



Women Leaving Science

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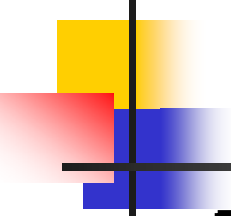
Is Female Exit a Problem?



- Female exit is high in an absolute sense and it is increasing.
- Female exit is high relative to male exit.
- Female exit from the natural sciences is high relative to female exit from the social sciences.

Occupational Exit Rates from the Natural Sciences

(% of initial workforce who have left by end of period)



	1980s-NSF (7 years)	1980s- University (12 years)	1990s-NSF (6 years)
All Females	17.4	28.2	29.1
All Males	8.7	14.3	19.2
Female PhD	3.7	7.4	18.8
Male PhD	4.1	8.7	14.2



What Factors Influence Female Exit? Econometric Analysis

- Personal Characteristics
 - Education, Salary
- Field Characteristics
 - Changing body of knowledge, growth in salary
- Family Characteristics
 - Marriage, children



Why Do Women Leave?

University Surveys and Interviews

- Most Prominent Reasons behind Female Exit
 - Discontent with Science
 - Lack of Mentoring
 - Family Responsibilities
- Most Prominent Reason behind Male Exit
 - Earnings and Opportunity



Discontent with Science

- Narrowness of science
 - Work itself is narrow.
 - Those who succeed are narrow.
- Lack of Connections
 - Personal connections are absent.
 - Substance of work does not connect with issues of import to these women.
- Women leaving for this reason often enter occupations with a nurturing component



Lack of Mentoring

- Mentoring of women in universities is much lower than mentoring of men
- Mentoring of women in the workplace (industry or government) is similar to mentoring of men
- Short-term impacts of mentoring are much higher for women than for men

Mentoring Statistics by Sex

(Interview Sample: n=102)

	Women	Men
% with mentor as an undergraduate	13.5	40.0
% with mentor as a graduate student	20.5	65.7
Effect of mentoring on probability of graduating	Increases from 0.6 to 1.0	No change
% with mentor in early employment	52	51
Effect of mentoring on probability of successful employment outcome	Increases from 0.5 to 1.0	Increases from 0.7 to 0.8



Family Responsibilities

- Women are twice as likely as men to marry professional spouses, to have a spouse who works full time and to sacrifice work for spouse
- Women do twice as much housework and 3-4 times as much childcare as their spouses



Family Responsibilities by Sex

(University survey-sample sizes in parentheses)

	Women	Men
% of Household Chores spouse is responsible for	34.8 (649)	65.1 (479)
% of Child Care spouse is responsible for	15.1 (449)	67.0 (363)
% of Child Care individual is responsible for	60.2 (449)	17.6 (363)



Difficulties balancing work and family change with career

- Women with PhDs had trouble finding acceptable jobs in the framework of a dual career couple
 - Every married PhD woman in the interview sample constrained her job search geographically to be near her husband
- Women with BS or MS degrees found child bearing and raising in conflict with jobs in industry or government



Earnings and Opportunity

- Female scientists earn 15-20% lower earnings than male counterparts
- They perceive lost opportunities because of sex generally and child-bearing specifically
- They do not see exit as a way to improve salary and opportunity
- Data confirm that women who leave science experience lower lifetime earnings than those who stay



Conclusion

- Women leave science as a result of widespread alienation.
 - Exit lessens social and private returns to scientific education
- Workplace Policies to Improve Retention
 - Training and retraining programs
 - Exploring alternatives to the high mobility early career path of PhD's
 - Family friendly work options in industry and government
 - Mentoring programs
 - Progressive human resource practices -- team work and job rotation