

The Quest for Equilibrium – Balancing a Career in Science and Engineering Academia and a Family

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Abstract

According to the Bureau of Labor Statistics, almost 64 million women, aged 16 and over are employed, representing approximately 46% of the total workforce. This number has more than doubled since 1960. In that same time period the number of workingwomen with children less than 6 years of age, has more than tripled. The number of professional women (bachelor's degrees or higher), in the civilian labor force, has increased 28% from 1992 to 1998. These numbers indicate that many women face the problems of trying to balance both a career and family. As educators, we must address that differences in gender do exist and bring the dilemmas that will face our young female students as professionals. The choice to work professionally (full-time or part-time) or to stay at home is an individual decision. Either way, these workingwomen are still full time mothers.

This paper provides findings from current studies and suggestions to mothers who want to work professionally yet seek a balance between their career and family lives. Understanding that the “super mom” theory is merely a myth, this paper will provide men and women with proven tools and experiences that will aid in their quest for both equilibrium and inner contentment as they pursue roles as mother and professional.

I. Introduction

According to the Bureau of Labor Statistics, almost 64 million women aged 16 and over are employed, representing approximately 46% of the total workforce.¹ This number has more than doubled since 1960. In that same time period the number of workingwomen with children less than 6 years of age, has more than tripled. Only in the past year has this trend changed. It's been 30 years since women started swelling the number of workers, but trying to balance career and family has not gotten any easier for working women.

In academia, specifically in the science and technology fields, the number of women who pursue fulltime, tenure-track positions relative to other fields of study are astoundingly low. Working toward tenure and simultaneously trying to start or maintain a family defines the major reason that these numbers are so low. Women need support both at home and from the colleges and universities that hire them if the trend is to be reversed.

It would be wonderful if the newborn child came with an instruction book. But that does not happen any more than a working mother can find the magic formula to make a career and motherhood compatible. Each situation is different. No two careers, family or children are alike. Therefore, the choice to work professionally either fulltime or part-time is based upon many factors. The good news is that there are alternatives for making the transition easier.

Since the nation's ability to compete in today's global markets depends strongly on products generated from research in science and technology areas, it is critical that women including mothers represent a much larger portion of these career fields. My case is not unlike that of many untenured, full-time faculty women. I have two children under the age of two and constantly battle choices between the demands of motherhood and those of an engineering teaching and advising schedule.

This article will first discuss some general considerations for working parents, and then focus on the specific needs and solutions for parents working in the science and engineering education fields.

II. A Women's Choice

The first step in achieving a balance is for the mother to make the decision to work or not to work. Careful consideration should be given to the individual's children, husband, career aspirations and goals, financial goals and the availability of support systems. Recognizing the importance of these elements and examining them will ensure that the best decision is made.

This paper assumes that the decision is to work and raise a family. At this point it's time to begin merging the two roles into a workable plan that slights neither role.

In her book, *Balancing Career & Family: Overcoming the Superwoman Syndrome*, Marion Thomas describes two categories of women who work: those who are pursuing professional careers and seek personal satisfaction in their work and those who work solely for financial reasons.

Thomas continues that women who work to pursue their career often work long hours, travel, have additional stresses associated with their job and as a result, may earn more money. These women often have more flexibility when dealing with their employers regarding their work and travel schedules. Some professional women even make the decision to forego their careers and take a less demanding job in order to spend more time with their family.²

In contrast, women who work for financial reasons typically work a set number of hours, seldom travel, and unfortunately earn less. Many of these women also pursue higher education or training to qualify for better jobs that pay more money. Working part-time or taking advantage of job-sharing options seems to be more prevalent among women working in non-professional roles.

Another option for both types of working women is to work from home. Options range from working at home one or two days per week to working from home all week. Companies now

understand that spending time at home helps employees be more productive. Thus these solutions are becoming more prevalent.

III. Critical Elements for Making It Work

After making the decision to work, focusing on five key components can make the transition as smooth as possible. These fundamentals include selecting the best possible childcare, cultivating a supportive family environment, seeking a supportive work environment, getting organized, and developing healthy personal skills.

Child Care – Working mothers should not underestimate the importance of having dependable child care. Many researchers have studied the effects of fulltime childcare on children of working parents. These studies report conflicting results depending on the interpretation of the researcher.³ Some indicate that there is little negative effect on children. Others have found that the positive outcomes outweigh the negative aspects.

If quality care is selected, the adverse effects on the child are minimal and in some cases, childcare is beneficial to the child's social and academic development.⁴ The key is being sure that the child's needs are met at each critical stage. If parents take the time to select good, competent childcare, they will have confidence in the provider and can focus on getting the job done rather than worrying whether their children are happy and safe.

Some suggestions for selection include:

- *Start looking for a childcare provider early.* As soon as a couple plans for a baby, it is time to start looking.
- *Decide whether or not private daycare or public daycare is better for the child.* If private care makes sense, ask whether the provider comes to your house or keeps the child in hers. In-home care may be much more expensive and increase the amount of wear and tear on your home. However, there are also many benefits such as having more time with children at home rather than in the car. Also children cared for at home are less disrupted. Some providers also start meals, do laundry, etc. To determine the best solution, a parent should observe children in both situations and interview the providers. Also ask for an opinion of a friend or family member who has experience with childcare. When the researching is completed, parents should sit down and make a list the pros and cons of each.
- *Perform background checks on selected candidates.* The local city office will have information on any persons living in the area. Check available sources for prior criminal records.
- *Make an appointment to interview potential candidates.* *The National Network for Child Care, The National Extension Service Children Youth and Family Educational Research Network* provides the following examples:
 - Tell me about yourself.
 - How did you decide to become a provider?
 - What do you like most about being a provider?

- How long do you plan to be one? Does your family support your business?
- Can you describe what a typical day might be like for my child?
- How do you handle emergencies?
- Do you have infant and child cardiopulmonary resuscitation (CPR) training? Do you carry liability insurance?
- Are children ever transported in a vehicle while in your care? If so, do you have a valid driver's license, appropriate child seats and what is your driving record?
- Can parents "drop in" for a visit?
- Describe the feedback I will receive about my child at the end of the day.
- How many days did parents need to use alternative care this past year?
- What are some things you hope my child will learn here?
- What would you do if you and I disagreed about something?
- How much staff turnover has there been in the past year?
- What do you want to know about me (and/or my partner and child)?
- Can you provide me with a list of references? ⁵

Ask a friend, co-worker or family member who has experience with childcare to review your list of questions.

- *Choose a back up to current childcare.* If your child gets sick or your provider temporarily shuts down (i.e. if a water pipe in the facility breaks, the provider is ill, etc.) what is your next step? Many families don't have relatives that live close, so the primary childcare may be up to mom unless other arrangements are in place.
- *Be sure the location of the provider is reasonable.* Determine whether the location should be closer to home or to work. Consider ease of pick-up and also the availability of an emergency facility.

Cultivate A Supportive Family Environment - A family support system is another critical element for balancing work and family. Having a spouse who shares in the responsibilities that are involved in the raising and caring for children is essential. The first step to ensure that the spouse is "on board" is to discuss your goals, aspirations and priorities together. The next step is to agree to share responsibilities. For example, decide in advance who is going to stay home with a sick child, make dinner each night, chauffeur active children, and clean up after meals.

Children can also participate in responsibilities. Each child can have tasks like setting the table or helping with cleaning. For example, Lynne Paul, working mother of three assigns her nine-year-old son Adam the task of making dinner one night a week. Adam must write out a menu, define what needs to be purchased on the Saturday prior to his night to cook dinner. She states that making dinner has boosted her son's self-confidence knowing that he contributed to helping the family achieve its goals.⁶ Finally, reward the family for a job well-done by having a celebratory family dinner or movie night each week.

Seek A Supportive Work Environment - Many companies care about helping parents with young children. A recent survey of federal employees found that satisfaction with work/family balance is a vital component of an employee's job satisfaction. The survey also found that the use of

policies such as on-site child care and flextime appear to help employees, particularly mothers, better face the dual demand of work and family life.⁷ Some progressive companies identified by *Working Mother Magazine* include:

- *Banc One* – Their family-friendly programs reduce absenteeism and turnover and increase employee retention. These programs provide a win-win situation for employees, the company and the customer. Banc One's program offers:
 - Flexible start and end times.
 - Telecommuting – Having time to do a few loads of laundry or start dinner while still working or talking on the phone may make the difference between a happy employee and one unable to feel good about either role.
 - Compression of working hours into fewer working days - For example, some employees work four ten-hour days instead of five eight-hour days.
 - Manageable hours – Employees are able to take a child to an appointment or to volunteer at the child's school during lunchtime.
 - Company Childcare Search Programs - the Company helps find providers near the employee's home. They also develop a list of questions for employees to ask potential child care providers.
- *Abbott Laboratories* - After taking an employee survey, Abbott Laboratories offers job sharing, flextime, and telecommuting.
 - These plans work for women who want some relief from the stresses of trying to do it all. Now instead of spending time on the weekends running errands and doing chores, job-sharing allows her to accomplish these on her day off so she can spend time during the weekends enjoying family and friends. Women who job-shared earned 60% of their former salaries, but benefits were retained and their working hours were reduced from 40 to 24. Management states that besides being happier, these employees were more productive. The mothers report that they are more relaxed and productive when they had more time at home.
- *Deloitte and Touche* – This large accounting firm located in Columbus, Ohio, was cited by *Working Mothers* for the past eight years for being one of the best companies for workingwomen because of their attitudes and initiatives when hiring and promoting women. Most women in the firm state that they could not be the mothers they wanted to be when working 60 hours a week. If it were not for the company embracing these programs, many say they would not be there. Some of the company's practices are:
 - Women are told that they still can advance or remain on the "partner track" even with a reduced workload.
 - Women have advanced time and time again even after their first child was born.
 - Since the firm has launched its new incentives for women, it has more than doubled its percentage of women partners and directors. The number of partners has gone up 30% in 2001 from 376 to 489.⁸

Get Organized - Establish a plan for making the transition to childcare as smooth as possible. Plan ahead, and then have a back-up plan. "It one of the most critical elements to success," states

a *Legal Assistants Today* article entitled, “Facing the Work Versus Family Dilemma.” Some helpful hints for planning include:

- Using a day planner.
- Keep a family calendar of events for all to see and discuss these items frequently during family times.
- Take advantage of lists in public places in your home such as a grocery list on your refrigerator for all to add necessary items.⁹

A critical part of organization is defining where and how to gain time. Look at your time as pieces of a pie. Each piece is an item that takes time out of your day, week or month. Determine which pieces are essential and identify the ones that can be eliminated in order to allow you to have more time for the most important demands. The following list includes suggestions for freeing up time:

- Use a housekeeping service
- Use a yard service
- Consider dry cleaning/laundry service
- Shop where grocery services are available (Pea Pod at Kroger)
- Assign family chores - Children can help with housekeeping responsibilities.
- Tie roles and tasks together. Try to combine phone calls with dishes laundry or ironing. Or get K-12 professional service commitments while volunteering at your child’s school.

Developing Healthy Personal Skills - Stress is going to be part of a workingwoman’s life. It generally is worst when a woman feels overwhelmed by doing so much but feels she is not good at any of them. *Page Wise*, a publication for women’s health, offers the following suggestions to manage stress:

- Seek and belong to a personal support group
- Learn to say “No”! /Clear your calendar.
- Make family time
- Allow yourself to make mistakes, learn from them and get over it!
- Take a break/indulge
 - Treat yourself
 - Manicure, pedicure or massage
 - Take a bath
 - Shop
 - Read a book
 - Take a long walk
- Get rid of Negative Forces of Energy that Drain
 - Stay positive
 - Be choosy about who you choose to spend leisure time with
 - Exercise/Diet¹⁰

Working mothers need to keep life in perspective by being realistic and honest with the family. Women should accept the choices they make and keep the major goals in mind.

Creating a system that works best for each of person will depend on individual career aspirations and goals, financial goals, childcare, family support systems, work environment and a women's personal attitude and commitment to achieve the goal of balancing work and family. It can be done, but these networks must be in place.

IV. Working Women/Mothers in the Fields of Science and Technology

According to *U.S. News & World Report*, Women now make up a strong 48% of college graduates who majored in science or engineering. Unfortunately, the percentage of women pursuing a doctoral degree is only 33%. Percentages are even lower in physical sciences, 23%, and in engineering, percentages drop to 12% as opposed to the 40% of women who earned M.D.'s last year.¹¹

Why are the numbers so low in the science and engineering fields in colleges and universities? The reason used to be sexual discrimination. However, now the reason seems to be slightly more complex. The *U.S. News & World Report* article states, "In the past, women were forced to adapt to a fundamentally flawed system".¹¹ Today, working environments need to adapt to support and sustain a changing workforce that includes women seeking to balance career and family.

Something is amiss when less than 10% of the faculty in the science and technology fields are women. If these trends continue, the hope of ever increasing the percentages of women in the field will die. Elaine Cooney and Barbara Christe in their paper, *Advice to "Professor Mom"*, give advice to women professors; "There is a critical link between female students pursuing degrees in the engineering disciplines and the presence of female faculty in their education. If female faculty are too stressed and struggle to balance family and career, their female students may lose motivation to continue in the field." They cite other barriers including the absence of both female and male mentors within the science and technology fields.

Cooney and Christe also offer a final reason that so few women are science and engineering professors. It is simply that it is difficult to achieve tenure.¹² A recent internal audit at the Massachusetts Institute of Technology and a study conducted by an economist at Penn State University concerning women and families in academia cited two reasons that women do not enter the engineering and science divisions. They believe that there is no easy balance between meeting the needs of a family and pursuing tenure, and the second is discrimination.¹²

First these women didn't think they could successfully combine career and family. Achieving a tenure position requires an inordinate amount of time from women whose biological clock may be ticking. If a woman's focus is divided between family and career at this critical time, colleagues may perceive that the woman is not serious about pursuing tenure. As a result, some women wait to start a family until after they achieve tenure and end up only having one child while others leave the profession or totally abandon their hopes of having a family.

Discrimination was also cited as a problem in terms of pay inequities and access to space, resources and "positions of power." This accusation was strongest from women who were

tenured and junior faculty members, and it plays a serious role in reducing the number of women in the profession.

V. Key Elements for Success

As mentioned above, there are many general steps women can take to help create a balance. However, there are two other criteria, specific to the untenured professor, that are necessary for success: personal affirmation for the untenured professor and modified university policies and procedures for both male and female faculty and graduate students.

Personal Affirmations - Women who want to achieve a balance between achieving tenure and nurturing a family need to be persistent, patient, firm, and have a supportive family environment. For example, being persistent may include asking about family leave and tenure extensions. If the responses are not positive, ask again, ask at another time, or ask someone else. Being patient involves understanding that it takes time to alter academic traditions. Learning about the protocols in an academic environment is necessary and may explain why it takes a long time to change policies. Being firm may involve defining limitations about what a working mother can and cannot do. State your limits and hold to them.

Modified University Programs – Corporations are making sweeping changes, but what can colleges do? Some plans made for academic moms include:

- Campus day care centers for faculty/staff children.
- Recommendations for child care in the immediate vicinity
- Compressed teaching schedule for a set number of days each week.
- Administrative and advising duties done from home using email.
- Allow sharing a teaching position for a set number of years
- Revise tenure standards to remove bias against working mothers.
- Allow a set number of quarters/semesters of leave for family agendas
- Provide distance-learning courses that can be managed from the home.
- Hire a liaison that will work with both university administrators and working mothers to develop reasonable alternatives for working faculty moms.

There are many top universities across the nation have lead the pack in regard to creating and modifying programs that help men and women faculty and graduate students find balance. Some examples include:

National Grants

- The Association for Women in Science in Washington, D.C., makes an annual grant available to a women graduate student who has taken off three or more years to raise a family.
- The National Institute of Health offers “re-entry grants” to men and women who have taken time off and are returning to labs later in their careers.
- The Alfred P. Sloan Foundation provides \$20,000 in matching grants to young faculty members who want to take family leave.¹⁰

It is important to mention that few women take advantage of these opportunities because the programs are not widely publicized and many women have the perception that they will be penalized if they use them.

University Programs

- Support Programs – women meet to discuss the ways in which the climate could be improved for female scientists.
- Changes in curriculum – Stanford University offers a four credit hour class entitled, “Women in Engineering: Perspectives.” The class was designed by female graduate students in the mechanical engineering department and introduces guest speakers to discuss issues such as integrating marriage and family with jobs and how to arrange time off.
- Female graduate students in the sciences mentor undergraduate students at The University of Southern California. The university also sponsors round table discussions on the issues faced by women in science.
- On-site daycare is offered to graduate students on some campuses.
- Other institutions are experimenting with part-time tenure track positions and job sharing (two people split a single tenure-track position).
- “Stop the Clock” – Male and female faculty can stop the tenure clock for up to a year to take time off or lighten their research and teaching load in order to attend to family matters.¹¹

VI. Conclusion

The reality of career building and child-rearing is that both occur in the same years. If universities want to increase the number of tenured women faculty, they must help these women, and encourage them to take advantage of programs that allow them to balance career and family. Although industry has offered alternate career options for working mothers, the academic world is still woefully behind, especially in science and technology areas. If our society wants to increase the percentage of women in the fields of science and technology, it must encourage the academic system to allow a wider latitude to accommodate women who have the knowledge and skills to teach the next generation, to research, and also to provide quality care for their children. Now more than ever, our nation's ability to compete in today's global markets depends strongly on our products and research. Increasing the number of women, including fulltime mothers, who enter and remain in these fields, will shape what our country will become in an ever-changing global economy.

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