Can Mentoring Help Female Assistant Professors? An Evaluation by Randomized Trial

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Women continue to be under-represented among tenured Economists, and gap between Economics and other fields is growing

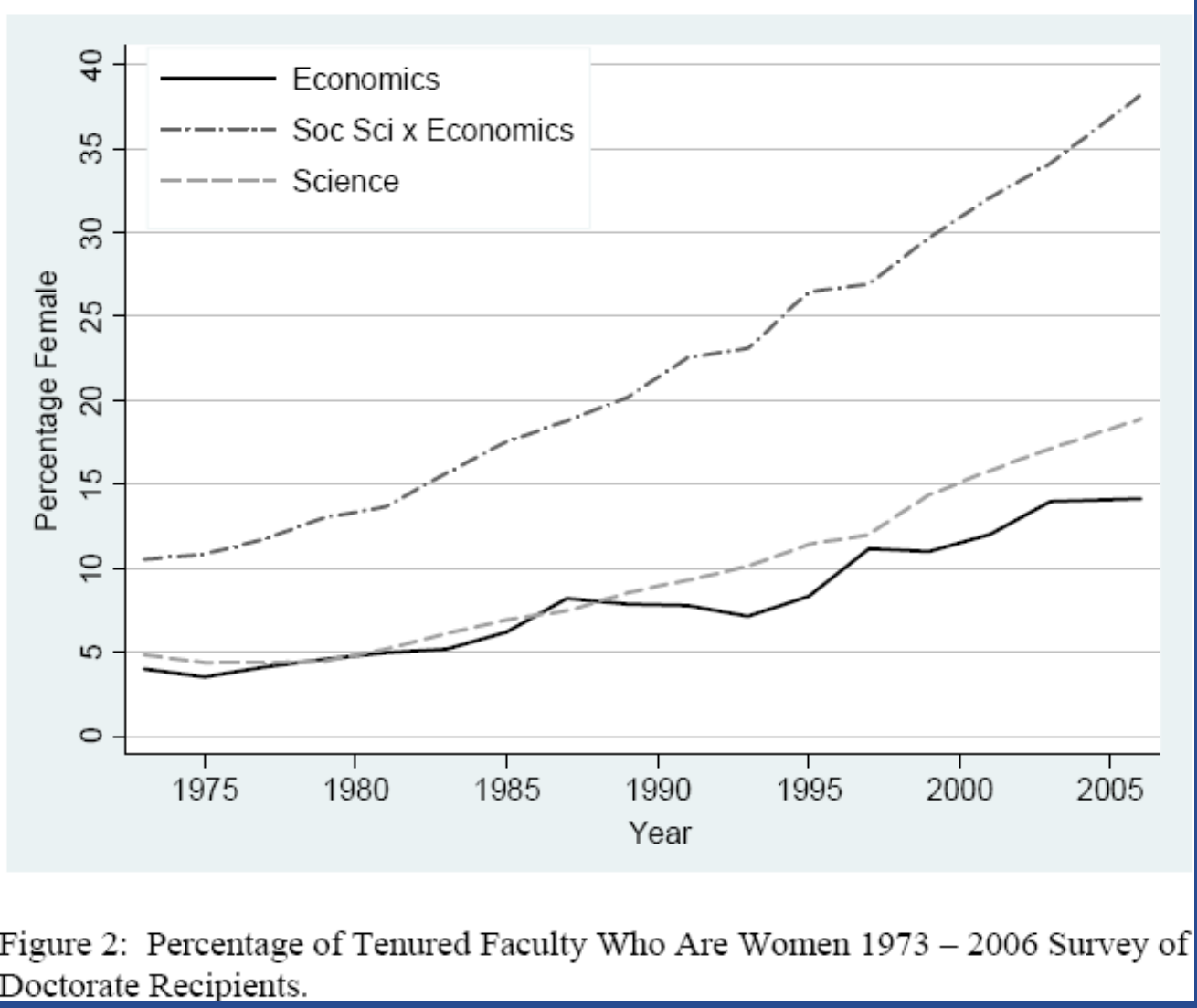

Figure 2: Percentage of Tenured Faculty Who Are Women 1973 – 2006 Survey of Doctorate Recipients.

CSWEP has been tracking female employment in economics since 1971

In 2008, CSWEP data show that:

- 35.1 percent of new PhDs in Economics were female.
- In PhD granting departments, 28.8 percent of assistant professors were female.
- But only 21.4 percent of tenured associate professors and just 8.7 percent of tenured full professors were female.
- Yet, the fraction of new PhDs in Economics has generally exceeded 25 percent since 1988.

Professor's gender may matter for student achievement

- Carrell, Page and West (2009) find that having a female professor in a mandatory standard Science, Technology, Engineering, and Math course increased the performance of female students, their probability of taking future math and science courses, and the likelihood that they graduated with a STEM degree.
- Results were strongest for students with strong math skills.
- There was little impact on the professor's gender on male students.
- These findings were based on college students who were randomly assigned to professors in mandatory standardized courses.

Similarly…

- Neumark and Gardecki (1998) find that female dissertation chairs reduce female student's time to completion and increase PhD completion rates, though they do not find any effect on the characteristics of the student's first job.

Previous literature suggests:

- Women may lack networks (e.g. McDowell, Singell and Slater (2006) find that women are less likely to coauthor)
- Women may also lack mentors (Blau, Ferber and Winkler (2006))
- The CSWEP Mentoring Program (CeMENT) was designed to address these issues

The CeMENT Intervention

- Each two day workshop was held in conjunction with the AEA meetings (in 2004, 2006, and 2008). They were aimed at research faculty.
- Workshop participants were arranged into small groups (4-5 participants with 1-2 mentors) based on their research interests.
- Each participant circulated a research paper or other related work (like a grant proposal) before the workshop. These were discussed by the small groups (~ 1 hr. for each participant).
- Plenary sessions were also held consisting of panels of the senior mentors. Topics included research and publishing, getting grants, professional exposure, teaching, the tenure process and work-life balance.

Participant Reaction was positive:

- "It was an incredible experience and I found it extremely helpful."
- "I learned a lot from the workshop and I wish I would have attended 2 years ago."
- "I had a really fantastic experience at the CeMENT workshop. So much information and networking packed into the 2 days!"
- "Although I have been teaching…for more than five years, I still found many of the discussions and much of the advice extremely helpful."

Random Assignment

- More than 80 people applied for each workshop.
- After eliminating incomplete or inappropriate applications, applicants were divided into groups by research area.
- Applicants were then randomly assigned to treatment or control status *within* each group.
- We generally selected more treatments than controls in an effort to maximize access to the program. E.g. out of 8 applicants we would select 5 treatments.
- Both controls and participants were told that we had received more applicants than we could accommodate, and that we had randomly selected participants from the pool of applicants.

Follow Up Data

- We collected vitas from treatments and controls at 1 yr (all cohorts), 3 years (2004 & 2006 cohorts) and 5 years (2004 only).
- We coded the current position, NSF and NIH grants, and publications.
- If current vitas were not available, we updated info from publicly available sources.
- Applicants were also surveyed, but attrition among the controls was a problem.

	Treatment	Control
Observations	126	91
Age	33.37 (0.332)	32.64 (0.419)
US Citizen	0.429	0.505
Married/Living with Partner	0.640	0.600
Any Children	0.240*	0.144
Years Since PhD	3.05 (0.159)	2.90 (0.191)
PhD At Top 10	0.357	0.308
Intends To Be In Academia In 10 Years	0.924*	0.978
Has Mentor	0.659	0.567
Job At Phd Granting Institution	0.754	0.747
Job At Top 10 School	0.135*	0.055
Has Mentor	0.659	0.567
Any Tier-One Publications	0.111**	0.023
Total Publications	2.94 (0.311)	2.67 (0.466)
Total NSF Grants	0.087 (0.025)	0.055 (0.024)
Total NIH Grants	0.079 (0.037)	0.077 (0.032)

Table 1: Comparison of Treatment and Control Means

Despite RA, there are some significant pre-treatment differences

Treatments were more likely to:

- have children
- have a job at a top 10 school
- have a top publication

Treatments were less likely to:

- believe that they would be in academia in 10 years.

Problem is in cohort 2

- Significant differences in children, top 10 job and top publications all arise in cohort 2.
- No significant differences in these variables in cohorts 1 and 3.
- No significant differences in belief about being in academia in 10 years in any separate cohort.

Main Results

Table II: Regression of Outcomes on Treatment (Coefficient on treatment)

		Total NSF or NIH Grants	Any Top-Tier Publications	Total Publications
1-year	All Cohorts	0.069	0.109**	0.583
		(0.084)	(0.039)	(0.652)
	Cohort 1	0.179	0.067	1.099
		(0.166)	(0.074)	(0.834)
	Cohort 2	0.117	0.194**	1.994*
		(0.112)	(0.067)	(1.024)
	Cohort 3	-0.104	0.074	-1.378
		(0.141)	(0.060)	(1.473)
3-year	Cohorts 1 & 2	0.227*	0.195**	1.850**
		(0.125)	(0.058)	(0.861)
	Cohort 1	0.320	0.171*	2.039*
		(0.210)	(0.088)	(1.145)
	Cohort 2	0.117	0.222**	1.628
		(0.112)	(0.070)	(1.312)
5-year	Cohort 1	0.398*	0.252**	2.959**
		(0.241)	(0.103)	(1.472)

Control for pre-treatment publications and top 10 school

Table III: Coefficient on Treatment for Regression of Outcomes on Treatment and Pre-Treatment Controls

		Total NSF or NIH Grants	Any Top-Tier Publications	Total Publications
1-year	All Cohorts	0.054	0.023	0.478
		(0.088)	(0.025)	(0.674)
	Cohort 1	0.151	0.011	1.032
		(0.176)	(0.053)	(0.844)
	Cohort 2	0.126	0.024*	1.898
		(0.116)	(0.013)	(1.205)
	Cohort 3	-0.117	0.011	-1.480
		(0.143)	(0.050)	(1.500)
3-year	Cohorts 1 & 2	0.179	0.090*	1.622*
		(0.136)	(0.046)	(0.890)
	Cohort 1	0.256	0.112	1.843
		(0.221)	(0.078)	(1.124)
	Cohort 2	0.126	0.058	1.414
		(0.116)	(0.037)	(1.484)
5-year	Cohort 1	0.314	0.200**	2.677*
		(0.246)	(0.097)	(1.461)

Regressions with Individual Fixed Effects

Table IV: Coefficient on Treatment from Regression of Change in Outcomes between Pre-Treatment and Indicated Year on Treatment

		Total NSF or NIH Grants	Any Top-Tier Publications	Total Publications
1-year	All Cohorts	0.039	0.016	0.308**
		(0.037)	(0.023)	(0.153)
	Cohort 1	0.045	0.037	0.531*
		(0.078)	(0.048)	(0.275)
	Cohort 2	0.072	-	0.361
		(0.075)	-	(0.275)
	Cohort 3	-	0.007	0.000
		-	(0.048)	(0.238)
3-year	Cohorts 1 & 2	0.134*	0.089**	0.795
		(0.075)	(0.042)	(0.481)
	Cohort 1	0.186	0.141*	1.471**
		(0.122)	(0.073)	(0.670)
	Cohort 2	0.072	0.028	-0.006
		(0.075)	(0.028)	(0.682)
5-year	Cohort 1	0.265*	0.226**	2.387**
		(0.158)	(0.091)	(1.055)

These are interim results

- There will be new cohorts in 2010 and 2012.
- We will be able to follow initial cohorts past the tenure hurdle.

But initial results are promising!

- Suggests that putting women in touch with other women with similar interests across institutional boundaries is helpful.
- Suggests that this type of mentoring program improves women's grant and publications records, an important step towards tenure.