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# Optimizing Maternal and Tenure Clocks: A Mathematical Proof

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## Synopsis

This essay shares my journey to solving the problem of timing, specifically as it applies to having a child on my journey towards a career as a mathematician in academia. I share some of the challenges I faced during pregnancy and the first few years of motherhood, which coincided with my first few years as an assistant professor of mathematics.

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**Keywords:** *mathematics, motherhood, academia*

Sitting in a room at Carnegie Mellon for an annual retreat discussing research on computation, technology, and math and science learning. I was one of the lucky few graduate candidates that were invited to attend this meeting of the minds. I felt out of place since I was not a computer engineer, but, as a female in mathematics, feeling out of place was my forte. I quickly made friends with a few new faculty members from institutions around the world, and by the end knew I belonged in this community.

On the last day of the meeting, the conference organizers held a panel for the graduate students and new faculty on what to expect of life in academia, presented by a variety of experts in the field. I remember noticing that there was only one woman up there in a sea of men. Again, sadly, this was not surprising. The first questions, directed at the male panelists, were to be expected; “How much should I publish in my first three years? What types of grants are available for my research?” Then it was the lone woman’s chance to take questions, and without skipping a beat a young female graduate student stood up and asked, “When is the perfect time to have kids?” I wondered, did none of the men have kids? Why was she the one asked?

As a novice mathematician, I quickly unpacked the question posed by this graduate student and began to solve it. It appeared to me that there were three major milestones on the journey toward a career in academia. I immediately proceeded by dividing the “perfect timing” problem into three cases: graduate school, new faculty, and tenured faculty.

**Case 1: Graduate School Baby.** Having a child while in graduate school could be ideal because your only focus is on earning your PhD. A major problem brought up in the panel was that you are not a contractual employee of the university, so health insurance and low funds would likely result in financial strain in new motherhood. Also, it was noted that you aren’t provided maternity leave, so you may have to unenroll and reapply to your program when ready to return. Also, upon completion of a Ph.D., women with children are 35% less likely to even enter a tenure-track position than males with children [2].

**Case 2: New Faculty Baby.** Waiting until your first few years of a tenure-track academic position could be ideal since you are in a contract with a university providing health benefits and a salary. Yet, one woman in the audience reminded us that with this financial stability came extra duties of teaching, research, and service all tightly aligned with the expectations for tenure promotion. Furthermore, women with children are 27% less likely to achieve tenure than their male counterparts [2].

**Case 3: Tenured Faculty Baby.** Waiting to have children until tenure promotion removes the concern of the tenure clock ticking, and although additional committee requirements and expectations will continue post-tenure, the panelists agreed that this was the best time to have a child.

*Therefore*, the perfect time for an academic to start a family is after tenure promotion, which occurs on average in the United States at 39 years old [1].

By this logic I did not get pregnant at the perfect time. I found out I was pregnant shortly after completing my doctoral qualifying exams with a due date in early August. At the time I was both teaching undergraduate pre-calculus and a graduate research assistant, as required for my funding, so an August due-date was less than ideal. As a mathematician faced with a problem, I looked at all the facts first:

1. I needed good health insurance,
2. I needed to be able to take time off in August to recover from childbirth and care for a newborn, and
3. I needed money to help with diapers and doctor's bills.

So I completed the next logical step and found a job that did not require a Ph.D., then began working full-time.

I defended my dissertation proposal, hiding my rapidly growing belly in a flowing blouse and then held a meeting with each member of my committee to reveal the news. The chair of my committee is senior faculty and does not have children. When I shared the news with her, she was concerned and pleaded with me to not drop out of the program. I later learned that her previous two female graduate students had children and never returned to complete their Ph.D. Another committee member, a successful academic mama, stressed, "You better write your dissertation before your pregnancy brain kicks in!" Some combination of hormones and stubbornness resulted in my doing just that. I wrote every morning before work and for an hour after work the entire duration of my pregnancy.

I was quickly on the job market with a newborn and supportive partner waiting at the hotel while I went on job interviews equipped with a briefcase and breast pump in my hand. Prior to entering my doctoral program, I was a high school math teacher. Coming from a career dominated by women, I did not find asking for time within my interview to pump as taboo. I quickly learned that this was not a normal request in the mathematics departments where I was interviewing. Since the interview schedules are dense with very little additional time, accommodations for my new mother needs were always rushed and rarely resulted in having time to pump.

At the end of my interview at my current institution, while listening to my dean tell me about his journey in academia I realized that I had leaked breast milk through my shirt and suit jacket. I was horrified as I smiled and nodded while he told me about his experiences in his first academic position. I must have hid the milk fiasco pretty well and had a glowing interview because I had an offer before I got home. During negotiations I was offered a year advance on my tenure clock, since I had completed a year as visiting faculty, but was advised by my chair "not to take this if I was planning on having more children." Do my male colleagues receive the same advice?

These first couple years as new faculty in a mathematics department have been great. The culture around family is definitely different than what I saw in high school. For example, I have never seen an email asking for class coverage due to a sick child or received an invitation for a baby shower for a new mom in the department. This has resulted in, outside of a few pictures in my office, keeping my career and family life separate. That being said, my being a mathematician and a mother are definitely not mutually exclusive. I have found that my expertise in problem solving would prepare me for the challenges faced in raising a child. When I first identify a problem (e.g. potty training), I research all the books, articles, blog postings, talk with other parents and devise a plan. Similar to solving math problems, your initial plan is rarely going to get you to the answer. Your first ten revisions of your plan may not result in a solution, but with each iteration you will move closer to a solution. Either that, or my daughter will be in diapers until college.

I took the advance on my tenure clock and while putting together my 3rd year review this fall I found that I have been quite productive in my first few years in academia while also being a successful mother. While being productive toward tenure, turns out I am also still reproductive and am expecting my second child in June 2018! So far this pregnancy as new faculty has come with its own set of challenges. Between teaching four classes this fall, writing two grants, and chasing around a three year old, I have been sneaking to OBGYN appointments, dealing with morning sickness and a level of exhaustion that according to the books cited should be better by now. In preparation for sharing the news with my department, I asked a friend and new mother in the sociology department how her chair reacted to the news of her pregnancy, and she simply said “Well, she brought me a diaper cake to my baby shower!” Although there were no diaper cakes from my chair, he did congratulate me, and then we discussed the logistics of what this meant for my fall 2018 semester. Yes, another child may impede my path toward tenure, but it also may not and I am up to the challenge.

Now I am here to answer the question posed at that conference many years ago, “When is the perfect time to have a child on your journey to career mathematician?” The perfect time to have a child is when you decide you want to have a baby. Yes there were challenges, but who better to face those challenges than a mathematician?

## References

- [1] European University Institute (EUI). *USA: Academic Career Structure*. <https://www.eui.eu> (accessed April 20, 2018)
- [2] Goulden, M., Mason, M.A., & Frasc, K. (2011). Keeping Women in the Science Pipeline. *The Annals of the American Academy of Political and Social Science*, 638(1), 141-162. <https://doi.org/10.1177/002716211416925>