 American Indian or Alaskan Native
1 Asian or Pacific Islander
2 Black
3 White

- 3 = Non-U S Non-Immigrant (Temporary Resident).

- 10a Is your ethnic heritage Hispanic? ☐ Yes ☐ No

- 10b. If yes, is it
- | | | |
|---|-------|------------------|
| 0 | _____ | Mexican American |
| 1 | _____ | Puerto Rican |
| 2 | _____ | Other Hispanic |

11. Number of dependents _____ Do not include yourself (Dependent - someone receiving at least one half of his or her support from you)

EDUCATION

12. Location of high school last attended _____ Year of graduation from high school: _____
State or County, if not U.S.

13. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges and each degree earned. List chronologically, and include your doctoral institution as the last entry.

[illegible]

14. In the spaces below, categorize the period of years between receiving your first baccalaureate degree (or equivalent) and receiving your doctorate including the period spent on your thesis and/or dissertation. If necessary, round years so that your total will equal Year of Doctorate minus Year of Baccalaureate

- 1 Number of years as full-time student _____
2 Number of years as part-time student _____
3 Number of years not working on degree _____
Total = Year of Doctorate minus Year of BA = _____

15. Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a musical or literary composition (not a dissertation) is a degree requirement, please check box ☐.

Title _____	Classify field using Specialties List

	Number Name of field

16. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program _____

Department Institute Committee Program.

School

18. What is your best estimate of the percentage of support received from the following sources during the course of your graduate study? (Total should equal 100%)

%	%	%	%
Own Family Resources	Research Assistant	Other Dept of Ed	Student Loans
a ☐ Own Earnings	i ☐ NSF	q ☐ Veterans Administration (G.I. Bill, etc.)	v ☐ Guaranteed Student Loan
b ☐ Spouse's Earnings	j ☐ NIH	4 ☐ USDA Fellowship	w ☐ National Direct Student Loan
c ☐ Family Contributions	2 ☐ USDA	r ☐ Other Federal	x ☐ Other Loan
University-Related	k ☐ Other Federal		
d ☐ Teaching Assistantship	Other Federal Support		
e ☐ Research Assistantship	3 ☐ NSF Fellowship	Specify	Specify
f ☐ University Fellowship	l ☐ NIH Traineeship	U.S. Nationally Competitive Fellowships (Non-Federal)	Other Sources
g ☐ College Work-Study	m ☐ Other HHS	s ☐ Ford Foundation	y ☐ Business Employer Funds
h ☐ Other	n ☐ Title VI Foreign Language & Area Studies Fellowship	t ☐ Rockefeller Foundation	z ☐ Foreign (Non-U.S.) Govt
Specify	o ☐ Graduate & Professional Opportunities Program Fellowship (G*POP)	u ☐ Other Fellowship	5 ☐ Other
		Specify	Specify

19. When you receive your doctorate degree, will you have any debt directly related to your undergraduate and/or graduate education (tuition and fees, living expenses, books and supplies, transportation to and from school)?

Yes ☐ No ☐

If yes, what will be the level of this cumulative debt?

- 1 ☐ \$5,000 or less
 2 ☐ \$5,001-\$10,000
 3 ☐ \$10,001-\$20,000
 4 ☐ \$20,001-\$30,000
 5 ☐ \$30,001 or more

- 20a. Please check the category which most fully describes your status during the year immediately preceding the award of the doctorate

- 0 ☐ Full-time employed (Go to item 20b)
 1 ☐ Held fellowship
 2 ☐ Held assistantship
 3 ☐ Part-time employed
 4 ☐ Not employed
 5 ☐ Other (specify) _____

- 20b. If full-time employed, what type of position did you hold?

- 6 ☐ College or university faculty
 7 ☐ College or university, non-faculty
 8 ☐ Elem. or sec. school teaching
 9 ☐ Elem. or sec. school, non-teaching
 (11) ☐ Industry or business
 (12) ☐ Other (specify) _____

POSTGRADUATION PLANS

21. What is the status of your current postgraduate plans?

- 0 ☐ Am returning to or continuing in predoctoral employment
 1 ☐ Have signed contract or made definite commitment
 2 ☐ Am negotiating with one or more specific organizations
 3 ☐ Am seeking position but have no specific prospects
 4 ☐ Other (specify) _____

22. What best describes your immediate postgraduate plans?

- | | |
|--|-----------------|
| 0 ☐ Postdoctoral fellowship | } Go to Item 23 |
| 1 ☐ Postdoctoral research associateship | |
| 2 ☐ Traineeship | |
| 3 ☐ Other study (specify) _____ | } Go to Item 24 |
| 4 ☐ Employment (other than 0,1,2,3) | |
| 5 ☐ Military service | |
| 6 ☐ Other (specify) _____ | |

23. If you plan to have a postdoctoral fellowship, associateship, traineeship, or otherwise undertake further study

- A. What will be the field of your postdoctoral study? Please enter number from Specialties List _____

- B. What will be the primary source of research support?

- 0 ☐ U.S. Government
 1 ☐ College or university
 2 ☐ Private foundation
 3 ☐ Nonprofit, other than private foundation
 4 ☐ Other (specify) _____
 6 ☐ Unknown

Go to Item 25

24. If you plan to be employed, enter military service, or other

- A. What will be the type of employer?

- a ☐ U.S. 4-year college or university other than medical school
 b ☐ Foreign university
 c ☐ Medical school
 d ☐ Jr. or community college
 e ☐ Elem. or sec. school
 f ☐ Foreign government
 g ☐ U.S. Federal government
 h ☐ U.S. state government
 i ☐ U.S. local government
 j ☐ Nonprofit organization
 k ☐ Industry or business
 l ☐ Self-employed
 m ☐ Other (specify) _____

- B. Indicate what your primary work activity will be with 1 in appropriate box, secondary work activity (if any) with 2 in appropriate box

- 0 ☐ Research and development
 1 ☐ Teaching
 2 ☐ Administration
 3 ☐ Professional services to individuals
 5 ☐ Other (specify) _____

- C. In what field will be your working? Please enter number from Specialties List _____

25. What is the name and address of the organization with which you will be associated?

Name of Organization _____

Street _____

City State _____

Or Country if not U.S. _____

BACKGROUND INFORMATION

26. Please indicate, by circling the highest grade attained, the education of

your father	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD, PhD	Postdoctoral
		Elementary School	High School	College	Graduate	
your mother	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD, PhD	Postdoctoral
	0	1 2 3	4 5	6 7	8 9	(11)

Signature _____ Date _____

If you would like to receive a summary of the results of this survey, please check box ☐

APPENDIX D

Introduction

Through doctoral education, talented students master the advanced concepts of a particular field of intellectual inquiry and develop the capacity to make independent contributions to knowledge. The quality of students entering our doctoral programs, after a period of decline, is now showing signs of recovery; some (though not enough) of our most talented U.S. college graduates are enrolling in doctoral programs, and these programs draw some of the best students from foreign countries as well.

Closer examination, however, reveals several disturbing trends:

- The proportion of U.S. students earning doctoral degrees has been declining for two decades, and the absolute number of U.S. doctorate recipients has been declining for more than a decade.
- The proportion of the very strongest students enrolling in doctoral programs has been declining for more than two decades;¹ it is not clear whether recent signs of recovery are the beginning of a sustained reversal.
- Many of those students who do enroll are taking too long to complete their degrees: in 1988, the median registered time-to-degree was 6.9 years.²

1. The proportion of Rhodes Scholars, Phi Beta Kappa recipients, and students in the top 3-5% of college classes who enroll in doctoral programs has been decreasing since the late '50s and early '60s. Arthur M. Hauptman, *Students in Graduate and Professional Education: What We Know and Need to Know* (Washington, D.C.: Association of American Universities/St. Mary's Press, 1986).
2. Total time-to-degree (TTD) is the calendar time between earning a bachelor's degree and a doctorate; registered time-to-degree (RTD) includes only time in graduate school.

AGS Task Force on Institutional Policies Governing

Doctoral Education

John D'Arms (co-chair)
Vice Provost for Academic Affairs and Dean
University of Michigan
AGS President

Theodore Ziolkowski (co-chair)
Dean of the Graduate School
Princeton University
AGS Vice President

Allison Casarotti
Dean of the Graduate School
Cornell University

Joseph Califano
Deputy Executive Director
University of California, Berkeley

William G. ...

INSTRUMENTAL RESEARCH

BY ROBERT D. HARRIS

EDITION

1967

1967

1967

1967

- Attrition appears to be disturbingly high; although national data are not available, estimates place the average attrition rate at 50 percent, and it is often higher in some fields of the humanities.

The well-documented projections of severe shortages of Ph.D.s beginning in just a few years make these trends in doctoral education all the more disturbing.³

The Charge

Because of their concern about these projected shortages and the trends in doctoral education which are impeding Ph.D. production, the member presidents and chancellors of the Association of American Universities (AAU) asked the Association of Graduate Schools (AGS), comprising the graduate deans of their institutions, to recommend institutional policies which can improve the effectiveness and efficiency of doctoral programs.

The AGS Executive Committee appointed a task force of graduate deans to carry out this request. A draft report prepared by that group was discussed by the AGS graduate deans at their 1990 annual meeting. A revised report was submitted to the AAU presidents and chancellors for their consideration at their fall meeting. Changes recommended by both groups have been incorporated into this text, which contains the joint views and recommendations of AAU and AGS.

Institutional and Individual Differences and the Nonacademic Environment

Graduate education is organized in diverse ways in this country's research universities. Institutions and departments vary in their traditions, practices, size, and comprehensiveness. Academic fields differ in disciplinary ethos, programmatic requirements, and funding patterns. We have sought to provide clear descriptions of current problems and to offer recommendations for improvement. But we recognize and stress at the outset that institutions and departments experience those problems to differing degrees and will need to implement our recommendations in ways appropriate to their particular circumstances. We are aware that a number of institutions have established or are developing policies that incorporate some of these recommendations.

Moreover, we understand that graduate students differ greatly in their capacity for effective self-direction and their need for advice and support. Our recommendations are intended to promote an educational environment that will better inform choices by graduate students; obviously, these recommendations will prove more useful to some than to others.

Further, our report restricts itself to the academic environment. We do not thereby intend to imply that such problems as housing, health care, child care, and socialization into the university community are unimportant. Indeed, these issues take on increased importance with the increasing diversity of our graduate student bodies. The mixture of students of different races and cultures enriches the intellectual and social context of our graduate programs but adds new challenges as well. Although the resources available to meet even basic academic needs are limited, we believe that universities should strive to provide a supportive environment for all graduate students, one which enables them to confront their academic challenges with minimal distractions and therefore with better chances of success.

3. William G. Bowen and Julie Ann Sosa, *Prospects for Faculty in the Arts and Sciences* (Princeton, NJ: Princeton University Press, 1989); Richard C. Atkinson, "Supply and Demand for Scientists and Engineers: A National Crisis in the Making," *Science* 248 (April 1990), 425-432.

Institutional Policies Governing Doctoral Education: Problems and Recommendations

We believe that the reduced participation in doctoral programs by U.S. students is caused in part by the costs and risks reflected in long times-to-degree and high attrition rates. Moreover, we see ample evidence that lax practices and unenforced policies within universities contribute to high attrition and prolonged completion times. We recognize that there are clear limits to what can and should be done about these problems: not all students who enroll in doctoral programs should complete them; some of those who do not finish nonetheless benefit from graduate study; many factors which may extend time-to-degree reflect legitimate academic considerations; some of the causes of attrition and extended completion times are beyond the control of institutions and their faculty. The severity of these problems varies greatly by discipline, institution, and department. The task for university administrators responsible for doctoral education is to identify those contributory factors over which we can exert control and to adopt policies that will minimize their impact.

No set of policies, however carefully crafted, can succeed without the active participation of the faculty who carry out graduate education; to bring about the program improvements that are needed, it is imperative that administrators secure the understanding and support of the faculty.

Teaching by Graduate Students

Problems

Since virtually all doctoral students, whether or not they enter the academic sector, will be engaged in not only the creation but the dissemination of knowledge, the skills acquired in learning how to teach will be fundamental to their future work. Yet in far too many programs, effective teachers are produced by happenstance rather than by design. Graduate students often teach too much but are not sufficiently assisted in becoming effective teachers; we find this both ironic and unacceptable.

The primary reason why graduate students should teach is to prepare them to be effective teachers. Graduate students constitute an appropriate and important component of the teaching personnel of research universities, but far too many departments have become dependent on graduate students to meet their teaching requirements. Because departments have financial and other incentives for maintaining a heavy use of graduate students as teachers, graduate students often become caught in a financial vice, with teaching as their sole source of support. Extreme examples, reported from several campuses, include creating new undergraduate course sections, not because they make good educational sense but because they provide convenient financial support for graduate students.

We believe that excessive teaching is a major contributor to prolonged time-to-degree. It is unlikely that any true educational purpose is served by teaching more than three years as a graduate student. Other sources of support should be sought for students who have reached this limit.

At the other extreme are students who teach too little or not at all. A student who has sufficient financial support from fellowships, research assistantships, or other sources may do no teaching during his or her entire doctoral program unless it is specifically required.

The issue, here as elsewhere, is one of balance: some students may need to teach more than is necessary for pedagogical reasons in order to generate needed financial support; some students planning nonacademic careers may teach little. We recognize that teaching can have a powerfully reinforcing influence on a student's commitment to completing the doctorate. On balance, we are strongly committed to two objectives: first, that all students should do some teaching; second, that no students should substantially extend their completion times by teaching.

Recommendations

- Departments and programs should assure that their graduate students receive instruction in teaching methods, with assessments and feedback on teaching performance and, if possible, with a progression of increasingly advanced teaching experiences including significant in-class teaching.
- Departments and programs which do not require teaching should review the objectives of their graduate programs and seriously ask themselves why some teaching should not be required of all students.
- Universities should limit the number of terms graduate students are permitted to teach; other sources of support should be sought for students who have reached that limit.
- Course sections should never be offered when the principal justification is to provide financial support for graduate students.

Research

Problems

Graduate students form an integral part of the academic research enterprise, conducting a large portion of university research and infusing it with fresh energy and creativity. But the principal purpose of graduate student research remains pedagogical: graduate students need to learn how to perform research, demonstrate that ability in their dissertations, and then move on. In the natural sciences and engineering, research assistantships provide graduate students simultaneously with financial support and with research experience as apprentices to faculty investigators. Such support falls short of its potential when research assistants continue to be used as low-level assistants—thereby failing to acquire increasing experience in research methodology—or are obliged to work in areas far removed from their own emerging areas of interest.

We know of instances where faculty investigators have prolonged the time graduate students have spent in their laboratories chiefly because of their value to the faculty member's research. In other cases, a graduate student may seek extended research work in order to learn new techniques or generate more publications. However, students are almost always better off expanding their research expertise as faculty and nonacademic professionals after having received their doctorates rather than prolonging their apprenticeships as graduate students.

In the humanities and the humanistically oriented social sciences, as currently practiced, the major problems are twofold: the absence of mechanisms (owing to different traditions and patterns of research) for involving graduate students early and often as active participants in research, and the absence of financial support for the research they do perform. The time-to-degree in the natural sciences is consistently shorter than in the humanities and related social sciences. Where the data are available, attrition rates are shown to be significantly lower in

the natural sciences as well.⁴ There is strong reason to believe that the collaborative research model that characterizes faculty-student relationships in the sciences is a key factor in the generally more efficient doctoral programs in those disciplines.

Dissertation: For most doctoral students, the preparation of the dissertation constitutes the most critical period in doctoral education, the period most difficult to initiate and to complete. The two principal problems with dissertation work are first, the difficulty many students—particularly in the humanities and social sciences—have in developing a dissertation topic, and second, the excessive scope of some projects.

We suspect that the increasing complexity of academic subfields may be largely responsible for the first problem, and that the recent sluggishness of academic labor markets (when an exceptionally comprehensive thesis is seen as indispensable in competing successfully for available positions) contributes significantly to the second. But conditions have changed, and we believe it is time to reaffirm that the primary purpose of the dissertation is to demonstrate a student's capacity for independent work; it need not go beyond that demonstration.⁵

Postdoctoral fellowships: Postdoctoral work is a rapidly growing dimension of the academic environment that is not well organized on most campuses. Although postdoctoral appointments occur primarily in the sciences, they are increasing in the social sciences and humanities as well. It is unclear to what extent this increase reflects the growing complexity of research and the concomitant need for more research training, the need for a "holding pattern" in

the tight job markets that continue to exist in many fields, or the desire to increase one's publication record to improve employment prospects.

There is enormous variation by field in the proportion of doctorate recipients who pursue postdoctoral training and in the role that training plays in the professional education of persons entering a discipline. In some disciplines, postdoctoral work is limited primarily to individual requirements for additional specialized training. In other fields, the growing array and complexity of research techniques has made postdoctoral work an almost essential component of advanced education for most students, so much so that it might reasonably be included in computing the time-to-degree.

At their best, postdoctoral fellowships provide a valuable opportunity for students to expand their research skills, and the presence of postdocs in research laboratories is beneficial to faculty and graduate students alike. However, the increasing frequency of postdoctoral appointments (postdocs are often taken successively at two different institutions) may in some cases have the unintended effect of diminishing the significance of the dissertation as a demonstration of appropriately broad research capability and thereby of extending doctoral education unnecessarily into postdoctoral work.

Although conclusive data are not presently available, colleagues on some campuses express concern that faculty investigators are supporting postdoctoral fellows rather than graduate research assistants on research grants because postdocs may be less costly, have more advanced skills, and can devote more time to research. We urge that faculty and administrators examine the roles of postdoctoral fellows and graduate students in their departments and programs to provide assurance that both groups are appropriately integrated into the institution's research and educational functions.

4. Where comparisons have been undertaken, time-to-degree and attrition are found to vary in similar ways.

5. Recognizing the critical—and changing—role of the dissertation, the Council of Graduate Schools has conducted a major study, *The Role and Nature of the Doctoral Dissertation*, which we commend to university faculty and administrators.

Recommendations

- Graduate students should be encouraged to begin early to learn the research and scholarly techniques of their discipline and to begin preparing for and carrying out dissertation research as early as possible; faculty should not permit students' research to prolong unnecessarily the time-to-degree.
- Research assistantships should maintain a dual purpose of supporting the conduct of research and of providing students with instruction and financial support.
- Departments and interdisciplinary programs in the humanities and related disciplines should develop ways for faculty to involve their students actively and early in research projects or comparable initiatives that will provide apprenticeship research training analogous to that provided in natural science and engineering fields.
- Departments and programs should develop mechanisms such as research seminars, laboratory work, and student-advisor consultations that lead to the timely development of dissertation topics.

- Advisors must assume more responsibility in certifying that the dissertation topic is a realistic project that can be completed in a reasonable period of time; departments may wish to consider establishing a recommended upper limit to the length of the dissertation; in those cases where a dissertation of exceptional scope is being considered, the advisors should make certain that the student is making a fully informed choice.

- Universities and departments should make every effort to assure that students have sufficient financial support to permit full-time attention to their dissertations once the work is in its final phase.
- Departments should consider organizing seminars or other appropriate group discussions which provide feedback to students working on their dissertations.
- Graduate schools should work with departments and programs to develop effective procedures for monitoring the progress of students working on their dissertations; this might be accomplished by use of progress reports during the dissertation stage, generated by or shared with the student, which could be submitted annually by the faculty advisor to the Department Chair and forwarded to the Dean of the Graduate School.
- University administrators should review the number and use of postdoctoral fellows to assure their effective incorporation into the missions of the university.

Faculty Teaching and Mentoring

Problems

In addition to formal teaching, advice and support from faculty mentors are critical to students' success in their doctoral programs. While this observation is scarcely novel, current features in the university environment make its reaffirmation extremely important. Teaching of graduate students ranges from formal classroom instruction

to individualized mentoring. Graduate student mentoring is often a "hidden" effort, usually unreported and uncoun­ted in official assignments of faculty duties. Given the competitive pressures for sponsored research funding; given new commitments to undergraduate teaching; given the increased opportunity for interdisciplinary research and the demands which this imposes; given, finally, the increased opportunities for faculty leave time available for guiding graduate students is often inadequate. As a result, effective faculty advising frequently occurs only at the initiative of unusually conscientious professors or persistent students rather than as a central component of regularly recurring faculty responsibilities. To restore balance and to guarantee sustained and predictable advising, we believe that departments should designate faculty advisors for all graduate students and should assure the maintenance of advising during scheduled faculty absences. Beyond the specific student-advisor relationship, faculty advising in the broader sense is properly the responsibility of all the graduate faculty with whom a student works.

In addition to advising students on the core activities of their graduate programs, faculty should, through both formal seminars and informal advising, instruct students in the broader issues of professional responsibility and ethical behavior in teaching, research, and scholarship.⁶

Recommendations

- Departments should establish explicit expectations and enforce explicit requirements for those faculty who advise graduate students.

6. For an excellent discussion of good practice in the relationship between graduate students and their research supervisors, see *Research Student and Supervisor*, published by the Council of Graduate Schools (One Dupont Circle, N.W., Suite 430, Washington, D.C. 20036-1173).

- All graduate students should have a designated faculty advisor at all stages of their programs and should be made aware of the importance of a careful choice of the dissertation advisor.
- Institutions and departments should recognize and appropriately reward the full range of faculty teaching and advising of graduate students.
- The schedule of anticipated faculty leaves and absences should be publicized within the graduate student community and departments should assure the continuity of advising during absences as well as a known schedule for the teaching of "key" graduate courses.

Faculty advisors should assist students to:

- select coursework that matches the students' needs and interests, and recognize that curricular options which broaden academic experience may also extend the length of graduate programs;
- participate early in seminars, laboratory work, or other activities that engage students in research and assist them in the expeditious development of dissertation topics;
- define dissertation topics of realistic scope that can demonstrate a student's ability to make independent contributions to the field without encouraging projects of excessive magnitude, requiring several years to complete;
- develop a clear sense of professional responsibility and ethical standards of conduct in teaching, research, and scholarship.

that all students receive the breadth of learning necessary for a comprehensive grasp of the discipline.

- Students should be adequately advised about preparation for qualifying examinations; the examinations should not be so open-ended that students are driven into excessive coursework in preparation for them.

Curriculum

Problems

We believe that in many cases the content, shape, and focus of the graduate curriculum warrant fresh examination. The cumulative effects of curricular changes through simple accretion are a poorly integrated set of courses and a proliferation of requirements. The emergence of new and specialized subfields can undermine faculty agreement as to what constitutes the essential, substantive basis of many disciplines and lead to an accumulation of new "options" in graduate study. If unchecked by faculty counsel and departmental guidelines, students can postpone their advancement to candidacy through excessive coursework or through a real or perceived need to demonstrate mastery of several subfields.

At the same time, curricular requirements should have sufficient breadth that all students emerging from the program are well versed in the fundamental aspects of the discipline necessary for both teaching and research.

Recommendations

- New courses should be appropriately integrated rather than simply added to the existing curriculum; where possible, new courses and seminars should displace other components of the curriculum. The addition of new courses and the emergence of new subfields will require periodic redefinition by the faculty of what constitutes the coherent core of the discipline.
- Course requirements should provide sufficient flexibility to match coursework to expected career paths while assuring

Evaluating Student Progress and Performance

Problems

We recognize that selecting students who have the ability, motivation, and discipline to complete doctoral programs is a difficult, inexact, and often highly subjective process. The objectives of doctoral education—mastery of a field and the ability to make independent contributions to it—require the development of aptitudes that cannot be directly evaluated by prior activities or accurately predicted by quantitative indicators.

Because of the difficulties of selection, it is imperative that doctoral programs evaluate students' progress, identify those students who show make other career choices, and help students who are experiencing correctable problems. When attrition occurs unnecessarily, students have been mistreated. When attrition occurs unnecessarily deep into a program, students, faculty, and institutions are expending resources to little or no good purpose.

We believe that early and effective assessments of student performance and periodic monitoring throughout doctoral programs can be valuable tools for improving those programs and student performance

in them. However, we do not intend to advocate the development of yet another set of reports that contribute to the accumulation of paper but not to the improvement of education. Institutions and departments should design assessment procedures that best fit their circumstances. In some cases, an annual self-evaluation by students with an accompanying comment by the faculty advisor may be desirable; in other cases, it may be preferable for faculty to prepare evaluations. What we recommend is the development of forms of assessment that will produce meaningful information which will be used to good effect while minimizing bureaucratic intrusiveness on faculty and students.

Both fairness and efficacy require that evaluation procedures be accompanied by well-publicized expectations for student performance, grounds for dismissal, and procedures for appeal. Students who are being evaluated have a right to know in advance what is expected of them and how to challenge the judgments made of them.

Departments also should gather and make available data on actual performance and should adopt procedures to bring actual and expected standards into accord; if a program's announced time-to-degree is four years and the actual lapsed time is seven years, the program has created false advertising that undermines student performance and faculty expectations.

Recommendations

- Departments should develop and publicize, along with curricular requirements, realistic expectations for performance, including norms for time-to-candidacy and time-to-degree.
- Departments should require a written assessment of performance at the end of a student's first year, and should conduct an annual review or some other form of formal evaluation of progress throughout the student's program; such assessments might be prepared by students or their advisors

but should be shared with both; appropriate actions should be taken on the basis of these assessments to bring actual and expected performance into accord.

- Universities should have explicit, well-publicized dismissal and appeal procedures.

Postscript: Funding for Doctoral Study

Although the purpose of this paper has been to recommend improvements in institutional policies, we would be remiss not to point out the critical role of financial support for students pursuing doctoral degrees. Particularly in the face of the projected shortages of Ph.D.s and the need to increase substantially their numbers, the provision of adequate, reliable financial support is necessary to attract talented students—who have many other career options available to them—into doctoral programs. The form such support takes can have a profound effect on students' progress through their programs. Students who lack subsidized support in the form of fellowships, traineeships, and teaching and research assistantships must rely on loans, work, or personal finances to pay for their education. A heavy reliance on loans is inappropriate for students who are adults (often with dependents), who frequently are already burdened with indebtedness from undergraduate loans, and who are embarking on extended courses of study at a point when most college graduates begin regular employment. Students who must rely on work outside their academic program as their primary means of support will almost unavoidably extend their times-to-degree. Excessive reliance on teaching assistantships for financial support also may extend completion times. Recent data indicate that, of those who complete their dissertations, students supported on fellowships, traineeships, and research assistantships have the shortest

times-to-degree. Students supported on teaching assistantships take longer to complete their degrees, and students supported by loans and personal income have the longest times-to-degree.⁷

Clearly, some combination of grants and assistantships which include teaching would provide optimal support over the course of doctoral study; a careful analysis is needed to identify the optimal combinations by field. Nevertheless, doctoral study in virtually all disciplines is underfunded, and we strongly endorse the recommendations for expanded federal support for doctoral study made by AAU and other organizations and individuals.⁸ Although we recognize the financial constraints on universities, we also urge university administrators to increase support of doctoral study, particularly at such critical junctures as the dissertation stage.

Conclusion

Universities which have carried out comparative assessments of doctoral programs have found that departments with well-structured programs, clear expectations of graduate student performance and faculty responsibilities, and widely shared faculty commitments to encouraging and facilitating students' progress have lower attrition rates and shorter times-to-degree than comparable departments whose

7. National Research Council, *Summary Report 1987—Doctorate Recipients from United States Universities* (Washington, D.C.: National Academy Press, 1987).

8. The AAU position paper, "The Ph.D. Shortage: The Federal Role," calls for a doubling of the number of predoctoral fellowships and traineeships, increased support through research assistantships, and expanded incentives for underrepresented minorities and women. Aikinson (*op. cit.*) calls for a new National Program for Graduate Study awarding 3,000 new four-year traineeships annually for a steady-state program of 12,000 new and continuing traineeships. The National Association of State Universities and Land-Grant Colleges has developed a proposal for 1,000 new four-year engineering traineeships for a steady-state program of 4,000 new and continuing traineeships.

programs lack those properties. We believe the recommendations presented here identify actions which can improve the universities' collective performance.

We recognize, however, that policy changes alone are insufficient; the commitment to implement them is crucial. We hope that presidents and chancellors, graduate deans, and other administrators will work with departments, programs, and faculty on each campus to translate these recommendations into effective procedures in the ways most appropriate to their institutional settings. To do so will require a serious commitment by all those in universities who are responsible for the administration and delivery of graduate education. University, departmental, and program administrators need to develop appropriate incentives which reward strong faculty performance in doctoral education. A concerted effort by all universities will improve the effectiveness of individual programs and will strengthen Ph.D. production nationwide.

**CGS TASK FORCE ON
THE ROLE AND NATURE OF THE DOCTORAL DISSERTATION**

**Russell G. Hamilton (Chair)
Vanderbilt University**

**Elizabeth Baranger
University of Pittsburgh**

**Alison P. Casarett
Cornell University**

**Frances Degen Horowitz
University of Kansas**

**Roy A. Koenigsknecht
The Ohio State University**

**Francis L. Lawrence
Tulane University**

**Gordon MacLachlan
McGill University, Montreal**

**Frank E. Perkins
Massachusetts Institute of Technology**

**Elizabeth C. Traugott
Stanford University**

**Kay Hancock, Task Force Staff
Vanderbilt University**

**Edna M. Khalil
CGS Editor**

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Table of Contents

Foreword	i
Introduction	1
Recommendations	4
Findings	7
Distinguishing Characteristics of Dissertation Research and Dissertations	7
Originality, Significance, Independence: Defining the Terms	9
Collaboration	11
Content and Form of the Dissertation	13
Publishability	17
Intensive (Full-Time) Participation in Doctoral Research	18
Time to Completion of the Dissertation	19
Guidance for Dissertation Advisers	24
Dissertation Defense	30
Expert Advice, Editorial Help	32
Looking to the Future: Changing Research Topics or Methods	32
Conclusion	34
References	36
Appendix A	37
Working Paper for the CGS Study of The Role and Nature of the Doctoral Dissertation	37
Appendix B	44
Participating Institutions	44

Recommendations

Role of the Dissertation and Dissertation Research

> > The doctoral dissertation should (1) reveal the student's ability to analyze, interpret, and synthesize information; (2) demonstrate the student's knowledge of the literature relating to the project or at least acknowledge prior scholarship on which the dissertation is built; (3) describe the methods and procedures used; (4) present results in a sequential and logical manner; and (5) display the student's ability to discuss fully and coherently the meaning of the results. In the sciences the work must be described in sufficient detail to permit an independent investigator to replicate the results.

> > The dissertation is the beginning of one's scholarly work, not its culmination. Dissertation research should provide students with hands-on, directed experience in the primary research methods of the discipline, and should prepare students for the type of research/scholarship that will be expected of them after they receive the Ph.D. degree.

Relationship to Course Work

> > Scholarly activity and research should be encouraged from the outset of a student's graduate program, not introduced at an advanced point in the student's career. Involvement at early stages in a research program facilitates intensive participation and rapid progress and is characteristic of the physical and biological sciences, engineering, and, to some extent, the behavioral sciences.

The Dissertation as a Report of Scholarship or Research

> > Differences among the disciplines--Disciplinary diversity affects the dissertation process and product. Any set of university-wide standards and requirements must acknowledge and accommodate the differences in how scholars in different disciplines conduct their work and how this diversity is reflected in expectations for the Ph.D. dissertation.

> > The question of originality--In its most general sense, "original" describes research that has not been done previously or that creates new knowledge. Although a dissertation should not duplicate another researcher's or scholar's work, the topic, project, or approach taken need not be solely that of the graduate student. An adviser or other faculty member should encourage a student to explore a particular topic or project with the idea that the student himself or herself will independently develop

the "thesis" of the dissertation. The student should be able to demonstrate what portion of the research or scholarship represents his or her own thinking.

> > The question of collaboration--In those disciplines where doctoral research efforts are typically part of a larger collaborative project, it is crucial that an individual student's contribution be precisely delineated. Whether the collaboration is between faculty and student or among students, Ph.D. candidates are expected to be able to demonstrate the uniqueness of their own contributions and to define what part of the larger work represents their own ideas and individual efforts.

Form of the Dissertation

> > Although the "traditional" dissertation as a unified work with an introduction that states an objective, a literature review, a presentation of the methodology or procedures to be used, and a concluding discussion of results should be respected, flexibility with respect to form also should be permitted. Some disciplines, mainly in the sciences, already permit inclusion in the dissertation of research papers or scholarly articles published by the student. This practice should be adopted more frequently by the humanities and social sciences. Whatever the discipline, the published work must be logically connected and integrated into the dissertation in a coherent manner. Binding reprints or collections of publications together is not acceptable as a dissertation in either format or concept.

Adviser-Advisee Relationship

> > One of the most important contributions an adviser can make, both to reducing the time spent in the process and to facilitating completion of the dissertation, is to help students select manageable topics and to discourage them from undertaking that which is too broad in scope to complete in a reasonable and timely fashion.

> > In those cases where graduate students' research is enmeshed in their advisers' projects, clear, written understandings should be formulated at the outset about respective rights to the data generated and other intellectual products.

> > Dissertation advisers should themselves be actively involved in advanced research and scholarship and in the graduate programs of their institutions.

> > New doctoral students should be advised to meet all prospective dissertation advisers and talk with other students in the program about the attributes of various advisers. To facilitate this practice, departments should provide students with (1) an annually updated list of graduate students with their dissertation topics and the names of their advisers, and (2) a similar list of departmental members of the graduate faculty with information about their areas of research, selected references to their publications, and indication of their availability to supervise dissertations.

Administrative and Faculty Support

> > Faculties are strongly encouraged to prepare handbooks for dissertation directors and students that codify what the discipline expects of graduate education, in general, and the dissertation, in particular. Guidelines should focus on the mutual responsibilities of advisers and students and should include targets for the periods of time needed to complete each major stage in doctoral studies: i.e., course work, master's thesis (where applicable), qualifying examinations, dissertation prospectus, and completed and defended dissertation.

> > Departments and programs should review periodically the expectations of their disciplines with respect to Ph.D. education, and they should relate the role of the dissertation to those expectations.

> > Graduate schools should require every department to do at least an annual review of each student's progress on the dissertation and to share that appraisal with the student.

> > Graduate schools should collect and make available data on how long students take to complete their dissertations and degrees in each department.