

NAVIGATING CAREER AND FAMILY PATHS

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I am not enthusiastic about the title for this panel discussion: "*Navigating Career and Family Paths*," probably because it suggests to me that this is a "self-help" workshop. Assuming that the goal of women in engineering programs in universities is to recruit and retain women in the technical professions, it is not sufficient to focus on helping/improving/changing ourselves. I do not think that either some gender-linked trait or our devotion to our families is responsible for the fact that there are so few women in engineering. Rather, the reason that more women are not engineering students, practicing professional engineers or engineering professors is discrimination, and women in engineering programs will only be successful if we focus on combating discrimination.

Personal Experience: Early Years

I am 50 years old. I have presented my own experience not as a model, but as a demonstration that there are many paths for women to enter the engineering profession and many, including mine, are not "typical." Also, I have lived through times of changing and not-always-compatible cultural roles for women throughout the 50's, 60's and 70's which may add some perspective to the discussion today. I first went to college in the 60's. In spite of all the radical questioning of conventional social arrangements, the 60's were not particularly enlightened times for women. The great social movements were male-dominated: civil rights, anti-Vietnam War, and "free-you-name-it" at campuses across the US. We women were the first of the post-war baby boom generation to enter college. Some of us came from families where our mothers didn't work outside the home; for others our mothers worked, but "in the closet" at underpaid and/or part-time jobs. In my own case, my mother was the first person in her family to graduate from high school and then went on to attend the University of California at Berkeley, where she graduated as a member of Phi Beta Kappa. She had a job during the war and then was laid off. She never returned to the workforce. As I think was typical of my high-achieving women friends at Stanford, I had the

wholehearted support of both my parents for my academic endeavors. However, we young women also suspected that socially acceptable after-college roles for women at that time didn't seem to include a challenging career outside the family. Overall, the messages for young women were confusing and inconsistent, and I remember spending a lot of time discussing career versus family, as though we had to choose one or the other.

At 21 I graduated from Stanford with a bachelors degree in Psychology and opted for neither a career nor a nuclear family. Instead I wanted to do grand, unconventional and even risky things: I joined the Peace Corps; I was a community organizer and active in political movements in San Francisco; I went to meetings and I hung out with the guys. I had no plans to marry and have children, which I saw as a constraint to my activities. Fortunately for me, the women's movement of the 1970's exploded the myth that intellectually rewarding well-paid work was a contradiction to my participation in family life (as well as the corollary that marginal, boring and low-paying jobs were somehow more compatible with family life for women). More important, a succession of depressing clerical jobs helped convince me that having a profession was better whether you had a family or not.

With the encouragement of both female and male friends, I dusted off my high school interests in math and my limited college background in science and started back to school, taking calculus and physics at the University of California at Berkeley and San Francisco State University while I was working in the Bay Area. This self-test was very successful and I went back to college full-time at the University of California at Davis in 1975 to earn a second bachelors degree in Civil Engineering. In addition to a full load of engineering courses, I worked 20 hours per week at the California Department of Water Resources. I emphasize that what was not only possible but very exciting for me in 1975 with the women's movement and my women friends encouraging me, would have required more fortitude than I had in college in 1963, when there was one woman undergraduate student in the entire College of Engineering. Also, the willingness of UC Davis to accept an older student and to help me find work was critical to my becoming an engineer. As it turned out, I liked the intellectual part of engineering so much that I went on for MS and PhD degrees at UC Davis. Overall, my seven years in school was a fantastic experience. Although I was only the second woman to get a PhD in Civil Engineering at UC Davis (1982), I did not personally experience any obvious discrimination in graduate school. Looking back, that remarkably discrimination-free education probably had to do with my maturity which allowed me to focus my academic efforts and to simultaneously ignore the social pressures that younger women students felt, and a wonderful support network of women friends which had gathered during my women's movement days in the 70's. I began a faculty job at the University of Colorado in Fall 1982 without giving discrimination at universities much thought, ignoring the ominous reality that fewer than 10% of the undergraduate engineering students at UC Davis in 1978 were women and only a handful of women had received doctorates in engineering by 1982.

Once again after college, I was naïve. As 13 years on the faculty in the College of Engineering at the University of Colorado have taught me, discrimination is alive and well here and at universities elsewhere. Susan Faludi documents that the position of women as workers in the US actually declined significantly in the 1980's, compared with the surge of women into once male-dominated jobs in the 1970's, and universities seem to have followed this trend.¹ For example at the University of Colorado, enrollment of women undergraduate students in the College of Engineering peaked in the early 1980's at approximately 24% and then declined, to as low as 16% by 1992. The number of women undergraduate students in engineering has since increased to approximately 18%, but has not yet returned to the level of the early 1980's.

Social Pressure on Women Engineers Today

The other cultural trend that seemed to reemerge in the 1980's was the concern that simultaneously having a family and an engaging profession may be extraordinarily difficult for women. Why? Well, society has retreated from explicit legal barriers to women in the professions, and I suspect that maintaining male dominance in certain careers like engineering requires subtler arguments with the result that women appear to voluntarily opt out of those professions. The cultural arguments including those below seem to be especially effective on girls and young women, leading us to:

despair that we are not as smart as men, especially about tools/technology: for example, the right-brain vs. left-brain paradigm which has been used by psychologists to suggest that perhaps women aren't good at math by nature;

fear that men won't like us socially if we are professionals: typified by the much-ballyhooed statistic reported in the popular press several years ago and later shown to be completely false, that a woman over 39 who had delayed marriage to pursue a career was more likely to be killed by a terrorist than to get married;

be guilty that having a profession makes us unable to love our families: especially evocative is the popular and pejorative description of the plight of career women who would "have it all," somehow implying that women who have careers and families are greedy, selfish, unrealistic. I note that I have never heard that expression applied to men who have both careers and families, nor to women who have to work at marginal jobs.

I would like to focus on women who are discouraged from pursuing degrees in engineering because of fear and guilt, because a significant number of women who know how smart we are drop out of engineering, as undergraduate and graduate students, and later as professionals. It has been suggested that these women are not

put off by intellectual challenge or academic competition, but rather by the negative personal stereotypes imposed on them as women engineers.²

My Experience at the University of Colorado

Since I have been on the faculty of the University of Colorado College of Engineering I have gotten married (1985) and had a son (1986). My husband is a professor at the Colorado School of Mines, and integrating two academic careers has been challenging. Having a son was a surprise and delight to us. I was 40 when Joey was born. I apparently could have taken sick leave in lieu of parental leave, which is not offered by the University. I did not on the advice of my Department Chair, who told me that it might damage my chances for tenure. I got tenure in 1989, after a skirmish with the Dean of the College who thought I should postpone the process a year. I was gratified to have the strong support of my Department, and their recommendation for tenure that year prevailed. Apparently the Dean mistakenly assumed that I had taken a year's parental leave, an assumption which he had not bothered to check with my record. I thought at the time, and still do, that this was discrimination stemming from the false stereotype that women faculty who are mothers don't work hard.

As a family we have thoroughly enjoyed our lives, including the emotional uncertainties and the practical difficulties of arranging complex and conflicting schedules, child care, etc. I must praise my husband, who is truly my partner and has been a constant source of support for me as a professional. It would be impossible to detail all his efforts here, but I do know that maintaining any kind of family life would have been a miserable task without his enthusiasm and plain hard work. However, these family arrangements are not peculiar to engineering or to university faculty. I have compared our family activities with neighbors and friends in families with children and all adults working at either professional or non-professional jobs, and our concerns and constraints seem equivalent. I confess that I have not felt a moment's guilt that my profession has interfered with my relationship with my husband or son. However, there are many times when I have noticed that I do not have much time purely for myself, as I did when I was single. For example, I used to run marathons in graduate school; now I am happy to be able to bicycle to work and on weekends.

In 1996, I can state with great pleasure that I love my work teaching and doing research in environmental engineering at the University of Colorado, and I love my nuclear family. I am especially proud of my success at mentoring women PhD students, three of whom are now professors in Civil or Environmental Engineering Departments at other universities (Colorado School of Mines, University of Kentucky and Northern Arizona University). Two others have very successful careers in international environmental engineering and sanitation, in the World Bank and the Peace Corps.

Unfortunately, the effects of gender discrimination at the University of Colorado also have been apparent during my career here, as can be seen just considering women faculty. There are 15 full-time, tenure-track women faculty in six Departments in the College of Engineering (Aerospace, Chemical, Civil/Environmental/Architectural, Electrical/Computer, and Mechanical Engineering and Computer Science) at the University of Colorado, out of a total of approximately 180 faculty. As of last year, five of us were tenured, four at the rank of full professor. That is good news; at approximately 8%, the University of Colorado has a higher fraction of women faculty in engineering than the national average. However, I am convinced that the unusually high representation of women on the faculty in the College of Engineering is a reflection of the quality of the individual women faculty, not any exceptional efforts by the College to recruit and retain women. Evidence of this are the impressive academic achievements of the women faculty here: four are recipients of prestigious NSF Presidential Young Investigator/Career Development awards and one was awarded the very competitive NSF Presidential Faculty Fellowship; three of us have received NSF awards for faculty women in science and engineering, and several are fellows of their respective professional societies.

More disturbing is evidence of discrimination problems in the College of Engineering: one lawsuit against College faculty and administrators pending for sexual harassment and retaliation brought by a woman faculty member and another women faculty who is leaving for a job in another university after serious allegations of discrimination-related mistreatment in her department. In 1991 I had the opportunity to serve on the Boulder Campus Salary Equity Committee, and I and several others were on a sub-group to evaluate gender and ethnicity-based salary discrimination in the College of Engineering. During that independent evaluation, more than one-third of the women faculty in the College received recommendations for salary increases to reverse gender-based inequities in salary. Since that Salary Equity survey, the University and the College has abandoned that independent process, additional evidence that gender-based discrimination against women faculty is at best ignored by the College of Engineering.

Women in Engineering Programs

What are difficulties faced by women in engineering programs at universities in bringing more women into the engineering career path? I have described two below, and perhaps in the forthcoming conference sessions and discussion, we will present ideas to resolve these difficulties. First, the activities of women in engineering programs I am familiar with are split between services for women students to enhance educational opportunities, provide scholarships, and increase self-esteem and advocacy, particularly to fight gender-based discrimination. In general services are more rewarding and pleasanter to provide, but I think that for women in engineering programs, services to women should not be an end in themselves, but rather serve to build a base for advocacy of efforts to end discrimination. One problem with introducing advocacy into

our activities, is that the organizational methods for confronting discrimination are few and have not been much refined since the 70's. A second very compelling concern for women in engineering program staff who may want to confront institutional discrimination in colleges of engineering is that of "biting-the-hand-that-feeds-you." Most of these programs are financially dependent on the administrators they may have to criticize, and resolving this problem will eventually require some risk-taking.

In conclusion, I return to what I stated at the beginning of this paper: that I fear that a panel discussion on "*Navigating Career and Family Paths*," may revive the old "career *versus* family" dichotomy that I remember from my college days during the 1960's, and distract us from discrimination against women in engineering. I have found that while navigating the career-plus-family path has its difficulties, they are negligible compared with the difficulties I have experienced or observed in just navigating in the career path in academic engineering. Furthermore, I stress that balancing an interesting and well-paid job with family and community life is a far pleasanter task than balancing poverty or boring low-paid work with family life. Finally, I submit that it is difficult for a family in the 1990's to thrive on a single income, so that for most women, the prospect of not working at all has severe economic consequences for her and her family. Thus I see the responsibility of women in engineering programs at universities to help women navigate their career paths in engineering *and* to make sure that "family" concerns are not used as a spurious argument to discourage women engineering students.

References

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