Can Mentoring Help Female Assistant Professors?
An Evaluation of a Randomized Trial

Francine Blau, Cornell University

Rachel Croson, University of Texas, Dallas

Janet Currie, Columbia University

Donna K. Ginther, University of Kansas

December, 2009

JEL Codes: J4, J7, C9

Key words: Academic labor markets, Gender, Randomized trials

Acknowledgements: We are grateful to the many women who have volunteered their time to serve as mentors, and to both the participants and the "controls" in this experiment for their continued willingness to contribute to this research project. We are also indebted to the National Science Foundation (SBE-0317755) and to the American Economic Association for their support of the program and to Dan Newlon, Alice Hogan, and John Siegfried, for facilitating this program. David Munroe, Sarah Frazelle, Joshua Goodman, Christine Pal, Johannes Schmeider, and Kerry Watson provided excellent research assistance. Gwyn Loftis, and Pat Fisher provided invaluable help with implementing the workshops. The use of NSF Survey of Doctorate Recipient data does not imply NSF endorsement of the research, research methods, or conclusions contained in this report. Any errors are our own responsibility.

Abstract

While much has been written about the potential benefits of mentoring in academia, very little research documents its effectiveness. We present data from a randomized controlled trial of a mentoring program for female economists. There have now been three cohorts of participants, in 2004, 2006, and 2008. A fourth cohort will begin in January 2010 with a fifth planned for January 2012. This paper thus presents an interim assessment of the program's effects. Our results suggest that mentoring works. After five years, the 2004 treatment group (mentees) had one additional grant relative to controls, and were 17 percentage points more likely to have an NSF or NIH grant. They had 3.2 additional publications on average, and were 25 percentage points more likely to have a top-tier publication. There are significant but smaller effects at three years post-treatment in the 2004 and 2006 cohorts. While it is too early to assess the ultimate effects of mentoring on the academic careers of program participants, the results suggest that this type of mentoring may be one way to help women advance in the Economics profession and, by extension, in other male-dominated fields.

Women are extremely under-represented in science, technology, engineering, and mathematics (STEM) disciplines, as research over the decades has documented (see for example, Long 2001, Xie and Shaumann 2003, and Committee on Maximizing the Potential of Women in Academic Science and Engineering 2007). Most of these studies focus on the natural sciences (life science and physical science) and engineering (S&E). It is less well-known that the STEM discipline of economics is strikingly similar to Science and Engineering (S&E) in its low representation of women. This is illustrated in Figure 1, which shows the percentage of doctorates awarded to women between 1974 and 2006 in a number of fields using data from the Survey of Earned Doctorates. The levels and trends in the share of female doctorates in Economics closely track those in S&E (labeled Science on the figures). Female representation in both fields lies considerably below the other two fields shown in the figure: Social Science excluding Economics, and Humanities. And, while female representation increased substantially in all fields, the gap in female representation between S&E and Economics and the other fields remains substantial with no indication of convergence. In 2006, while women received 62 percent of doctorates in Social Science excluding Economics and over half (51 percent) of the doctorates in the Humanities, they received only 35 percent in S&E and 30 percent in Economics.[1]

Also of concern is the low representation of women in tenured academic positions in STEM fields, with Economics and S&E continuing to lag Social Sciences (excluding Economics), despite rising trends in female representation in all fields. The data from the Survey of Doctorate Recipients (SDR) for 1973-2006 shown in Figure 2 indicate that the gap between Economics and S&E and the other Social Sciences has increased since 1973. By 2006, women

[1] Data collected by the Committee on the Status of Women in the Economics Profession (CSWEP) shows a slightly higher figure of 33 percent for Economics in that year.

were 38 percent of tenured faculty in other Social Sciences (excluding Economics), but only 19 percent in S&E and 14 percent in Economics (see also, Ginther, 2008).

Since its inception in 1971, the Committee for the Status of Women in the Economic Profession (CSWEP) has tracked the number of women at various ranks in the profession. Its statistics indicate a "leaky pipeline" from PhD programs into tenured academic jobs. 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; however, 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.[2]

The low representation of women faculty in Economics, as well as in the STEM fields more generally, is of concern in light of recent findings by Carrell, Page and West (2009) that having a female professor in a mandatory standard STEM course increased the performance of female students in math and science classes, their probability of taking future math and science courses, and the likelihood that they graduated with a STEM degree.[3] Results were strongest for students with very strong math skills, that is, those who would be most suited to careers in STEM fields. Moreover, there was little impact on the professor's gender on male students. These results imply that improving the representation of women in academic positions in STEM fields could positively affect the future supply of women in these areas, while a lack of representation leads to a vicious circle of under supply.

The significant under-representation of women in economics at the tenured level prompted CSWEP to establish the CSWEP Mentoring Program (CeMENT) with the support of

[2] The share of tenured Associate Professors who were women in 2008 was lower at the top 10 and top 20 Ph.D. granting departments, at 16.0 and 15.1, respectively. The share of full professors who were women in these departments was roughly similar to that for all departments.

[3] These findings are based on a data set of college students who were randomly assigned to professors in these mandatory standardized courses.

the National Science Foundation's ADVANCE program and the American Economic Association. The program is aimed at assisting female junior faculty to prepare themselves for the tenure hurdle. CeMENT provides professional development and support to female economists. It has been argued (see for example Handelsman et. al., 2005) that this type of approach is likely to fail in light of institutionalized discrimination. Hence, it was by no means clear at the outset that the CeMENT program would be successful. At the time the program was founded, we designed a rigorous evaluation using a randomized trial. To our knowledge, this randomized trial is unique in the literature on mentoring in academia.

In particular, applicants to the program were randomly assigned to the treatment condition (mentees who attended the workshop) or the control condition (controls who did not receive the benefits of mentoring). Our study compares the academic performance (i.e. papers, grants, presentations) and career outcomes (i.e. promotion and tenure) of these two groups. There have now been three cohorts of program participants, in 2004, 2006, and 2008. A fourth cohort will begin in January 2010. This paper thus presents an interim assessment of the program's effects. We find that CeMENT significantly increased publication rates and successful grant applications among participants. While it is too early to tell what the eventual effect on the academic success of participants will be, the results suggest that this type of mentoring program may be a useful way to help women advance in the economics profession. We hope that it can serve as a model to address gender differences in other STEM disciplines.

I. Background

Ginther and Kahn (2004, 2009) suggests that obstacles to women's progression up the academic ladder play a role in the under-representation of women at the tenured level in economics. Using 1973-2001 data from the Survey of Doctoral Recipients, they find gender differences in promotion to tenure in economics are on the order of 21 percent. A separate analysis of a sample of American Economic Association members which includes controls for publications and citations (major productivity indicators) finds a 14 percent gap in the probability of promotion to tenure between women and men with comparable records.

Moreover, they argue that women are significantly less likely to be promoted in economics than in political science, statistics, life science, physical science and engineering. Although there are many fewer women than men in these fields, the gender gap in promotion is zero.

Two approaches have been suggested to address the under-representation of women in science. Schiebinger (2008) characterizes these as "Fix the Women" and "Fix the Institutions." The "Fix the Women" approach seeks to encourage women to study science and then provide them with the tools to succeed in a "man's world." The recent National Academies study *Beyond Bias and Barriers* takes issue with this approach, instead advocating policies designed to "Fix the Institutions" so that women's natural work cycles and experience is valued. *Beyond Bias and Barriers* (along with others including Handelsman et. al., 2005) argue that academic institutions are inherently biased against the advancement of women in science. They argue for significant changes in academic organization and culture. The NSF has attempted to facilitate such changes under its ADVANCE program for the institutional transformation of universities, colleges, and professional organizations.[4] However, the "Fix the Women" and "Fix the

[4] To that end, HR 1144, *Fulfilling the Potential of Women in Academic Science and Engineering Act*, was introduced in the 111th Congress to enact recommendations from *Beyond Bias and Barriers*. One of the key provisions of this act is to mandate gender bias training workshops for department chairs in STEM fields as well as for federal grant review panels in an attempt to fix the institutions.

Institutions" approaches are not mutually exclusive--moreover, neither has been proven by rigorous scientific evaluation to alleviate the gender gap (Ginther 2008).

The CeMENT intervention provides female economists with *research networks* and *mentoring*. Thus it is more closely aligned with the "Fix the Women" approach, as it involves giving women skills and resources to succeed in the world as it is. Below we discuss the needs and evidence for each of these components in turn.

McDowell, Singell and Slater (2006) suggest that one possible cause of women's failure to advance in economics may be a lack of *research networks*. As one indicator of limited networks, they find that in a field where co-authorship is common, female economists are less likely to coauthor than their male colleagues, even after controlling for publication rates. Thus one of the goals of the CeMENT program is the fostering of research networks for the participants. As will be discussed in more detail below, participants are placed in groups by research area, and are expected to read and comment on each others' papers both during and after the workshop. Creating these networks of scholars may alleviate the isolation often reported by female economists.

Blau, Ferber and Winkler (2006) argue that *mentoring* serves two purposes. First, it provides role models for young academics. The lack of senior women in predominantly male fields like economics can put junior women at a disadvantage. In particular, junior women may "lack adequate information about acceptable (or successful) modes of behavior… They also lack access to the knowledge acquired by older women about successful strategies for combining work roles and family responsibilities." (p. 174). Second, mentoring establishes informal relationships between young academics and those who are more senior. Blau et al. argue that women are often excluded from these relationships since "the mentor-protégé relationship is generally the result of the older individual identifying with the younger person. Male mentors may simply not identify with young women. The potential mentor may also fear that a close relationship with a young woman would be misunderstood by their colleagues or their wives." (p. 174).

However, the empirical evidence on the impact of mentors on the performance of young women is mixed.[5] One line of research examines the effect of women faculty members on the performance of female students. In economics, for example, Neumark and Gardecki (1998) find some evidence that female dissertation chairs reduce female student's time to completion and increase completion rates of the PhD, though they do not find any effect on the characteristics of the student's first job.

Several other studies provide indirect evidence about the importance of mentoring by demonstrating the effects of attaining a "critical mass" of female faculty. Tolbert, Simons, Andrews, and Rhee (1995) study sociology departments, and find that turnover rates among women first rise and then fall when the fraction female reaches 35 to 40 percent. Etzkowitz, Kemilgor, Neuschatz, Uzzi, and Alonzo (1994) also emphasize the importance of critical mass based on interview data in the sciences. To our knowledge this is the first experimental evaluation of the impact of research networks and mentoring on career success.

An earlier, one-shot, CSWEP mentoring effort was offered and evaluated in 1998. Creating Career Opportunities For Female Economists (CCOFFE) was organized by Robin Bartlett and Andrea Ziegert. The program was evaluated by asking each participant to recommend two "controls". The controls were suggested by participants as colleagues with similar training, research field, and stage of career. Participants themselves were selected on the basis of applications they submitted. Bartlett and Ziegert (2000) found that while participants

[5] See Blau et al (2010), Chapter 6, for a summary.

initially had fewer publications than controls, they outperformed them in subsequent years. Workshop participants had a higher growth rate in publications, and significantly better performance in terms of conference attendance and grants awarded. However, the choice of controls was a definitively non-random process (as evidenced by the fact that controls and participants differed systematically before the workshops began). Additionally, their study did not evaluate the impact of mentoring past the two-year mark and thus cannot provide information on the intermediate and long-term effects of mentoring on career outcomes.

II. The CeMENT Intervention

The national CeMENT intervention was based on the CCOFFE model discussed above. However, in CeMENT the participants and controls were selected by random assignment. Workshops were constructed to expose participants to role models (specifically, senior female economists), to transmit information about what it takes to get tenure, to create informal relationships between junior and senior researchers, and to build peer networks of female junior faculty working in similar research areas.

Each workshop lasted two days, and was held in conjunction with a major economics conference (the 2004, 2006, and 2008 annual American Economic Association meetings). The workshops brought together junior and senior faculty from various institutions, arranged into small groups (4-5 participants and 1-2 mentors) based on their research interests. The workshops were widely advertised and were aimed at faculty in research departments.[6]

[6] CSWEP also ran “regional” programs associated with the meetings of regional economics associations. These workshops, organized by KimMarie McGoldrick were aimed at faculty in teaching institutions, and were not evaluated using random assignment.

Each participant circulated a research paper or other related work (like a grant proposal) before the workshop. Over the course of the workshop, the small groups met to discuss and provide feedback on each participant's paper (approximately one hour for each participant). Not only did each participant get focused and intense feedback on her own work, these discussions set a norm for future interactions among the group members of reading each others' work and providing comments. Discussions about particular papers provided a jumping-off point for the senior mentors to talk about streams of research in the field, journals that might be appropriate homes for this type of work and similar issues. These sessions developed professional relationships between the junior faculty and the senior faculty, as well as among the junior faculty.

In addition to the small group meetings, plenary sessions were 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.   For each topic, three to four senior mentors served on the panel, and offered 5 to10 minutes of their thoughts. The rest of the time was spent on questions from the floor. These sessions included advice in areas where academics usually receive little formal training (e.g., how to respond to a referee report, how to network at a conference, and how to manage a particularly difficult teaching load). These sessions primarily served as vehicles for information transmission. The question-and-answer period was also useful to reassure participants that others shared their concerns and challenges.

At the end of each workshop an exit survey was distributed. On a scale of 1-7, where 1 is “not at all helpful” and 7 is “extremely helpful,” the average rating of the workshop over all three years was 6.63 In addition, after the workshops a number of participants emailed us about their experiences. Here are some excerpts from those emails:

“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.”

More than 80 people applied for each workshop. After eliminating incomplete applications, or ones that were inappropriate (because for example, the applicant’s goals did not seem to include improved research), remaining applicants were divided into groups by research area. The applicants were then randomly assigned to treatment or control status *within* each group. Note that we generally selected more treatments than controls in an effort to maximize access to the program. For example, in a group of eight, we would select five to be treatments and three to be controls. 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.

In addition to the information submitted with the initial application, treatments and controls were surveyed twice. The first time was one year after their workshop, and the second time was three years after their workshop. The schedule of follow-up surveys is shown in Appendix Table 1. Several applicants who were assigned to control status were unhappy about not being able to participate, and refused to answer follow-up surveys. In contrast, most participants not only reported positive experiences in the workshop, but were happy to assist in our follow-up surveys. Because of this selection problem, and to facilitate long-term tracking of participants, in addition to our follow-up surveys, we systematically coded data from each participant’s curriculum vita. Vitae were usually available on line from non-respondents, and many individuals who refused to answer a survey were willing to send a vita. Hence, we focus in this interim evaluation on data that has been coded from data rather than survey responses.[7]

III. Interim Results

The workshops were run in January 2004, 2006, and 2008. We thus have data on the one-year follow-up from all three workshops, the three-year follow-up from 2004 and 2006, and the five year follow-up from 2004. We begin by comparing the accomplishments and qualifications of the treatments and controls before the intervention.

a) Pre-Intervention Characteristics of treatments and controls

Table 1 shows a comparison of the "pre-intervention" characteristics of treatments and controls based on information submitted as part of the initial applications for the workshops. Means are presented for the three cohorts combined, and separately for each cohort. The first panel shows means of personal characteristics and academic background. On average, applicants were about three years from their PhDs. Half or less (43-51 percent) were U.S. citizens, and 42-48 percent obtained their BA degrees from foreign institutions. However, most applicants obtained the PhD in a U.S. school, and the majority were employed by U.S. institutions.[8] The majority of applicants identified themselves as white, though there were also substantial numbers

[7] We have also examined the survey data and attempted to place bounds on the effects of the intervention by making alternative assumptions about the missing data. Suppose, for example, that CeMENT caused all missing treatments to obtain mentors, while no missing controls obtained mentors. An estimate based on this assumption will yield an upper bound estimate of the effect of the treatment on having a mentor. A lower bound can be obtained by assuming that no missing treatments obtained mentors while all missing controls did. Unfortunately, bounds obtained in this way were too wide to allow us to make definitive statements about the qualitative effects of the intervention such as effects on having a mentor, or on having someone to discuss work with.

[8] In order to be included in the pool eligible for random assignment, the applicant needed to have a North American PhD *or* be employed at a North American research institution.

of Asian applicants and some Black and Latino applicants. A little over half were married or living with a partner, and about a fifth had children. Treatments in cohort 2 (the 2006 workshop) were significantly older, and significantly more likely to have children, while treatments in cohort 1 (the 2004 workshop) were significantly more likely to have a partner in academia. Those who were partnered stated relatively uniformly that their partner performed about 40 percent of the household work. The vast majority planned to be in academia 10 years from the time of their initial application: 92.4 percent of the treatments and 97.8 percent of the controls. This difference is significant at the 90 percent level of confidence for the three cohorts combined, though not for any of the individual cohorts.

The second panel of Table 1 compares characteristics of the positions held by treatments and controls at the time of application. Most were in academic jobs (overwhelmingly Assistant Professors), and 75% were in PhD granting institutions. The only significant difference between treatments and controls overall is in the fraction holding a job at a top 10 department.[9] The estimates by cohort show that this difference arose in cohort 2, where, by unfortunate chance, all of the applicants from top 10 departments were selected for the treatment. There is also a significant difference (in favor of the treatments) in the probability of having a mentor for cohort 1, though this does not arise overall or in the other two cohorts.

The third panel of Table 1 examines pre-treatment differences in some of the outcomes that the CeMENT program hopes to affect: publications, grants, and conferences. There are no significant differences in number of grants, conference attendance, or total number of

[9] We defined school rank using Kalaitzidakis, Mamuneas, and Stengos (2003). We used this ranking because it included non-Northamerican schools. According to this ranking, the top 10 schools are Harvard University, University of Chicago, Massachusetts Institute of Technology, Northwestern University, University of Pennsylvania, Yale University, Princeton University, Stanford University, University of California at Berkeley, and New York University.

publications before the workshops. However, overall, treatments were significantly more likely to have a publication in a top tier journal, and had more publications in top tier journals than controls at baseline. Once again, this difference arises in cohort 2, and not in the other cohorts. It appears that treatments in cohort 2 were on average older, at better ranked institutions, and more likely to have published in top journals.[10] On the other hand, they were also more likely to have had children than controls.

Given the number of cohort comparisons in Table 1, and the relatively small sample size, it is not surprising that a few should be statistically significant at the 90 or 95% level of confidence. However, these initial differences between treatments and controls must be kept in mind when interpreting the estimated effects of the treatment.

Finally, applicants were asked open-ended questions about barriers that the women themselves perceived to their success. We categorized responses into several categories including: lack of confidence, gender, family pressures, lack of a mentor, lack of a network, and time pressures or stress. Characterizing responses in this way is necessarily subjective. However, the following chart gives some examples of the responses and how they were coded.

Chart 1: Self Assessment of Major Hindrances to Career

Lack of Confidence:	"My biggest hindrances are: being fully confident that what I am studying is important, and being slow to submit my papers for review at journals. These two hindrances are related. Part of the stalling is based on my ignorance in knowing the best possible place to send my work. I don't want to aim too low but I don't want to be unrealistic either." "I believe lack of confidence in my economic training and ability is a hindrance."
Gender	"…being a young woman, I sometimes feel as though I have to try harder when presenting myself in order to be taken seriously."
Conflict with Family Life:	"The biggest hindrance is that I have two children and I cannot work the many nights and weekends that many economists do."

[10] We defined the top journals as the American Economic Review, the Journal of Political Economy, the Quarterly Journal of Economics, and Econometrica.

	"Not a very family friendly profession, especially for women."
Lack of Mentoring	"The most challenging limitation that I have confronted is the lack of mentorship with my research after completing my Ph.D. I am learning the hard way that there is a big difference between doing research for your dissertation and doing research for publication." "Sometimes I struggle to find someone to talk to for advice on things I should do to advance my tenure case (i.e. research topics, how to pitch research to be published in good journals, how to write a grant proposal, etc.)."
Lack of Networks:	"Economists are not very supportive of each other. Getting published is hard. It is hard to create the research and social environment I was used to in graduate school, no real camaraderie." "I perceive many male-dominated networks that are hard to penetrate--like the NBER. I find it difficult to meet senior colleagues outside of my institution unless we're in a structured activity."
Time Pressures:	"[I] tend to spend too much time on a project and on teaching." "24 hours a day is too short to do economic research broadly."

The last section of Table 1 indicates that relatively few women explicitly identified their gender as a barrier to success. However, responses were fairly evenly divided across the other categories. Treatments in cohort 2 were more likely to cite time pressures (consistent perhaps with their being older and more likely to have children). Treatments in cohort 3 were more likely than controls to cite family issues. These comments suggest that many young female economists feel the need for mentoring, access to networks, and help dealing with issues such as work/family conflicts.[11]

b) Baseline estimates of the treatment effect

Means of the outcome variables we focus on are shown for the controls in Table 2. These means show the baseline for comparison with the treatments. This table, and Tables 3 to 6 all follow a similar format in which results for all cohorts, and then each cohort separately are shown for 1 year, 3 years, and 5 years post intervention. Note that the sample size decreases

[11] It is unfortunate that there are no similar data on young male economists for comparison. It is possible that young male economists perceive many of the same difficulties.

with the time horizon: At three years out, only the first and second cohorts can be observed. At five years out, we only have results for the first cohort.

Table 3 shows our initial results. Each coefficient in the table is from a separate regression of an outcome (indicated by the column heading) on a constant and an indicator for whether or not the woman was in the "treatment" group. The first four rows of Table 3 suggest that one year after the treatment, the program had had little impact. This is as one would expect given delays in grant writing and publications. The main exception is that those who were in the treatment group in the second cohort have significantly more publications and more top-tier publications than the second cohort controls. However, as discussed above, the second cohort had more top-tier publications and were more likely to have a job at a top 10 department pre-treatment so it is not clear how much weight, if any, we should place on this finding.

The next three rows suggest that the intervention had an effect on publications in both Cohort 1 and Cohort 2 after three years, though the estimated effect is larger in Cohort 2. Since there was no pre-treatment difference in publications in Cohort 1, this result is encouraging. The estimates suggest that by three years after the intervention, workshop participants were 20 percentage points more likely to have a top tier publication, and had two more publications than controls.

Finally, the last row shows the results after five years for cohort 1. These estimates indicate that those in the treatment group had one additional grant relative to controls and were 17 percentage points more likely to have an NSF or NIH grant. They had 3.2 additional publications on average, and were 25 percentage points more likely to have a top tier publication. These effects are very large relative to the means for the controls shown in Table 2, suggesting that the CeMENT program increased total grants by 99 percent and the probability of an NSF or

NIH grant by 83 percent; total publications were increased by 42 percent and the probability of a top-tier publication by 172 percent. The Cohort 1 results are especially persuasive in that, as we have seen, there were no significant pre-treatment differences in the outcomes for this cohort. At five years out, this cohort is on the cusp of coming up for tenure so that it is perhaps too early to assess the ultimate effects of the treatment on women's careers. However, it is notable that despite the positive effects on productivity, there is no significant effect of the intervention on whether the woman has remained in an academic career, or on whether she has (already) been promoted to the rank of Associate Professor.

c) Alternative estimates of the treatment effect

Given the evidence in Table 1 regarding occasionally significant pre-treatment differences between treatments and controls, we have conducted a number of additional analyses to explore whether the estimated treatment effects in Table 3 are driven by pre-existing differences between treatments and controls. Table 4 shows estimates which are similar to those shown in Table 3 except that the models included controls for having a pre-treatment job at a top 10 department and for the number of pre-treatment publications in top tier journals. Adding these controls reduces the estimated effects somewhat, and there are no longer significant effects on grant activity, although all of the year 3 and year 5 estimates remain positive. We still find, however, significant effects of the treatment on the probability of having top tier publications and on the total number of publications. At year 5, treatments are 20 percentage points more likely to have a top tier publication and have 2.9 more publications overall, compared to controls; at year 3, the comparable figure is 9 percentage points and 1.6 publications.

Table 5 adopts a different tack and asks whether *changes* in outcomes between the pre-intervention and a later date are affected by the intervention. These models are equivalent to including person-specific fixed effects (since the difference in intervention status between time t and time 0 is always 1 or 0 by definition). These models yield results quite similar to those in Table 3. At year 5, we still see significant gains in grants and publications for treatments from cohort 1: Treatments were 27 percentage points more likely to have an NSF or NIH grant, and 22 percentage points more likely to have any top tier publication. At year 3, there are also significant (but smaller) effects on both outcomes for cohort 1, while cohort 2 shows an increase in the total number of top tier publications. It is conceivable that the differences at year 3 and year 5 could reflect pre-existing differences in trajectories between treatment and control members. However, if we look at the effects of the treatment after one year, they are largely insignificant, which provides some evidence that the treatments were not simply on a better trajectory to start.

Table 6 shows estimates from models that exclude applicants from top 10 departments. Since we observed pre-treatment differences between treatments and controls in the likelihood of being at such a highly-rated department, excluding these participants will make our tests more stringent. Additionally, it is possible that that the effects of mentoring are different for people in lower ranked departments. It is possible, for example, that women who are hired in top 10 departments already have mentors and networks that helped them to obtain these jobs. Table 6 shows that in fact, the CeMENT treatment effects are quite similar for the subset of women who are not in top 10 departments at application. Appendix Table 2 presents a similar exercise excluding women who obtained their PhD at a top 10 department. This restriction reduces the sample size by one third which results in higher standard errors. However, we still find positive effects on grant activity and publications after three years and after five years in this subsample.

IV. Conclusions

This paper presents interim results from a study of the CeMENT mentoring program. We used random assignment to allocate applicants to the treatment and control groups; treatments attended the mentoring workshops while controls did not. We compare performance of treatments and controls one year, three years, and five years after the intervention.

We find consistent evidence that CeMENT increased top 10 publications and the total number of publications in treated women relative to controls. The effects are monotonic with respect to time from the intervention and robust to several specification checks designed to control for possible pre-existing differences between treatments and controls. We also find effects on grant activity, both in terms of total grants and in terms of the probability of receiving prestigious NSF or NIH grants. While publications and grants are important predictors of tenure in most research institutions, it is too early to say whether the intervention will have a significant effect on either the probability that women stay in academia, or the probability that they receive tenure.

It may be viewed as remarkable that a two day intervention consisting of introductions to other junior and senior women, helpful advice, and discussions about research could have such significant effects on important outcomes. We are unable to say precisely what aspect of the program was most effective, although anecdotal evidence based on discussions with former participants suggests that many women stayed in touch with other women whom they met through the program, and that these women became an important support network. If this networking effect is one of the primary mechanisms generating the positive effects, then it may be hard to replicate the effects of the CeMENT program within a given university with few junior women; our results suggest however that similar programs across institutions but within academic disciplines might be promising. The structure of CeMENT, and the fact that it was timed to coincide with national meetings helped to overcome the problem that, in STEM fields like Economics, women at the senior levels are scarce even nationally.

Finally, while we find persuasive evidence that the CeMENT program helped to “Fix the Women,” these results do not rule out the possibility that outcomes for women in economics would be further enhanced by programs designed to “Fix the Institution.” Much like the debate between Emerson and Thoreau, we believe that both individual- and institutional-level change will be valuable in increasing the representation of women in Economics and other STEM disciplines.

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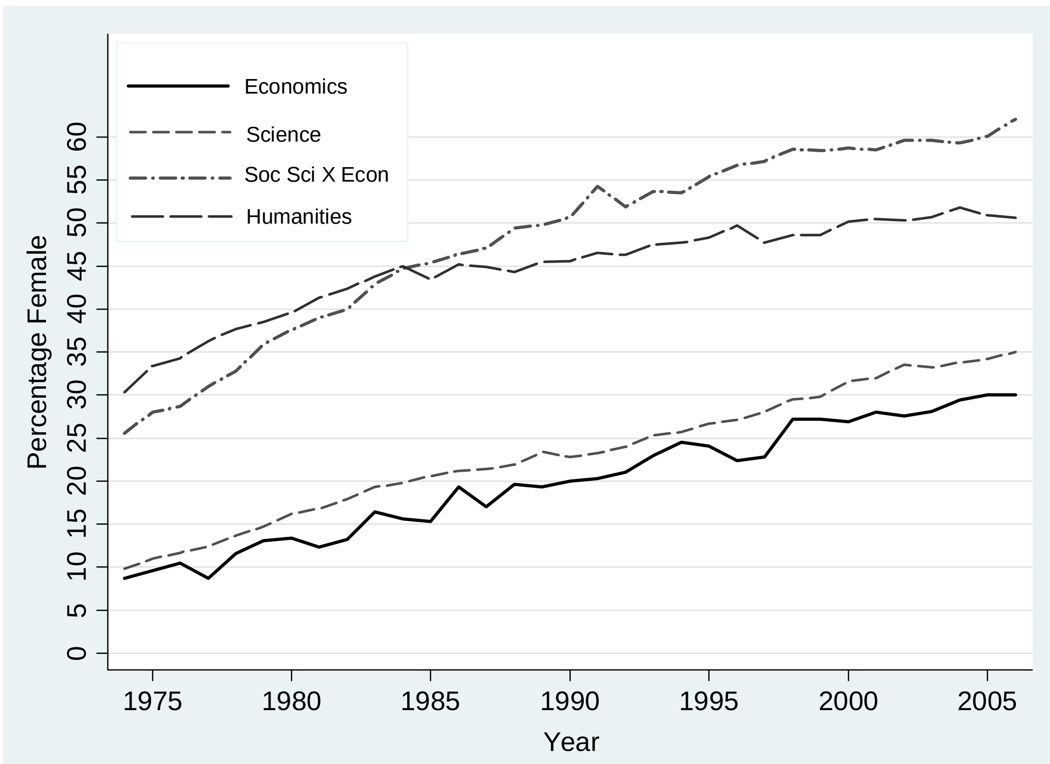

Figure 1: Percentage of Doctorates Awarded to Women 1974 – 2006 Survey of Earned Doctorates.

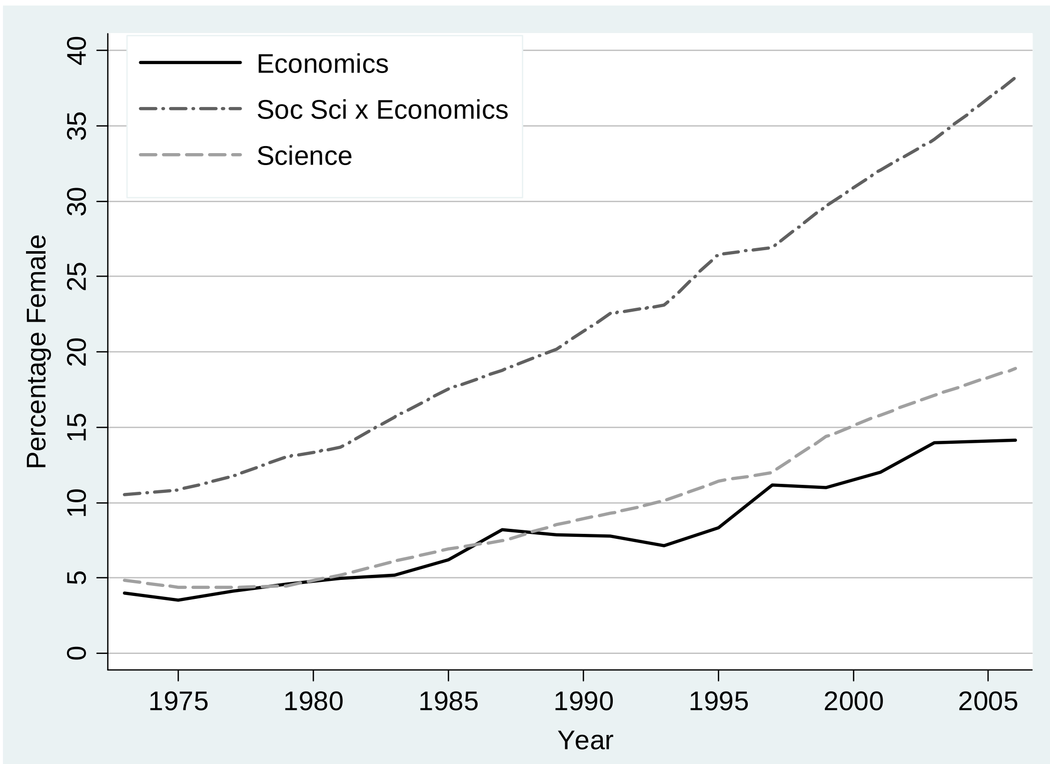

Figure 2: Percentage of Tenured Faculty Who Are Women 1973 – 2006 Survey of Doctorate Recipients.

Table 1 – Pre-treatment Means

Personal and Academic Background								
	All Observations		Cohort 1		Cohort 2		Cohort 3	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Observations	126	91	45	34	36	30	45	27
Age	33.37 (0.332)	32.64 (0.419)	35.44 (0.442)	35.61 (0.641)	34.39** (0.564)	31.83 (0.426)	30.41 (0.399)	29.93 (0.656)
White	0.653	0.602	0.644	0.588	0.694	0.643	0.628	0.577
Black	0.032	0.068	0.044	0.088	0.056	0.107	0.00	0.00
Latino	0.056	0.091	0.111	0.118	0.028	0.00	0.023*	0.154
Asian	0.258	0.239	0.200	0.206	0.222	0.250	0.349	0.269
US Citizen	0.429	0.505	0.511	0.646	0.417	0.300	0.356	0.519
Married/Living with Partner	0.640	0.600	0.667	0.618	0.722	0.552	0.545	0.630
Any Children	0.240*	0.144	0.222	0.235	0.361**	0.103	0.159	0.074
Partner's Share Of Housework	41.57 (2.20)	41.36 (2.769)	43.18 (4.110)	42.05 (4.470)	39.42 (3.154)	44.12 (4.56)	41.67 (3.89)	37.50 (5.590)
Partner Has PhD	0.553	0.464	0.606*	0.364	0.407	0.471	0.640	0.588
Partner Works In Academia	0.452	0.386	0.515**	0.227	0.385	0.471	0.440	0.500
Partner Works At Same Institution	0.262	0.175	0.242	0.091	0.269	0.176	0.280	0.278
Years Since PhD	3.05 (0.159)	2.90 (0.191)	3.29 (0.269)	3.26 (0.317)	3.22 (0.298)	2.73 (0.352)	2.67 (0.258)	2.63 (0.316)
PhD At Top 10	0.357	0.308	0.356	0.324	0.389	0.267	0.333	0.333
Phd At Non-US Institution	0.063	0.066	0.089	0.088	0.083	0.100	0.022	0.00

BA At Foreign Institution	0.476	0.418	0.422	0.324	0.533	0.500	0.511	0.407
Intends To Be In Academia In 5 Years	0.959	0.989	0.933	1.00	0.971	1.00	0.977	0.962
Intends To Be In Academia In 10 Years	0.924*	0.978	0.932	1.00	0.914	0.964	0.925	0.963
Has Mentor	0.659	0.567	0.773**	0.5	0.556	0.586	0.628	0.630
Mentor Is In Department	0.469	0.608	0.706**	0.412	0.450	0.588	0.556	0.529
Mentor Is A Woman	0.225	0.333	0.353	0.206	0.300	0.235	0.192	0.412

Current Position

	All Observations		Cohort 1		Cohort 2		Cohort 3	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Observations	126	91	45	34	36	30	45	27
Position In Econ Department	0.714	0.692	0.622	0.676	0.75	0.733	0.778	0.667
Position At Foreign Institution	0.071	0.077	0.059	0.022	0.139	0.167	0.067	0.00
Job At Phd Granting Institution	0.754	0.747	0.644	0.676	0.833	0.767	0.800	0.815
Academic Job	0.944	0.978	0.889	0.971	0.972	1.00	0.978	0.963
Post Doc	0.048	0.022	0.067	0.029	0.056	0.033	0.022	0.00
Associate Professor	0.024	0.011	0.022	0.00	0.056	0.033	0.00	0.00
Job At Top 10 School	0.135*	0.055	0.156	0.088	0.167**	0.00	0.089	0.074
Job Rank: 11-20	0.087	0.077	0.044	0.118	0.139	0.100	0.089	0.00

Job Rank: 21-50	0.135	0.121	0.067	0.088	0.083	0.167	0.244	0.111
Class Hours Per Week	5.61 (0.214)	5.75 (0.250)	5.46 (0.387)	6.12 (0.544)	5.89 (0.388)	5.71 (0.421)	5.52 (0.345)	5.38 (0.255)
Number Of Dissertation Advisees	0.516* (0.078)	0.780 (0.153)	0.356 (0.115)	0.471 (0.128)	0.556 (0.157)	0.933 (0.279)	0.644 (0.135)	1.00 (0.377)
Number Of Other Graduate Advisees	2.14 (0.392)	1.54 (0.236)	1.85 (0.654)	1.79 (0.422)	1.62 (0.486)	1.27 (0.420)	2.79 (0.779)	1.52 (0.369)
Any Coauthor	0.833	0.857	0.822	0.882	0.889	0.900	0.800	0.778
Is Coauthor Senior Faculty Member?	0.733	0.679	0.784	0.733	0.688	0.630	0.722	0.667
Is Coauthor Junior Faculty Member?	0.886	0.833	0.838	0.833	0.938	0.815	0.889	0.857
Has Mentor	0.659	0.567	0.773**	0.5	0.556	0.586	0.628	0.630
Mentor Is In Department	0.469	0.608	0.706**	0.412	0.450	0.588	0.556	0.529
Mentor Is A Woman	0.225	0.333	0.353	0.206	0.300	0.235	0.192	0.412

Outcomes

	All Observations		Cohort 1		Cohort 2		Cohort 3	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Observations	126	91	45	34	36	30	45	27
Number Of Paper Submissions	3.74 (0.260)	3.80 (0.388)	4.11 (0.505)	4.15 (0.559)	4.14 (0.368)	3.53 (0.681)	3.05 (0.425)	3.65 (0.819)
Total Top-Tier Publications	0.151** (0.045)	0.022 (0.015)	0.156 (0.095)	0.059 (0.041)	0.250** (0.092)	0.00 (0.00)	0.067 (0.038)	0.00 (0.00)
Total Second-Tier Publications	0.579 (0.094)	0.374 (0.092)	0.533 (0.170)	0.471 (0.135)	0.694 (0.214)	0.367 (0.212)	0.533 (0.108)	0.259 (0.114)
Total Third-Tier Publications	1.49 (0.219)	1.52 (0.324)	1.78 (0.342)	1.47 (0.336)	1.83 (0.566)	1.10 (0.273)	0.933 (0.223)	2.04 (0.967)

Total Fourth-Tier Publications	0.714 (0.115)	0.758 (0.160)	0.778 (0.171)	0.676 (0.173)	0.722 (0.228)	0.400 (0.149)	0.644 (0.209)	1.26 (0.458)
Any Publication	0.762	0.714	0.756	0.765	0.833*	0.633	0.711	0.741
Any Tier-One Publications	0.111**	0.023	0.089	0.059	0.194**	0.00 (0.00)	0.067	0.00
Total Publications	2.94 (0.311)	2.67 (0.466)	3.24 (0.519)	2.68 (0.481)	3.50* (0.735)	1.87 (0.414)	2.18 (0.370)	3.56 (1.37)
Number Of Grant Proposals	1.69 (0.182)	1.81 (0.249)	2.02 (0.331)	1.73 (0.273)	1.44 (0.305)	1.97 (0.594)	1.58 (0.305)	1.73 (0.406)
Federal Grant Proposals	0.250	0.272	0.341	0.364	0.222	0.173	0.182	0.269
Total NSF Grants	0.087 (0.025)	0.055 (0.024)	0.067 (0.038)	0.029 (0.029)	0.083 (0.047)	0.033 (0.033)	0.111 (0.047)	0.111 (0.062)
Total NIH Grants	0.079 (0.037)	0.077 (0.032)	0.156 (0.095)	0.059 (0.041)	0.028 (0.028)	0.033 (0.033)	0.044 (0.031)	0.148 (0.088)
Total Foundation Grants	0.206 (0.047)	0.165 (0.074)	0.222 (0.089)	0.059 (0.041)	0.139 (0.090)	0.067 (0.046)	0.244 (0.065)	0.407 (0.234)
Total Other Government Grants	0.063** (0.022)	0.275 (0.117)	0.089 (0.043)	0.059 (0.041)	0.00 (0.00)	0.400 (0.282)	0.089* (0.043)	0.407 (0.234)
Total Other Grants	0.040 (0.021)	0.055 (0.039)	0.022 (0.022)	0.059 (0.059)	0.111 (0.066)	0.100 (0.100)	0.00 (0.00)	0.00 (0.00)
Total Grants	0.476 (0.075)	0.626 (0.191)	0.556 (0.141)	0.265 (0.106)	0.361 (0.139)	0.633 (0.379)	0.489 (0.108)	1.07 (0.462)
Number Of Conferences Attended	2.71 (0.160)	2.89 (0.168)	2.43 (0.248)	2.41 (0.220)	2.57 (0.263)	3.17 (0.325)	3.09 (0.301)	3.19 (0.320)
Any Papers Submitted to a Conference?	0.857	0.923	0.844	0.882	0.778**	0.967	0.933	0.926
Number Of Conference Invites	2.35 (0.193)	2.37 (0.196)	2.17 (0.340)	2.43 (0.359)	2.55 (0.379)	1.85 (0.297)	2.37 (0.291)	2.84 (0.325)

Major Hindrances

	All Observations		Cohort 1		Cohort 2		Cohort 3	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Observations	126	91	45	34	36	30	45	27
Confidence	0.159	0.209	0.156	0.147	0.139	0.167	0.178	0.333
Family	0.135	0.088	0.133	0.147	0.139	0.100	0.133**	0
Gender	0.048	0.011	0.089	0.029	0	0	0.044	0
Time/Stress	0.151	0.088	0.133	0.118	0.222*	0.067	0.111	0.074
Mentor	0.175	0.143	0.222	0.088	0.167	0.133	0.133	0.222
Network	0.222	0.176	0.178	0.118	0.389	0.233	0.133	0.185

Notes: Sample means by treatment and control for each cohort. ** indicates that the treatment mean is significantly different from the control mean at the 5% level, * indicates a significant difference at the 10% level.

Table 2 – Means of Outcome Variables for Control Group

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	0.945** (0.024)	0.0220 (0.016)	0.187** (0.052)	0.154** (0.038)	0.791** (0.219)	0.0440** (0.022)	0.0440** (0.022)	3.308** (0.488)
	Cohort 1	0.941** (0.041)	0.000 (0.000)	0.176** (0.079)	0.147** (0.062)	0.471** (0.159)	0.0882* (0.049)	0.0882* (0.049)	3.324** (0.535)
	Cohort 2	0.967** (0.033)	0.067 (0.046)	0.133** (0.063)	0.133** (0.063)	0.867* (0.488)	0.000 (0.000)	0.000 (0.000)	2.367** (0.483)
	Cohort 3	0.926** (0.051)	0.000 (0.000)	0.259* (0.126)	0.185** (0.076)	1.111** (0.460)	0.037 (0.037)	0.037 (0.037)	4.333** (1.399)
3-year	Cohorts 1 & 2	0.920** (0.027)	0.150** (0.036)	0.210** (0.048)	0.180** (0.039)	0.870** (0.208)	0.210** (0.066)	0.120** (0.033)	5.590** (0.504)
	Cohort 1	0.912** (0.049)	0.147** (0.062)	0.235** (0.085)	0.206** (0.070)	0.882** (0.222)	0.176* (0.099)	0.118** (0.056)	5.206** (0.699)
	Cohort 2	0.967** (0.033)	0.167** (0.069)	0.133** (0.063)	0.133** (0.063)	1.000* (0.581)	0.000 (0.000)	0.000 (0.000)	4.900** (0.806)
5-year	Cohort 1	0.824** (0.066)	0.182** (0.068)	0.265** (0.097)	0.206** (0.070)	1.029** (0.269)	0.294* (0.149)	0.147** (0.062)	7.676** (0.844)

Notes: There are 34 observations or cohort 1, 30 for cohort 2 and 27 for cohort 3. Standard errors given in parentheses. ** indicates that the mean is significantly different from zero at the 5% level, * indicates significance at the 10% level.

Table 3 – Regression of Outcomes on Treatment (Coefficient on treatment)

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	-0.010 (0.033)	0.022 (0.023)	0.069 (0.084)	0.030 (0.052)	-0.117 (0.243)	0.183** (0.061)	0.109** (0.039)	0.583 (0.652)
	Cohort 1	-0.052 (0.063)	0.044 (0.031)	0.179 (0.166)	0.075 (0.088)	0.463* (0.251)	0.178 (0.127)	0.067 (0.074)	1.099 (0.834)
	Cohort 2	-0.022 (0.051)	0.017 (0.066)	0.117 (0.112)	0.061 (0.092)	-0.283 (0.529)	0.278** (0.103)	0.194** (0.067)	1.994* (1.024)
	Cohort 3	0.052 (0.056)	- -	-0.104 (0.141)	-0.052 (0.092)	-0.622 (0.471)	0.096 (0.071)	0.074 (0.060)	-1.378 (1.473)
3-year	Cohorts 1 & 2	-0.060 (0.048)	-0.020 (0.060)	0.227* (0.125)	0.097 (0.069)	0.238 (0.360)	0.348** (0.115)	0.195** (0.058)	1.850** (0.861)
	Cohort 1	-0.045 (0.071)	-0.014 (0.080)	0.320 (0.210)	0.127 (0.100)	0.651 (0.395)	0.290* (0.169)	0.171* (0.088)	2.039* (1.145)
	Cohort 2	-0.078 (0.063)	-0.028 (0.091)	0.117 (0.112)	0.061 (0.092)	-0.250 (0.631)	0.417** (0.151)	0.222** (0.070)	1.628 (1.312)
5-year	Cohort 1	0.043 (0.084)	0.085 (0.095)	0.402* (0.228)	0.172* (0.101)	1.015* (0.521)	0.439* (0.243)	0.253** (0.096)	3.212** (1.443)

Notes: Estimated treatment effect from a regression of outcome on treatment and a dummy variable for each cohort (where applicable). Robust standard errors reported in parentheses. ** indicates that the coefficient is significant at 5% level, * indicates significance at the 10% level. There are 79 observations for cohort one, 66 for cohort two, and 72 for cohort three. There is a missing estimate for associate professor since none of the cohort three respondents are associate professors at the one-year follow up.

Table 4 – Coefficient on Treatment for Regression of Outcomes on Treatment and Pre-Treatment Controls

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	-0.019 (0.035)	0.004 (0.021)	0.054 (0.088)	0.012 (0.052)	-0.163 (0.239)	0.027 (0.025)	0.023 (0.025)	0.478 (0.674)
	Cohort 1	-0.065 (0.065)	0.019 (0.020)	0.151 (0.176)	0.039 (0.085)	0.404 (0.258)	0.057 (0.055)	0.011 (0.053)	1.032 (0.844)
	Cohort 2	-0.035 (0.059)	0.004 (0.068)	0.126 (0.116)	0.075 (0.098)	-0.388 (0.520)	0.002 (0.005)	0.024* (0.013)	1.898 (1.205)
	Cohort 3	0.050 (0.057)	- -	-0.117 (0.143)	-0.067 (0.092)	-0.637 (0.475)	0.011 (0.050)	0.011 (0.050)	-1.480 (1.500)
3-year	Cohorts 1 & 2	-0.075 (0.054)	-0.059 (0.057)	0.179 (0.136)	0.058 (0.069)	0.042 (0.344)	0.088 (0.062)	0.090* (0.046)	1.622* (0.890)
	Cohort 1	-0.053 (0.078)	-0.037 (0.076)	0.256 (0.221)	0.073 (0.095)	0.477 (0.369)	0.141 (0.108)	0.112 (0.078)	1.843 (1.124)
	Cohort 2	-0.104 (0.074)	-0.088 (0.087)	0.126 (0.116)	0.075 (0.099)	-0.440 (0.624)	0.018 (0.037)	0.058 (0.037)	1.414 (1.484)
5-year	Cohort 1	0.032 (0.088)	0.074 (0.095)	0.313 (0.233)	0.113 (0.095)	0.718 (0.451)	0.215 (0.176)	0.197** (0.090)	2.860** (1.429)

Notes: Estimated treatment effect from a regression of outcome on treatment, total pre-treatment top-tier publications, having a job at a top-10 school at pre-treatment, and a dummy variable for each cohort (where applicable). Robust standard errors reported in parentheses. ** indicates that the coefficient is significant at the 5% level, * indicates significance at the 10% level. There are 79 observations for cohort one, 66 for cohort two, and 72 for cohort three. There is a missing estimate for associate professor since none of the cohort three respondents are associate professors at the one-year follow up.

Table 5 – Coefficient on Treatment for Regression of Change in Outcomes between Pre-Treatment and Indicated Year on Treatment

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	0.024 (0.024)	0.006 (0.016)	0.039 (0.037)	0.008 (0.029)	0.048 (0.069)	0.048 (0.030)	0.016 (0.023)	0.308** (0.153)
	Cohort 1	0.029 (0.043)	0.022 (0.022)	0.045 (0.078)	0.008 (0.056)	0.172 (0.138)	0.082 (0.064)	0.037 (0.048)	0.531* (0.275)
	Cohort 2	0.006 (0.043)	-0.006 (0.043)	0.072 (0.075)	0.017 (0.066)	-0.011 (0.148)	0.028 (0.028)	- -	0.361 (0.275)
	Cohort 3	0.037 (0.037)	- -	- -	- -	-0.037 (0.037)	0.030 (0.053)	0.007 (0.048)	0.000 (0.238)
3-year	Cohorts 1 & 2	-0.003 (0.040)	-0.042 (0.055)	0.134* (0.075)	0.040 (0.053)	0.205 (0.194)	0.181** (0.072)	0.089** (0.042)	0.795 (0.481)
	Cohort 1	0.037 (0.056)	-0.036 (0.078)	0.186 (0.122)	0.060 (0.080)	0.360 (0.288)	0.193 (0.118)	0.141* (0.073)	1.471** (0.670)
	Cohort 2	-0.050 (0.057)	-0.050 (0.079)	0.072 (0.075)	0.017 (0.066)	0.022 (0.250)	0.167** (0.075)	0.028 (0.028)	-0.006 (0.682)
5-year	Cohort 1	0.125 (0.079)	0.063 (0.094)	0.268* (0.148)	0.105 (0.084)	0.724* (0.428)	0.342* (0.191)	0.223** (0.086)	2.644** (1.042)

Notes: Estimated treatment effect from a regression of the change in outcomes between pre-treatment and the given year on treatment and a dummy variable for each cohort (where applicable). Robust standard errors reported in parentheses. ** indicates that the coefficient is significant at 5% level, * indicates significance at the 10% level. There are 79 observations for cohort one, 66 for cohort two, and 72 for cohort three. The missing estimates correspond to outcomes that do not change between pre-treatment and the one-year follow up.

Table 6 – Regression of Outcomes on Treatment Omitting those with Pre-Treatment Jobs at Top-Ten Schools

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	-0.016 (0.037)	0.009 (0.022)	0.070 (0.091)	0.033 (0.055)	-0.202 (0.251)	0.090 (0.058)	0.035 (0.035)	0.485 (0.718)
	Cohort 1	-0.067 (0.071)	0.026 (0.026)	0.207 (0.189)	0.082 (0.091)	0.443 (0.273)	0.140 (0.144)	0.008 (0.074)	0.925 (0.910)
	Cohort 2	-0.033 (0.057)	0.000 (0.066)	0.100 (0.112)	0.067 (0.098)	-0.433 (0.511)	0.067 (0.046)	0.067 (0.046)	1.967* (1.159)
	Cohort 3	0.056 (0.060)	- -	-0.109 (0.152)	-0.054 (0.099)	-0.688 (0.505)	0.058 (0.071)	0.033 (0.057)	-1.431 (1.591)
3-year	Cohorts 1 & 2	-0.097* (0.052)	-0.047 (0.062)	0.238* (0.139)	0.099 (0.070)	0.011 (0.344)	0.171* (0.098)	0.121** (0.054)	1.735* (0.934)
	Cohort 1	-0.093 (0.075)	-0.030 (0.087)	0.359 (0.241)	0.128 (0.100)	0.430 (0.355)	0.233 (0.178)	0.140 (0.088)	1.941 (1.228)
	Cohort 2	-0.100 (0.071)	-0.067 (0.089)	0.100 (0.112)	0.067 (0.098)	-0.467 (0.614)	0.100* (0.056)	0.100* (0.056)	1.500 (1.436)
5-year	Cohort 1	0.003 (0.090)	0.063 (0.104)	0.438* (0.255)	0.154 (0.102)	0.787 (0.484)	0.438* (0.231)	0.213** (0.099)	2.896* (1.547)

Notes: Estimated treatment effect from a regression of outcome on treatment and a dummy variable for each cohort (where applicable). Sample restricted to those women who were not working at a top-ten school at the pre-treatment. Robust standard errors reported in parentheses. ** indicates that the coefficient is significant at the 5% level, * indicates significance at the 10% level. There are 69 observations for cohort one, 60 for cohort two, and 66 for cohort three. There is a missing estimate for associate professor since none of the cohort three respondents are associate professors at the one-year follow up.

Appendix Table 1: Follow-up Survey Schedule

Cohort	Wave	Survey	Date
1 (2004)	1	Initial Application	August 2003
1 (2004)	2	First Follow-up	February 2005
1 (2004)	3	Second Follow-up	January 2007
2 (2006)	1	Initial Application	May 2005
2 (2006)	2	First Follow-up	January 2007
2 (2006)	3	Second Follow-up	January 2009
3 (2008)	1	Initial Application	August 2007
3 (2008)	2	First Follow-up	January 2009
3 (2008)	3	Second Follow-up	January 2011*

* Not yet completed at the time of this report.

Appendix Table 2 – Regression of Outcomes on Treatment Omitting those with PhDs from Top-Ten Schools

		Academic Career	Associate Professor	Total NSF or NIH Grants	Any NSF or NIH Grant	Total Grants	Total Top-Tier Publications	Any Top-Tier Publication	Total Publications
1-year	All Cohorts	0.025 (0.040)	- -	0.087 (0.058)	0.074 (0.054)	-0.190 (0.303)	0.071 (0.068)	0.022 (0.045)	0.217 (0.812)
	Cohort 1	0.009 (0.055)	- -	0.198* (0.105)	0.163* (0.088)	0.436 (0.270)	0.0765 (0.161)	-0.027 (0.092)	1.052 (0.990)
	Cohort 2	-0.046 (0.078)	- -	0.046 (0.078)	0.046 (0.078)	-0.636 (0.681)	0.091 (0.063)	0.091 (0.063)	0.909 (0.784)
	Cohort 3	0.111 (0.076)	- -	-0.000 (0.114)	0.000 (0.114)	-0.467 (0.591)	0.044 (0.092)	0.011 (0.072)	-1.411 (2.131)
3-year	Cohorts 1 & 2	-0.035 (0.058)	-0.038 (0.066)	0.160** (0.079)	0.123* (0.066)	-0.144 (0.423)	0.169 (0.125)	0.123* (0.067)	1.274 (0.887)
	Cohort 1	0.053 (0.069)	0.008 (0.097)	0.258* (0.129)	0.189* (0.104)	0.433 (0.366)	0.196 (0.225)	0.111 (0.108)	1.976 (1.286)
	Cohort 2	-0.136 (0.096)	-0.091 (0.088)	0.046 (0.078)	0.0455 (0.078)	-0.818 (0.806)	0.136* (0.075)	0.136* (0.075)	0.455 (1.204)
5-year	Cohort 1	0.096 (0.080)	0.102 (0.117)	0.327** (0.140)	0.223** (0.106)	0.553 (0.408)	0.334 (0.283)	0.145 (0.111)	3.258* (1.633)

Notes: Estimated treatment effect from a regression of outcome on treatment and a dummy variable for each cohort (where applicable). Sample restricted to those women who did not complete their PhD at a top-ten school. Robust standard errors reported in parentheses. ** indicates that the coefficient is significant at the 5% level, * indicates significance at the 10% level. There are 52 observations for cohort one, 44 for cohort two, and 48 for cohort three. There are missing estimates for associate professor since there are only two associate professors in the restricted data at the one-year follow up.