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## **Academic Motherhood in Mathematics Teacher Education during COVID-19: Breaking the Silence and Shifting the Discourse**

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# **Academic Motherhood in Mathematics Teacher Education during COVID-19: Breaking the Silence and Shifting the Discourse**

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## **Abstract**

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Despite decades of social change and institutional reform, the academic gender gap continues to exist in many countries around the world and disproportionately affects women with children. Early indicators suggest that COVID-19 will widen this gap and exacerbate issues academic mothers face. In this essay we seek to raise awareness to the challenges and tensions academic mothers in mathematics education face both outside of and during a pandemic. We use existing literature on academic motherhood to make sense of our lived experiences, working to reframe pieces that are so often viewed as deficits to assets for our work in mathematics education. We hope that this will bring visibility to the invisible ways our identities as mothers inform our work as mathematics teacher educators and researchers. We conclude this essay with a call for the university-based mathematics education community to break the silence around the inequities associated with academic motherhood in our field and to shift the discourse from deficits of academic mothers to asset orientated views.

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**Keywords:** mathematics teacher education, academic motherhood



# **La Maternidad Académica en la Formación de Profesores de Matemáticas durante COVID-19: Romper el Silencio y Cambiar el Discurso**

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## **Resumen**

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A pesar de decenios de cambios sociales y reformas institucionales, la brecha de género en el ámbito académico sigue existiendo en muchos países del mundo y afecta de manera desproporcionada a las mujeres con hijos. Los primeros indicadores sugieren que COVID-19 ampliará esta brecha y exacerbará los problemas que enfrentan las madres académicas. Utilizamos la literatura existente sobre la maternidad académica para dar sentido a nuestras experiencias vividas, trabajando para reenmarcar piezas que tan a menudo se ven como déficits a activos para nuestro trabajo en la educación matemática. Esperamos que esto traiga visibilidad a las formas invisibles en que nuestras identidades como madres informan nuestro trabajo como educadores de profesores de matemáticas e investigadores. Concluimos este ensayo con un llamamiento a la comunidad universitaria de educación matemática para que rompa el silencio en torno a las desigualdades asociadas a la maternidad académica en nuestro campo y cambie el discurso de los déficits de las madres académicas a puntos de vista orientados a los activos.

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**Palabras clave:** formación del profesorado, maternidad académica

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**D**espite decades of social change and institutional reform, the academic gender gap continues to exist in many countries around the world (e.g. [Huang et al., 2020](#); [Seierstad & Healy, 2012](#); [Thun, 2020](#)). This gap disproportionately affects women with children, namely academic mothers, especially those who had children early in their careers as it can result in delays in research and publications, along with consequences for tenure and promotion (e.g. [Antecol et al., 2018](#); [Bartel et al., 2018](#); [Mason et. al., 2013](#)). Given the challenges and inequities academic mothers have historically faced, and continue to face in their career advancement compared to their childless peers and male counterparts, it is disheartening that these issues are still not openly discussed and that they continue to pose an important equity issue in our field. Early indicators suggest that COVID-19 will exacerbate these issues as journal submissions have either remained the same with an increase in male submissions, or shown a decrease in female submissions ([Flaherty, 2020](#); [Murdie, 2020](#)). This is also evident in anecdotal reports from our colleagues, and our own experiences as academic mothers of young children during this pandemic. As the inequities became exacerbated during the pandemic we felt compelled to explore the literature surrounding academic motherhood, as this was something not explicitly discussed in our graduate studies or early career.

As we read, we discovered that many of the tensions written about resonated with our current situations. We also noted that overall the discourse seemed to focus on the deficits, where we were also encountering moments that we viewed as assets to our work as mathematics teacher educators from our roles as mothers. In this essay we seek to raise awareness to the challenges and tensions academic mothers face both outside of and during a pandemic. We hope that this will bring visibility to the invisible ways our identities as mothers inform our work in academic settings. This centers our role as mothers in academia as more asset based and shifts the narratives about academic motherhood while bringing it to the mathematics education space. We begin with an overview on our respective contexts including our roles as mothers and where we are in our academic trajectory. From here, we use existing literature on academic motherhood to make sense of our lived experiences, working to reframe pieces that are so often viewed as deficits to assets for our work in mathematics teacher education. We recognize this article may read as

gender binary. This, however, is not a reflection of our orientations and how we view academic parents, nor is it our intent to dismiss non-binary academic parents' experiences. The literature base on gender and parenting in academia is, for the most part, gender binary as it highlights disparities between female and male faculty. Both of us identify as women and academic mothers, and therefore, use themes in the literature to help make sense of our lived experiences. We acknowledge our privilege in our binary gender identities as we can 'see' ourselves in the literature. We also acknowledge the luxury that the academic profession affords us in demanding that our multiple roles are recognized in our professions in the first place.

We draw from relevant literature published in peer reviewed journals and books over the past 20 years as well as recent publications in response to the pandemic. We have organized this piece into sections based on both our findings from the literature as well as our own experiences as academic mothers during the ongoing pandemic. We conclude with a call for the university-based mathematics education community to break the silence around the inequities associated with academic motherhood in our field and to shift the discourse from deficits of academic mothers to asset orientated views.

### **Our Contexts**

Eugenia is a mid-career tenured professor in mathematics education. She identifies as a white woman and she is in a heterosexual marriage with two children. When she was interviewing for tenure-track positions as a doctoral candidate, she was purposefully seeking employment at an institution with a parental leave policy (one semester leave with full pay). Such parental leave policy was not, at the time, commonplace in research intensive universities in the United States. During her tenure earning years she had two children, now ages 7 and 9. Despite help from her mother and mother-in-law, who both took turns leaving their home countries and staying with Eugenia and her family for long periods of time while her children were babies, taking two semesters of parental leave, one for each child, and stopping her tenure-clock twice, she found the tenure process to be exhausting. Like many academic women she had taken on extremely heavy teaching and service loads. Like many tenure-earning academic

mothers in research intensive universities, she had to become a ‘superwoman’ to make it through tenure.

Jenn is an early career faculty in her second year of a tenure track position. She also identifies as a white woman and is in a heterosexual marriage with two children. The eldest, an 8-year-old, was born two months before Jenn officially started her doctoral program (she was granted a deferred start because of her pregnancy). Much of that first semester she spent navigating being a first-time mom, new doctoral student and in a new job as a liaison for the school district and local university. Her second, a 3-year-old, was born two weeks after she finished collecting data for her dissertation, with Jenn returning to the university to teach her assigned class less than a week after giving birth. Having two young children played a pivotal role in her decision of where to apply for tenure track positions, as well as what job to take. She wanted to have the space and flexibility to engage in both the role of mother and academic.

### **Issues for Academic Mothers (and not Fathers/Parents)**

Despite decades of social change and institutional reform, the ‘academic gender gap’, (i.e. male/female differences among faculty, including variations in job security, working hours, rank, salary, job satisfaction, collegial networks and retirement age) persists and disproportionately affects academic mothers, whose careers tend to lag behind those of childfree women and fathers, thus suffering a ‘motherhood penalty’ (Baker 2010; Budig & England, 2001; Portanti & Whitworth, 2009). Even in Scandinavian countries that are some of the most gender-equitable in the world, female academic report “little sex equality in their universities.” (Seierstad & Healy, 2012; p. 306) “despite ‘women-friendly’ policies, the socioeconomic and familial context surrounding women’s reproductive capacity continues to form the basis of the discrimination” (p. 307). A disproportionate percentage of tenured and senior academic women are single, divorced, and childless, suggesting that integrating work and family remains problematic for women (Baker, 2012). Female doctoral students describe an academic culture of high expectations, in which mothers could be successful if they maintained a silence about their identity as a mother and ensured that their family life did not negatively impact their work

productivity (Mirick & Wladkowski, 2018), the latter being something both of us have felt pressured to do, even within Colleges of Education where faculty may have engaged in expansive work with children and families. Within these spaces, we have overheard mothers being reprimanded for not “keeping up” due to childcare responsibilities, while fathers are applauded for attending to childcare responsibilities and are labeled as “such a good dad!” We have even witnessed academic mothers being told they are “a disgrace to women” for being unable to focus on research because of having to look after their ill child, and being labeled as “unprofessional” for asking to leave a meeting in order to pump breastmilk or feed their newborn baby. We have also witnessed academic mothers being praised for not choosing to pursue a doctoral degree until after their children were all grown up because “this is the way to do it, as children need their mothers when they are young.” Statements like these reflect the historical bias against motherhood in academia, including in Colleges of Education, which has remained present despite more visibility of female faculty mothers and has promoted this culture of silence around issues of academic motherhood (Pasque, 2015).

According to Mirick and Wladkowski (2018), the majority of doctoral students spoke of wanting to find a position in a family-friendly organization where family was valued and work life balance was possible. Similarly, Jenn, who had both her children during her doctoral studies, decided to take on a position at a less-research intensive institution than the one in which she earned her doctoral degree in order to relieve herself from a culture of publish or perish and attempt to carve out more time for life as a mother. Eugenia looked for a position that offered a parental leave policy anticipating that this would provide her with adequate support needed to be successful in balancing motherhood and a career at a research-intensive university. Danell and Hjerm (2013) suggest that women are significantly less likely than men to become professors, and Martinez et al. (2007) found that in some cases family considerations are viewed as a deterrent to research careers. Sallee et al. (2016) noted that even in academic environments, gender socializations were upheld for families. Drago and Colbeck (2003) found that faculty mothers are more likely to work part-time and have lower rates of tenure than women with no children and their male counterparts. More women than men are primary caregivers of young children and researchers conclude that ‘babies matter’ to academic

women's promotion (Grummell et al., 2009). Living with young children is associated with employment and earnings advantages for men but disadvantages for women (Correll et al., 2007) and mothers are less likely than fathers or childless women to reach the senior ranks of academia (Probert, 2005; Monroe et al., 2008). Oftentimes, research productivity will increase for women once their children are enrolled in elementary school settings (Hunter & Leahey, 2010), but this is not certain and for many women occurs post tenure.

Those who become mothers early in their academic career are less likely to be tenured than those without children (Mason et al., 2006) even with the implementation of parental-leave and tenure clock stopping (Antecol et al., 2018; Bartel, et al., 2018; Stearns, 2015). We have overheard faculty, including academic mothers, describe having a second child during tenure earning years as “tenure suicide.” Right before Eugenia took her first parental leave she was told by other faculty that this would be a great opportunity for her to “get some writing done” as if a parental leave were equivalent to a sabbatical leave. We have also heard of numerous anecdotes of tenure and promotion committee members judging the research productivity of women who stopped their tenure clock more harshly, as if it is expected that the extended time to tenure should yield additional publications. This is amplified by some academic fathers’ misuse of parental leave to work on their research (e.g. Rhoads & Rhoads, 2012). It is no wonder that many women feel that they must make a choice between having children and earning tenure (Snow, 2017; Stockdell-Giesler & Ingalls, 2007), other women feel pressure to continue producing research while on parental leave (Lundquist, Misra, & O’Meara, 2012), and that some women opt out of entitled parental leave or tenure clock stopping due to fear of bias and/or retribution (Ward & Wolf-Wendel, 2012). Ward and Wolf-Wendel have argued that parental-leave and clock-stopping policies treat the symptoms and not the problem, while Antecol and colleagues found that gender-neutral tenure clock stopping policies result in cumulative disadvantages for women’s careers. Further, on average, women faculty perform significantly more service than their male counterparts, across the board (Guarino & Borden, 2017). Many women who are successful in combining full-time academic work with motherhood continue to face tremendous challenges in terms of working hours, stress levels, and work/family conflict, and may risk long-term physical and



mental health issues in the process (Ollianen, 2019). This leaves many academic mothers at research intensive universities, like Eugenia, physically, mentally, and emotionally exhausted by the time they make tenure.

Further, men tend to marry ‘down’ in terms of age, educational attainment and occupational status (Baker, 2010). Academics also follow this pattern. For example, Mason et. al (2006) found that married male doctoral students in the US were more likely than females to have younger partners with part-time, temporary or no paid jobs. Marriage to a ‘junior partner’ enables men’s careers to gain priority in the household (Bracken et al., 2006). Male faculty are four times more likely to have a stay-at-home partner than female faculty (20 percent vs. 5 percent), and female faculty with children spend considerably more time engaging in caregiving activities compared to their male counterparts (Shurchkov, 2020) trying to balance the image of being a good professor and good mother. This attention to the navigation of both roles has shown to result in internalized guilt for women (Salle et al., 2016), whereas the same type of guilt for men does not occur from attempting to integrate work and family. Women tend to accept more responsibility than men for housework even when they work full-time (Craig, 2006; Lindsay, 2008), which also pertains to academics (O’Laughlin & Bischoff, 2005). This may be that women perceive housework as an element of family strain, which affects women more than men (Elliott, 2008). Educated men perform more household work than other men (Craig, 2006) but male academics still report less involvement than female academics (Mason et al., 2006). Women who become mothers typically work harder than men to create work/life balance but they also accept more responsibility for household work, including allocating, doing and supervising it (Baker, 2012). In addition to doing most of the physical housework and childcare, mothers also are the ones who most often manage, plan, anticipate, and organize both routine and unexpected household tasks and family events, as well as support the daily well-being of family members (Ahn et al., 2017). This work is known as ‘invisible household labor’, reflects the mental and emotional labor inherent to being the primary manager of a household that often precedes the routine, physical work of maintaining the household (Offer 2014), and research suggests that it takes a great toll on mothers’ well-being (Cicciola & Luthar, 2019). Similarly, female university faculty, including those who are

mothers, tend to take on a larger load in teaching and service compared to their male counterparts (Guarino & Borden, 2017) and this ends up being another type of ‘invisible work’ that is not recognized in many institutions. During tenure-earning years, when academic mothers, like Eugenia, may find it impossible to negotiate a more equitable balance between research allocation on one hand and teaching and service allocation on the other, this additional load not only leaves them working longer hours but may also be detrimental to their academic advancement, especially if their position is research intensive.

### **Academic Motherhood and the COVID-19 Pandemic**

As we live through a global pandemic during which inequities across the board are exasperated (and some for the first time become visible to many), it becomes even more pressing to break the culture of silence that exists around issues of academic motherhood in our field. Early indicators suggest that academic mothers risk suffering yet another ‘motherhood penalty’ (Baker 2010, 2012; Budig & England, 2001; Portanti & Whitworth, 2009) amidst the COVID-19 pandemic, that may result in careers of mothers lagging behind those of childfree women and fathers (Minello, 2020; Saniskuaski, 2020). For many researchers, the new reality of remote working means more time for research. In contrast, parents of young children are facing uniquely challenging responsibilities. Schools and summer camp programs are virtual or remain open but no longer viewed as viable options due to health concerns. Although academic fathers are not immune to the impacts of confinement, it is traditionally women who carry the heaviest load (Machado, et. al, 2019; Mason et al., 2013). Based on our own experiences and anecdotal reports from our colleagues, it became clear to us that the ‘invisible household labor’ academic mothers with young children engage in, multiplied overnight, was here to stay, and its magnitude remained invisible to many colleagues who bragged about how (research) productive they were during this time, or those who sympathized, but could not empathize with our context.

Instead of pushing forth their research agendas and writing papers, academic mothers are more likely to devote time to homeschooling and tending to children and doing household chores (Minello, 2020). We both

experienced these issues as our children shifted to an online learning format and in our roles as educators, we were seen as the more qualified parent to take on the role of “teacher” at home (even requested to do so by our children). As school closures/online learning continued for the remainder of the 2019-2020 school year, like their academic mother peers, in addition to the household responsibilities we would normally have - referred to in the literature as ‘the second shift’ (Goode, 2000; Hochschild & Machung, 2012; Ward & Wolf-Wendel, 2004) - we spent a significant amount of time supporting our children’s learning (both online and through play based experiences) from home and parenting during a crisis, while we also converted and taught our courses online, supervised dissertations, attended numerous meetings, coordinated programs, etc.

At the same time, we observed our childless peers, some academic mothers with older offspring, and most of our male colleagues have an unprecedented amount of time in their disposal to promote their research agendas. With the pandemic projected to extend through the Summer and well into the 2020-2021 school year, we were looking into the high possibility of our (and our colleagues’) current situation extending for at least several more months. Prior to the pandemic we perceived an uphill climb to be successful in our roles, and when the pandemic hit, we felt as if we fell into an abyss. For those who have not yet leaked from the pipeline (Huang, et. al., 2020) and are struggling to keep their careers on track, these months of heavier duties are expected to increase the distance between them and their male and childless peers (Saniskuaski, 2020). Six weeks into widespread self-quarantine, editors of academic journals noticed women submitting fewer papers (Kitchener, 2020). In fact, journal article submission data reveal a large decrease in productivity of female academics in the months since the beginning of lockdowns and stay at home orders (over 20 percent decline in April 2020 relative to the mean), while men are submitting more papers and projects than women over the same timeframe (Shurchkov, 2020). Shurchkov posited that the decrease in productivity of female academics was primarily due to a decrease in productivity of female academics *with* children. Langin (2021) found that in the months after the pandemic started, both the increase in the amount of time spent on childcare and housework and the decrease in the amount of time spent on research and other job tasks were greater for academic mothers compared to academic fathers. As we were both working with several other academic

mothers on research projects, many of these needed to be put on pause due to the pandemic and shifts in childcare and/ or work times. As states began closing, the slowing of projects seemed to snowball until they were either more drawn out or on pause until life settled. At times, those that were not slowing down caused anxiety and stress as we tried to present the image of “superwomen”. Late night work sessions became the norm to keep with any sort of research productivity, which left us even more exhausted and unable to think clearly about our day to day tasks, let alone engage in deep meaningful research. Stress, anxiety and guilt from the pressure coming at us from multiple angles left us uneasy and restless. Falling asleep at night became difficult as lists of things to do for home and work raced through our heads. By the time we felt some relief, we were exhausted, both mentally and physically.

While the mental and emotional load that comes with the invisible household labor, including the invisible work of parenting, has exponentially grown for mothers during the pandemic, so has the emotional stress and strain, especially for academic mothers who are: single parents, have children with exceptionalities, who are members of communities disproportionately affected by the coronavirus pandemic (such as Black, Latina, and Native American women in the US), who themselves or members of their household are at increased risk for serious illness from COVID-19, who have disabilities (including invisible disabilities) or live with family members with disabilities, or who themselves and/or their spouses are deemed an essential workers during the pandemic. Eugenia’s spouse is a first responder and therefore at increased risk of contracting the coronavirus. Eugenia has an autoimmune disease (type 1- Diabetes) which may put her at increased risk for severe illness from COVID-19, as well as a behavioral disorder that is tough to manage under periods of high stress. Coping with and managing the stress she and her family deal with as a result of this adds another layer to the ‘invisible work’ she had to do as a result of the pandemic.

Many academic institutions are now offering leave options for looking after children during school closures. (e.g. the Families First Coronavirus Response Act funded by the U.S. Department of labor). However, even though these options were available as of April 1, 2020, faculty at Eugenia’s institution did not become aware of them until the Summer, after schools had been closed for ten weeks already and the school year had

ended. Despite recommendations from medical experts for school closures due to substantial community spread, the school district Eugenia's children attend was pressured to reopen at full capacity through the 2020-2021 school year in order to receive desperately needed. Parents are given a choice of whether they would like to send their children to school or keeping them home and attend school virtually. Like many working parents, Eugenia faced the dilemma of whether to send her children to school knowing the risks associated with doing so or keeping them home to attend school virtually but without being entitled to take a leave since schools are not closed. Further, just as parental leave may be viewed as similar to a "sabbatical" leave, expecting faculty to focus on research (Lundquist, Misra, J., & O'Meara, 2012), we fear the same may be true with this novel type of leave, should schools close again. We witnessed many academic mothers purposefully not taking advantage of this leave. This is an example of what Ward & Wolf-Wendell (2012) call *bias avoidance*, a strategy many academic mothers use due to fear of bias and/or retribution.

Many academic institutions are also currently offering widespread tenure clock extensions due to COVID-19 available to both male and female faculty regardless of their circumstances, which based on preliminary data on the effects of COVID-19 on gender gaps in academia, may exacerbate gender inequality (Shurchkov, 2020). We know from recent research that similarly broad parental leave policies can lead to unintended consequences, including an increase in the academic gender gap (Antecol et al., 2018; Bartel et al., 2018). Therefore, even though the widespread implementation of optional tenure clock stops for pre-tenured faculty may be a positive development, it will have negative longer-term consequences, such as lower salaries for those who choose to take these accommodations (500 Women Scientists, 2020). As a current untenured faculty member, Jenn felt increased pressure to advocate for her needs surrounding the tenure and promotion process. As discussion of tenure clock extension surfaced at her institution, she began to pause and feel a bit antsy about the implications for the pandemic on her movement towards tenure and promotion. These two pieces represented stability for her and her family. Her family had built a home here. She certainly did not want to uproot her two young children to move again, having already decided that if tenure did not happen she would remain in the area and teach if tenure was not

achieved. If she took the extension, this meant another year of waiting. It meant that she may not be able to go up early, which was an option she had considered. It meant waiting for a raise, which would help support her family. Where was the space to highlight all the things she was doing during this time as a mother and mathematics educator? How would she communicate this during her mid tenure narrative, and later, tenure narrative? How could she have some sense of confidence the committee would care, or at least see the ways in which these pieces contributed to her teaching of mathematics methods courses and research around early childhood mathematics.

### **Assets of Academic Mothers in Mathematics Teacher Education**

In reviewing literature on academic motherhood, it became apparent that the majority of academic work was heavily skewed towards reporting the stresses and strains of combining academia with motherhood. Although well needed, and understandable, this focus may have led to the perpetuation of negative views on academic mothers and what they are capable of achieving, to the use of deficit language, such as naming academic motherhood a ‘academic-motherhood handicap’ (Kittelstrom, 2010), and views of motherhood as an obstacle or a problem to be dealt with in order for academic women to succeed (Acker & Dillabough, 2007). Researchers have argued that by including positive and balanced stories to the broader discourse, a more representative picture of motherhood in universities can be revealed, and with it, a greater understanding of the challenges, hardships, and positive aspects that come with it (Dickson, 2018; Jakubiek, 2015; Ward & Wolf-Wendell, 2012). Dickson, for example, highlighted the level of preparation and organization involved in mothering is a skill which transfers helpfully to the academic domains and leads to the development of better time management, organization and efficiency; increased compassion and empathy towards students and other colleagues; first-hand knowledge on the latest in education, education reform, child development, and cognitive development, resulting in a better rounded academic. Moreover, the role of mother, positions academics to have perspectives allowing them to interrogate inequities within schooling and educational systems (Lapayese, 2012). These skills, often seen as

invisible work within the workplace, were evident as we both moved our respective classes to an online format, but remained mindful of the needs of our students during this time. Our experiences as mothers had prepared us to consider the needs of students that might be caring for others in their home, navigating household and academic tasks, having limited time to themselves, and a need for flexible due dates and meeting times.

The mathematics community recently made a shift into talking about the experiences of academic mothers in the *Journal of Humanistic Mathematics*' July 2018 *Special Issue on Mathematics and Motherhood*, where, for the first time we saw academic mothers authors making direct links between their experiences as mothers and their scholarship. For example, Simic-Muller (2018) describes how she leverages her positioning as a caregiver in her roles as a mathematician, teacher, and mother to promote social justice, while Kolba (2018) describes how her experience with her twin pregnancy motivated her to conduct research on poly-ovulation frequencies. Given the context of mathematics teacher education having strong connections to children and schools, unearthing ways in which parenting, educating, and doing mathematics with our own children informs our work as mathematics educators is essential in shifting the discourse around academic motherhood in our field to one that recognizes motherhood as an asset, rather than a deficit. Academic mothers whose field of expertise lies in mathematics education and who have been working closely with their school-aged children during the pandemic are likely gaining unique insights into mathematics education and mathematics teacher education during this time of crisis. Through parenting, educating, and doing mathematics with their children, academic mothers in mathematics education are both leveraging and further developing their funds of knowledge for mathematics education and scholarship. These funds of knowledge, if disseminated, could potentially make unique contributions to mathematics learning, teaching, teacher education and scholarship. However, it is academic mothers who during this crisis are stretched too thin and therefore less likely to disseminate these insights to the broader mathematics education community. Therefore, we worry these unique insights that may contribute to reimagining forms of equitable mathematics education during these times may remain invisible, just like much of the 'invisible work' academic mothers do at home and in their profession. Below, we elaborate on some of the ways in which we view our

roles as mothers as assets to our engagement in further teaching and research as mathematics teacher educators.

As Eugenia worked closely with her children to support their online schooling, she realized that she was learning a lot from this process and reflected on how it was informing her work as a mathematics teacher educator. She realized that our programs do not prepare teachers to teach mathematics virtually nor to address equity issues when teaching mathematics online. What does it mean to teach mathematics for equity and social justice *online*? How do we prepare mathematics teachers to teach mathematics for equity and social justice *online*? As a means to help her children make sense of the pandemic (also take appropriate action and to work through some of the concerns they were having knowing that their mother is high risk), Eugenia co-developed social justice math projects with her children. She was able to use these projects as examples for how young children can engage in such projects to prompt her students (middle school mathematics pre-service teachers) to think of ways that middle schoolers could work on similar type projects. Because Eugenia has an underlying health condition and this pandemic has been particularly stressful because of this, working with her kids on social justice math projects to better understand the pandemic felt therapeutic both to her and her children. This experience solidified her thinking relevant to teaching mathematics for social justice as a way to help individuals (teachers and students) work through crises. However, this also solidified her realization that in the social justice math literature there's minimal consideration about how to teach those students who are very vulnerable and we have endured trauma, due to the circumstances that a social justice project would be exploring. Could doing so have an adverse effect? In other words, this can be therapeutic but it can also be damaging. These are only few examples of how just within a few weeks much of the 'invisible work' Eugenia was engaged in provided her with unique insights that informed her work as a mathematics teacher educator and scholar. Will these types of insights lead to top tier journal publications required to be promoted to full professorship at her institution? Probably not. At least not in the near future. However, these types of experiences continue to shape her as a mathematics teacher educator and continue to inform her in ways that would probably not be possible if she were not an academic mother with young children during this pandemic.



As Jenn’s eldest daughter worked through her 3<sup>rd</sup> grade digital learning, she often would wait to complete her assignments, noting that she wanted “mommy to help since she is a teacher”. This was especially evident when it came to work around mathematics. Her daughter was frequently assigned mathematics through iReady, a digital mathematics program, which was supposed to assign lessons based on her diagnostic data from earlier assessments. This proved to be the most time-consuming piece as she tried to attend to the learning needs of her child. The program continuously gave lessons that were well beyond the grade level of her daughter, often time working on content that was two or more standards beyond her daughter’s grade. Her daughter, not having explicit prior experience with the content at school did not have sufficient conceptual understanding of the concepts being introduced. Because of this, she spent time working to design learning opportunities for her child that more accurately reflected the grade level she was working in, focused on project-based learning opportunities, and addressed social justice issues with mathematics such as food insecurity and access to medical care. With her youngest, Jenn spent time thinking about the ways in which she might ask questions and work towards building mathematical understanding during the play-based experiences she negotiated with her daughter on. This included finding times to cook and bake together, doing puzzles, finding and counting collections from daily walks and visits to the playground, and measuring various items around the house to help conceptualize how long 6 feet is.

### **Our Call to Action**

When the pandemic hit we immediately became discouraged at how we might find time or energy to engage in research while being academic mothers of young children during this time of crisis. As time evolved, we felt compelled to write this piece, both as a means of making sense of our experiences, and as a way to bring to light the assets we believe being mothers affords us as mathematics teacher educators. We found ourselves becoming so passionate with the topic that reading and writing no longer felt like work. It became intertwined in our own development as academic

mothers, moving us to write this piece as a call to action as we advocate for continued attention to this subject. We decided that if we were going to lose sleep over something, it would be on finding ways to make these issues visible in our field. The pandemic has opened our eyes to so many things surrounding academic motherhood that this paper has provided us solace. We wrote this piece operating under limited capacity, but writing served to be therapeutic in many ways, as we felt as if we were not alone in this space, but rather surrounded by a community who has paved the way for us to have these conversations and raise awareness to the issues we are still currently facing as mothers in academia. The narrative around academic motherhood needs to shift to become commonplace as we noticed that although some academic mothers spoke up about the predicament they are in, most remained silent - at least in the public sphere. We could not stop thinking about how problematic this silence is and became disheartened that issues that academic mothers face are still not openly discussed and continue to pose an important equity issue in our field.

We recognize that many of the issues we have presented are not specific to academic mothers in mathematics education and are shared by academic mothers in a variety of fields. Given the role of academic mothers to have perspectives that allows them to interrogate inequities within schooling and educational systems (Lapayese, 2012), coupled with mathematics education having strong connections to children and schools and expertise in teaching and learning K-12 mathematics, unearthing the affordances academic mothers in mathematics education gain through parenting, educating, and doing mathematics with their children, is essential in shifting the discourse around academic motherhood in our field to one that recognizes motherhood as an asset, rather than a deficit. In working closely with their school-aged children during the pandemic, academic mothers in mathematics education in particular, like us, are gaining unique insights into mathematics teaching and learning and reimagining educational opportunities during this time of crisis. As echoed by some of our academic mother colleagues, our own experiences found us faced with mathematics practices we knew to not be beneficial for teaching and learning in mathematics and we needed re-design learning experiences for our children. This positioned us to become immersed in the teaching and learning of mathematics and draw expertise from mathematics education in novel ways. However, it is these academic mothers who, although pressured to

make tenure or seek promotion, are less likely to find the time and energy to disseminate these insights to the broader mathematics education community. Academic mothers in mathematics education may not even consider these insights worthy of dissemination since doing mathematics with our children, and learning from this activity, is not typically considered publishable work. We worry these unique insights that may contribute to reimagining forms of equitable mathematics education will remain invisible, just like much of the 'invisible work' (Ahn et al., 2017) academic mothers do at home (Offer 2014) and in their profession (Guarino & Borden, 2017). This important knowledge may be set aside until later dates and potentially lost. The potential loss of this knowledge relative to mathematics education is critical given the essential role of mathematics and quantitative reasoning in the 21st century and its' gatekeeping impacts (e.g. Douglas & Attewell, 2017; Martin et. al., 2010), and predictions of the widening of the mathematics achievement gap between students from different racial and socio-economic groups (e.g. Goldstein, 2020; Strauss, 2020).

Finally, although some of the issues we note are specific to the US context (e.g. the tenure process, stopping the tenure clock), most of the issues we have shared here apply to academic mothers in mathematics education around the world. We were astonished that we had not been aware of research literature on academic motherhood until now as it echoed much of our own experiences. We further reflected on the fact that most transparent conversations we have had around these issues have been with other academic mothers and not the broader community. The role of being an academic mother has both personal and political consequences. With this piece, we aimed to further raise awareness regarding these personal and professional consequences while moving towards increased naming and acceptance of the professional contributions surrounding academic motherhood in mathematics education. In doing so, we hope to shift to a recognition of the assets that university-based mathematics teacher educators mothers bring with them to their teaching practice, research scholarship, and service commitments.

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