

## How motherhood enhances and strains doctoral research/ers

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## **How motherhood enhances and strains doctoral research/ers**

*Motherhood is often positioned as incompatible with further education, and various cohort studies have revealed the many ways in which mothers are discouraged from and disadvantaged in higher education. Guided by role theory, we investigated the experiences of more than 1300 'PhD mums' from across the world as they simultaneously navigate the roles of doctoral researcher and mother (or mother-like role). Using a mixed-methods survey design, qualitative and quantitative results were analysed to reveal the contradictions and complexities of the PhD mum experience, with motherhood both straining and enhancing the doctoral journey. Motherhood may place considerable strains on doctoral researchers, including on their ability to conduct and write-up their research. These strains are exacerbated by inequitable and gendered role expectations, finite resources, and limited support, often at the expense of doctoral researchers' physical and mental well-being. However, it is not all negative, and PhD mums can bring a range of skills and attributes that are valuable to individual doctoral studies as well as doctoral programs and institutions more broadly. The benefits also extend to the PhD mums themselves, their families, and their communities. This paper challenges unfounded assumptions about the commitment and ability of mothers to succeed in doctoral education, but also raises serious concerns about the role of institutions in perpetuating social inequalities while espousing commitment to diversity, equity, access, and inclusion.*

Keywords: Doctoral education, motherhood, PhD mum, role strain, role enhancement

### **Introduction**

PhD mums, individuals who are engaged in doctoral education and at the same time have responsibility for the care of children in a mother or mother-like role, encompass "dual lives" (Brown & Watson, 2010, p. 402) that they attempt to "balance" (Tiu Wu, 2013, p. 1),

“juggle” (Schwab, 2020, p. 7), “weave” (Schriever, 2021, p. 1962), “manage” (Alhajjaj, 2016, p. 1), “negotiate”, and “integrate” (Rockinson-Szapkiw & Watson, 2017, p. 112). Common challenges revolve around the demanding and often competing expectations of what it means to be a ‘good’ mother, and what it means to be a ‘good’ researcher, expectations that may come from the self, the institution, and society (Trepal et al., 2014). PhD mums may have a desire “to be both” (Abetz, 2019, p. 70), but find that they are “stretched thin” (Yalango, 2019, p. 171), and as a result they may (be forced to) make various sacrifices, including to their own health (Broghammer, 2016). The experience of being a PhD mum may be felt differently for different cohorts, such as part-time (Cronshaw, 2017) and international students (Fridani et al., 2020). In the United States, a number of studies centre the experiences of Black mothers who face additional challenges (e.g. Patterson-Stephens et al., 2017; Rogers et al., 2019; Tucker, 2016), “as they are not only fusing families and careers with doctoral work but also with their racial and maternal identities” (Appling et al., 2018, p. 60).

While some higher education institutions (HEIs) and nations have made explicit an agenda of inclusion and support of parents, women, and/or mothers in academia, the reality is that the playing field is far from level. To provide a truly supportive and inclusive academic environment for PhD mums, there must be systems in place that are responsive to the realities of their shared but diverse experiences. This begins with an understanding of what those experiences are, and how they impact on the doctoral research journey. In this study, we add to the existing knowledge body, which largely consists of small-scale and localized qualitative studies concentrated in the United States (Bond, et al., 2022). With an international scope and a mixed methods design to draw on the strengths of both qualitative and quantitative inquiry, we hope to provide insights into the impacts of motherhood on doctoral research/ers beyond geographic and disciplinary bounds. These broader findings may be used as a platform to propel local and contextually-reflective discussions, and in turn inform research and policy directions that serve to a) acknowledge and harness the ways in which

motherhood can enhance doctoral research, and b) reduce the additional and inequitable strains faced by PhD mums.

### **Motherhood in doctoral education**

Enrolling in a doctoral education program generally requires the completion of an undergraduate degree, and in many countries also a postgraduate degree. Across member countries of the Organisation for Economic Co-operation and Development (OECD, 2019), the average age to enter a doctoral program is 29, the majority of new enrolments being between 26 and 37 years old. The expected length of candidature varies across countries but is generally between four and six years, although actual completion rates are influenced by disciplinary norms and student characteristics (Torka, 2020). This means that many doctoral researchers progress through their doctoral programs in young and/or middle adulthood. As a result, they are likely to simultaneously occupy other roles in addition to doctoral researcher, such as employee, partner, carer, and/or parent, each with a socially-defined “set of rights, duties, expectations, norms, and behaviors” (Barnett, 2014, p. 1).

Reflecting broader societal trends toward gender equality, there is increasing representation of women in higher education in many parts of the world. Just under half of doctoral students across both OECD countries (47%) and the European Union (48%) are women, although this is not uniform across countries or disciplines (Sumpter & Sumpter, 2021). Thus, it should be no surprise that countless doctoral researchers are also navigating the complexities and challenges of motherhood, or a mother-like role (for brevity, we refer to these individuals as PhD mums). This is not to say that it is only women who may experience motherhood; our conceptualisation of motherhood is not tied to binary notions of motherhood or womanhood, and is inclusive of the plurality of notions of what it means to be a mother or to take on a mother-like role (Baltes-Löhr, 2021). This is also not to disregard the challenges that doctoral researchers who are fathers face in balancing dual roles (McAvoy Jr & Thacker, 2021).

Our focus in this study on mothers is both intentional and necessary. In academia, there is a gendered impact of parenthood on researchers (Correll et al., 2007; Morgan et al., 2021). A broader assumption by some employees that women “are going to be too busy looking after their kids to devote themselves to the job” has shown to have real-life implications on job offers, starting salaries, and promotional opportunities, regardless of parental status, a phenomenon known as the ‘motherhood penalty’ (Correll et al., 2007, p. 1297). The role of mother is seen as “incompatible” (Broghammer, 2016, p. 17) and “conflicting” (Pément, 2013, p. 9) with doctoral research in a way that fatherhood is not. The motherhood penalty is manifested in various ways. For example, PhD mums may experience higher attrition rates (Rockinson-Szapkiw & Watson, 2017), and slower career progression (Mason & Goulden, 2004). There are numerous reports of mothers facing exclusion from and discrimination within doctoral programs (LaFollette, 2016; Wladkowski & Mirick, 2020). That motherhood is seen as a liability in doctoral education is something that is often subtle or hidden and thus not easily quantifiable, but is supported by numerous anecdotes of women being advised to wait until securing a tenured position before starting a family, while others have felt it necessary to hide pregnancy and adoption plans (Crawford & Windsor, 2021). A quick online search results in multitudes of entries in online forums of doctoral researchers asking about if, when and how to tell their supervisors about their pregnancies. Other common questions revolve around the best timing for having children, suggesting that doctoral education can impact intimate life decisions.

### **Roles and role theory**

Numerous studies have theorised the various impacts that multiple roles can play on individuals. Sociologist Robert Merton (1957) describes role theory as the psychological and interactional aspects of members of society. According to the scarcity model of role theory (Goode, 1960), time, energy, and other resources are finite, and therefore individuals occupying multiple roles often experience role strain in the form of conflict or overload. Role conflict arises when the demands of one role contradict with the demands of another. In

Goode's (1960) framework, attention is placed on the entire system of roles, rather than any one role, and suggests that individuals make adjustments and bargains in order to reduce strain. When role conflicts cannot be balanced to offset strain, role overload -when demands exceed an individual's resources- can result (Marks & MacDermid, 1996).

It is important to acknowledge that the experiences of multiple roles has been found to be highly gendered (Simon, 1995). Thus, while parenting is a physically and psychologically demanding role, studies around the world have shown that mothers assume a larger share of child care and household duties, even when they work full-time (e.g. Bianchi et al., 2000; Canelas & Salazar, 2014), and this systematic inequality has been compounded in recent times during the COVID-19 pandemic (Zamarro & Prados, 2021). For doctoral researchers, there are strong and untenable pressures to commit fully and completely to one's research. For example, in a Nature survey of more than 6000 graduate students (Woolston, 2019), around half of participants agreed that "the culture at my university calls for long hours and sometimes working through the night", with 76% working more than 41 hours per week, including over 20% working more than 61 hours per week. These expectations actively exclude anyone who is not "an autonomous individual unencumbered by domestic responsibility" (Leathwood & O'Connell, 2003, p. 599). Interestingly, 2019 is the first year in the Nature survey's ten-year history that questions about carers were included, another indication of their marginalisation in doctoral education discourse.

This is not to say that occupying multiple roles is (or has to be) entirely negative. According to the enhancement model of role theory, multiple roles "can be enriching because of the cumulative rewards and the differential allocation of cathexis to several roles" (Spreitzer et al., 1979, p. 142). It can bring positive health outcomes (Barnett & Marshall, 1991) as well as increased self-esteem and sense of identity (Thoits, 1983). This is important because it is common for mothers to experience a "fracturing of identity wherein [they] lose or have compressed selves" after becoming mothers (Laney et al., 2015, p. 138).

## Materials and methods

This study is guided theoretically by the concepts of role strain and role enhancement (Goode, 1960), as two opposing (but not mutually exclusive) potential outcomes of occupying multiple social roles. Methodologically, we are informed by a lived experiences framework, based on the idea that those who are most knowledgeable about a particular phenomenon are those who have experienced it first-hand (van Manen, 1990). The study employs survey methodology, with a sequential explanatory survey design, which involves “collecting and analysing first quantitative and then qualitative data in two consecutive phases within one study” (Ivankova et al., 2006, p. 4). This method allows us to gain important contextual and descriptive data, while at the same time capturing the diversity of participants’ experiences from various contexts, and the anonymous delivery may encourage disclosure of sensitive topics (Braun et al., 2020).

The online survey was designed by Mason and Bond, with critical feedback provided by Ledger, and five pilot participants who provided suggestions for improving the participant experience and/or the methodological rigour of the instrument. The survey comprised four sections. The first two sections aimed at gathering contextual details about participants’ doctoral research, and about their family situation. Section three included Likert items and open-ended questions related to the participants’ first-hand experiences, while the fourth section was similarly structured with a focus on support for doctoral researchers. In this paper, we report on the results of the first three sections.

To meet the aims of our study, we sought participants who at the time of data collection were undertaking doctoral education, or who had completed their degree in the previous five years. While we have used the term ‘PhD mums’ as a form of shorthand to describe our study and its participants, our criteria for inclusion were flexible. Thus, the study was not delimited to those in PhD programs, with participation extended to doctoral researchers engaged in any

terminal degree, including professional doctorates. Similarly, the term mother is inclusive of anyone who has or had responsibility for the care of at least one child for at least part of their doctoral program. We did not apply any further criteria, and sought to identify doctoral researchers from any country, institution, or discipline, although the design of the study means that participants are limited to those with the requisite English language skills and computer access.

Active recruitment took place during September and October 2020 upon ethical approval (Murdoch University, Approval Number XX). The recruitment procedures included a range of proactive strategies to locate hidden participants, as recommended by Neuman (2011), in this case hidden because there are generally no available national or institutional databases of doctoral researchers. The result of these recruitment efforts was collection of data from 1,323 PhD mums in 112 countries and regions. The ‘average’ participant in the study is a currently enrolled, full-time, domestic student in their thirties, researching in a Humanities and Social Science (HASS) field. An overview of the participant characteristics is provided in Table 1, with some additional details provided in Appendix A. We are unable to provide case-level data due to a need to preserve anonymity (Coffelt, 2017), particularly for those in countries and disciplines with comparatively smaller numbers of doctoral researchers and/or PhD mums.

Table 1.

*Overview of participant characteristics, n=1,323*

Characteristic	in sample		Characteristic	in sample	
<i>Age</i>			<i>Graduation status</i>		
20-29	88	7%	Currently enrolled	972	73%
30-39	748	57%	Recent graduate	351	27%
40-49	413	31%			
50+	74	6%	<i>Duration of candidature</i> <i>(actual or expected)</i>		



<i>Enrolment status</i>			0-4 years	598	45%
Domestic enrolment	1068	81%	5-9 years	680	51%
International enrolment	233	18%	10 years+	33	2%
No response	22	2%			
			<i>Nationality/ies<sup>2</sup></i>		
<i>Study work-load</i>			Africa	114	9%
Full-time	827	63%	Americas	174	13%
Part-time	343	26%	Asia	235	18%
Mixed	90	7%	Europe	442	33%
On leave	42	3%	Oceania	250	19%
No response	21	2%			
			<i>Location of program<sup>2</sup></i>		
<i>Broad field of study</i>			Africa	63	5%
HASS	853	64%	Americas	362	27%
STEM <sup>1</sup>	462	35%	Asia	143	11%
Crosses both fields	4	<1%	Europe	467	35%
No response	4	<1%	Oceania	314	24%

<sup>1</sup> Science, Technology, Mathematics and Engineering

<sup>2</sup> More than one response possible, as defined by United Nations Statistics Division (1999)

In terms of family, PhD mums were responsible for the care of an average of 1.85 children and a mode of two children, with a range from one up to eight children. We asked our participants to share the life stages of children that they cared for during their doctoral studies. Table 2 shows that half of all participants cared for a primary school age child during their candidature, and close to half were (also) responsible for the care of infants. Note that these results do not reflect the number of children, with one child likely passing through different stages during the length of a participant's candidature.

Table 2.

*Life stages of children that PhD mums were responsible for during candidature*

Infant	Toddler	Preschool age	Primary school age	Secondary School age	Young adult	Adult
580 (44%)	549 (41%)	546 (41%)	656 (50%)	315 (24%)	83 (6%)	15 (1%)

When the survey closed at the end of October 2020, the data were downloaded and prepared for analysis. First, the contextual characteristics were analysed descriptively to develop a profile of the participants both individually and collectively. Then, for each scale item, frequencies and means were calculated and Cronbach's alpha was calculated to determine the internal consistency of the items. The reliability coefficient of all items was  $\alpha = .881$ , decreasing to no lower than  $\alpha = .854$  when removing single items, indicating close to 'excellent' consistency (George & Mallery, 2003). Non-parametric tests were conducted to investigate any relationship between the participants' characteristics (Table 1) and scale responses. As advised by Mat Roni et al. (2020), this included calculating Mann-Whitney *U* for binary variables, Kruskal-Wallis (H) for nominal variables, and Spearman correlation coefficient (*r*) for ordinal variables. These tests were conducted to identify patterns within the sample, and thus determine differences in how motherhood impacts doctoral researchers between participants with some shared characteristics. Due to the nature of the study these results are not used to make inferences about the broader population of PhD mums, and serve only to develop a broader contextual understanding of the participants.

Next, the responses to the open-ended questions were input into MAXQDA 2022 qualitative data analysis software (maxqda.com), which enables the management and organization of the data and the manual coding process. Qualitative data were analysed using Braun and Clarke's (2006) thematic analysis framework. After becoming familiar with the data, codes were applied to describe each segment of data at the semantic level. Our analysis was informed by role theory (Goode, 1960) and so while we explicitly sought examples of role strain and role

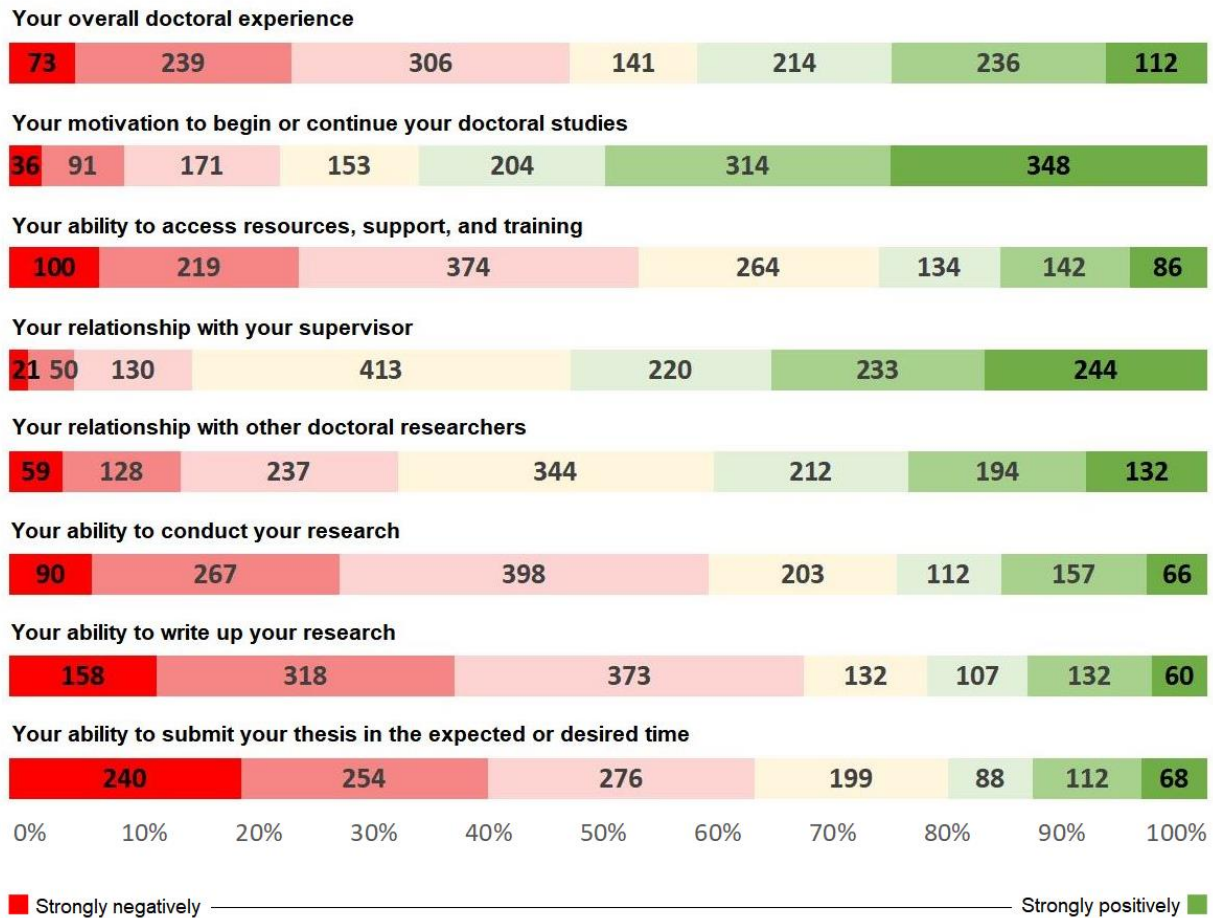
enhancement, the coding was conducted inductively, developing codes from the data itself as opposed to a codebook developed *a priori*. Codes then underwent an iterative analytical process that ended in the identification of themes that “report in detail on meaning related to a central organizing concept” (Braun et al., 2016, p. 236).

## Results

The results of the Likert scale items are shown in Figure 1, which reports valid responses, excluding participants who chose not to answer particular questions (non-responses ranged between two up to 86 participants). The results show that motherhood is more likely to have a negative impact on doctoral researchers’ ability to write up and to conduct their research. On the other hand, motherhood is more likely to have a positive impact on PhD mums’ motivation to begin or continue doctoral training.

Figure 1.

*Doctoral Research Impact Scale item responses: How and to what extent do you think motherhood (has) impacted the following?*



Non-parametric tests showed some significant differences within the sample. In this paper we report results for the 8-item aggregate scale, with results for each individual item provided in Appendix B. More likely to report a more positive overall impact of motherhood on doctoral research were international students,  $U = 102576, p = .000^{**}$ , and full-time doctoral researchers,  $U = 167158, p = .000^{**}$ , while there was no significant difference between HASS and STEM enrolments,  $U = 188995, p = .221$ . More positive responses were dependent on location of candidature, with higher mean ranks by researchers studying in Asia,  $H(4) = 52.459, p = .000^{**}$ . PhD mums who cared for infants,  $U = 191036, p = .000^{**}$ , toddlers,  $U = 183400, p = .000^{**}$ , and preschool age children,  $U = 193876, p = .008^{**}$ , reported more negative impacts of motherhood on their doctoral experience. Older age groups were not significantly related to the intensity of impact, although the impacts remained negative. The age of PhD mums was not correlated to perceived impact,  $r = -.023, p = .406$ , but the number

of children under care was. Specifically, a positive correlation was found, meaning that as the number of children increased, so did the positivity of the responses,  $r = .061, p = .028^*$ , although the strength of the correlation is considered ‘very weak’ (Evans, 1996). (We speculate that this seemingly illogical finding is because those with responsibility for the care of multiple children may be more likely to undertake doctoral education, only if they have adequate resources and support). Finally, the number of children was also positively correlated to (expected or actual) duration of candidature,  $r = .074, p = .007^{**}$ , meaning longer completion times for those with more children.

Responses from the two open-ended questions resulted in a large volume of text, comprising more than 140,000 words. Our analysis procedures resulted in the development of 37 unique descriptive codes. We provide a list of these codes in Table 3 for added transparency, presented in alphabetical order to avoid any suggestion of hierarchy. While we want to avoid quantifying our qualitative data, some overall counts are useful to conceptualise our findings. Firstly, participants were given equal space to respond to the two open questions, with the more positive question strategically posed first. Nevertheless, more lengthy responses on average were given in response to question two related to strains (total 85,590 words) than question one related to enhancements (total 54,814 words). This is reflected in the balance of codes, with twice as many codes related to role strains than role enhancements. Secondly, just over 10% of participants who responded to question one responded explicitly that there were no benefits in combining the two roles, as in “None”, “No benefits at all.”

Table 3.

*Codes developed and applied inductively to the qualitative data*

Codes related to role strains		Codes related to role enhancements
Anxiety, stress, mental health challenges	Lack of facilities and services	Being a role model to younger generations
Challenges to planning, scheduling conflicts	Lack of family support and/or understanding	Bringing different insights to research

Competing priorities	Lack of institutional support and/or understanding	Challenging gender role expectations and inequity
Exhaustion, lack of sleep	Lack of peer support and/or understanding	Confidence and self-worth, identity
Feelings of guilt	Lack of supervisor support and/or understanding	Credibility and respect
Financial strains	Lack of time	Efficiency, focus, prioritisation, organisation, time management
Gender role expectations and inequity	Lack of time for self care	Flexible schedules facilitate time and bonding with children
Impact on relationships	Missing time with children	Increased empathy, compassion, ability to relate to others
Interruptions and distractions	Pregnancy challenges	Keeping doctoral studies in perspective
Isolation and loneliness	Post-partum depression	Motivation to start and continue studies
Judgement and assumptions	Unrealistic expectations	Providing a balance of different needs
Lack of access to formal supports and entitlements		Providing stability and security for family
Lack of adequate childcare		Providing support to other PhD mums

The codes were organised into three broad themes, presented in no particular order with no implication of weighting:

- The demands of both parenthood and doctoral research are intense, but are intensified by additional and inequitable strains placed on PhD mums.
- Lack of support and understanding from (within) the academy is not adequate to relieve the strains on PhD mums, and may in fact exacerbate them.
- PhD mums may possess and/or development a range of skills and attributes that can benefit doctoral research/ers, extending to families and communities.

Because of the nature of qualitative research, we discuss the themes in the discussion section, including illustrative quotes from the dataset. All quotes are presented verbatim except in

some cases where minor edits have been made to promote readability, such as change of tense or corrections to typographical errors. We also draw on our quantitative results to discuss how contextual differences may impact individual doctoral experiences.

## **Discussion**

One of the goals of our study was to include doctoral researchers from and in as many geographic regions as possible, and while we acknowledge that our participants are not representative of the wider target population, and there is a concentration of participants from anglophone countries, there is representation from all continents and more than 100 countries and regions, with more than 1,300 doctoral mothers involved in the study. This makes it one of the largest studies directly focused on the nexus of doctoral research and motherhood, both in terms of its geographic and disciplinary scope, and number of participants (Bond, et al., 2022).

The results of this study highlight considerable variation in how, and to what extent, motherhood impacts doctoral research/ers, which is to be expected in such a large and diverse group of individuals. Being a PhD mum is by no means a universal experience, and it is not our intention to imply otherwise. Nevertheless, by broadening the scope of our inquiry to an international perspective, we have identified some general themes that appear to transcend the various geographic and disciplinary contexts and unique personal journeys of individual participants.

### ***The demands of both parenthood and doctoral research are intense, but are intensified by additional and inequitable strains placed on PhD mums***

The roles of doctoral researcher and mother are both highly demanding, requiring considerable time, financial, physical, emotional, and intellectual resources. The experiences of PhD mums commonly involved periods of physical and emotional exhaustion as they strive to fit in the often competing demands, with limited time and energy.

“I can’t work all hours because I have to feed my children, help them with their homework and be a mum. It also means that I have a lot of responsibilities around the house that I have to fit in alongside my PhD work (such as washing clothes, food prep, and all the other things that go along with having children!)”

Placing inequitable pressure on PhD mums is “the underlying assumption [...] that the child absolutely requires consistent nurture by a single primary caretaker, and that the mother is the best person for the job” (Lynch, 2008, p. 586). This is manifested in various ways. In homes, when parenthood is a shared endeavour, it may not always be shared equitably, with a common frustration being that “most of the household duties still fall largely on me.” This also often includes the unexpected demands that arise when caring for children, “for example, when your child suddenly has a sickness bug and is off school.”

Frequently, PhD mums’ role as doctoral researcher is given less priority than others’ roles, particularly those of male partners. In HEIs it may be seen in a lack of adequate child care and other facilities and services on university campuses that might otherwise communicate acceptance of mothers in the academy. These assumptions about the mother as the “best person for the job” may even creep into the minds of mothers, many of whom shared “feelings of inadequacy” and “incredible guilt” at not being able to commit fully, a guilt applied to both roles, but particularly of “mother guilt.” Recent research suggests that “mothers experience more guilt due to the impact of their work on their family than fathers” (Foucreault, et al., 2002, p. 10).

“The guilt of not spending time with my children or leaving their father to care for them alone while I am working has been overwhelming at times. I feel like



I should be doing more with the kids and that I am selfish for doing my doctorate.”

The assumption that when mothers work it will have a (negative) impact on the family is not extended to fathers whose ‘rightful’ role is as breadwinners and that mothers “should prioritize their caregiver role over their worker role” (Aarntzen et al., 2021, p. 121). This is illustrated by one participant noting that, “my partner felt I prioritized work over being a mother.” Another participant described:

“My partner was also finishing up his doctoral degree in the years after our baby was born and his research and writing somehow always took priority over mine. It meant my work took place in off hours and was on the back burner. I was the primary parent at all times- the feeding, the late nights, the child-related decisions. The gender inequality of being a doc student mother and doc student partner was unimaginable before actually having a baby.”

Role scarcity theory tells us that when the demands of two or more roles become too great, individuals may make adjustments and bargains in order to offset strain that may lead to them leaving their doctoral programs. This study by design involves those who have completed or remained in their programs, and while there were certainly some participants who wrote about the possibility of discontinuing or deferring their doctoral education (“I’ve been challenged with the choice of continuing the program at times when it felt quite heavy”), participants were generally committed strongly to continuing their doctoral studies. In order to meet the demands, then, PhD mums sacrificed rest and relaxation (“I don’t have time to relax. It’s work 24/7”), social and personal activities (“There’s no room for fun or leisure”), and most notably, sleep (“There are many weeks where sleep is sacrificed to balance school work with family responsibilities”). On this last point, lack of sleep and exhaustion was a serious complaint from numerous participants, trapped in a “vicious cycle of sleep deprivation.” Lack

of sleep and exhaustion are not conducive to quality doctoral work; “Academic study of this level needs big thinking, which needs a clear head, and focused creative time. I very rarely had that.” In some cases it impacts the mental health of PhD mums (“Sleep deprivation triggered massive anxiety”).

It is interesting to note that the strains experienced by PhD mums are often felt physically and psychologically, impacting participants directly. This is in contrast to the more abstract ways in which motherhood can enhance the PhD mum experience, as we discuss later in the paper. Our quantitative results also show that motherhood for the most part negatively impacts engagement in the vital processes of doctoral education, including conducting and writing up research, as well as impacting completion times. What is clear is that the sheer fact of daring to engage in further education while also being or becoming a mother, can place PhD mums in a position of considerable disadvantage, but it can also place serious strains on their physical and mental well-being. This is concerning because mental health issues among the broader population of postgraduate students are already alarmingly high (Forrester, 2021).

It must be said that some challenges faced by PhD mums are not directly related to the doctoral experience. For example, PhD mums who experience pregnancy may have to contend with complications and challenges: “pregnancy was the hardest part. I was in data collection when I became pregnant. I was throwing up too much to continue.” Post-partum depression is “the most common psychological condition following childbirth” (Wang et al., 2021), and was reported by a number of participants. Even when family plans (including through adoption) go smoothly, there is a period of adjustment that tests individuals and families in multiple ways. And there are times when circumstances do not go as we plan, and fertility and adoption challenges, miscarriage, stillbirth, and child loss are experiences that come with intense trauma and grief. These are highly taboo subjects in the academy and thus rarely openly discussed (Crawford & Windsor, 2021), and we appreciate that a number of participants shared their intimate stories with us.

***Lack of support and understanding from (within) the academy is not adequate to relieve the strains on PhD mums (and may in fact exacerbate them)***

The previous theme showed that there is often a real and direct impact of motherhood on PhD mums, not only in their progress in their studies, but also to their physical and mental health. They also show that the impacts are not limited to the inherent challenges of parenthood and/or doctoral education, but because of the patriarchal systems that narrowly define each of the roles, with little room to accept divergence from traditional gendered norms. Thus, providing an inclusive and supportive environment for PhD mums requires an active commitment to challenging these norms. While HEIs often espouse a commitment to diversity, equity, and inclusion, there were limited examples where PhD mums were actively and wholly supported by their institutions, or the individuals within them.

Participants provided many examples of the ways in which the idea of the university as 'child-free' is reinforced (Burford & Hook, 2019). A lack of support programs and policies specifically tailored to mothers and carers shows a lack of recognition of the unique physical and psychological challenges faced by a potentially large cohort of doctoral researchers. (Support is also an area of investigation which demands explicit attention and will be the focus of an upcoming paper). It is manifested in some institutions by a lack of facilities. One participant reported multiple challenges in searching for a suitable location to express breast milk, ultimately relegated to doing so in their car, incurring parking fees despite usually taking public transport to save costs. As a result, they "felt ashamed and stigmatised for a basic bodily function of feeding my baby." It is also manifested in many contexts in a lack of adequate parental leave and a lack of (affordable) professional child care.

"Trying to get childcare that was affordable on a graduate student salary was really difficult. There was a small discount at the university daycare but only

enough to make it tied for the most expensive daycare in town instead of heads and shoulders more expensive than any other daycare.”

A lack of support for parents (at either national or institutional level) places some PhD mums in a place of financial precarity, they may take on student loans in order to pay for childcare services, or may undertake additional paid employment (although we note that many participants noted that they also work during their candidature). As one participant lamented, “I feel as though I've been forced to decide between achieving my goals of earning a PhD and future financial security, and that's been a difficult decision to make.” However, even when entitlements are available, there were reports of participants being discouraged, explicitly or implicitly, from taking them: “I was discouraged from taking leave when my son was born and, when I did, was looked upon poorly for it.” Thus, services, programs and infrastructure that purport to support parents and particularly mothers, may not always be available or adequate.

Widespread across the participants' responses were assumptions made by others in the academy about their commitment and ability. One participant, who ultimately decided not to pursue a career in academia on completion of their degree, described that “some ‘higher-ups’, mostly men, essentially wrote me off as a promising researcher once I had a baby.” Some PhD mums also experienced assumptions from peers: “I heard multiple times, ‘She’s probably too busy, she has kids, so I’ll take on that project.’” Thus, PhD mums may miss out on important opportunities because they are not taken seriously or assumed to be unwilling or unable. Additionally, opportunities may be offered in such a way that makes inclusion of those with caring duties logistically impossible - such as scheduling network meetings at night, as just one of many examples. “When other meetings are scheduled during times when I need to be caring for my son (meal times, bed time, etc.) I usually say no I cannot attend, and I feel like I'm missing out.” It can result in explicit inclusion and feelings of isolation:

“Socially, you are not invited to parties with your colleagues, as you are considered an oldie with a child! I see all these pictures from different events and parties on social media from my department that makes me wonder, do I even exist as a doctoral student [...] It definitely [would be] nice to be acknowledged and to join them occasionally, when possible.”

Not wanting to be further disadvantaged, many PhD mums hide or downplay their challenges (“I no longer talk about or bring up my children in any form in my program”) and this puts them in an even more precarious position without support and the solidarity of others (if it was even available to begin with). There is a sense of “your choice, your problem” - actual words uttered by a senior colleague to one of the study participants - without a critical reflection of the misogyny that such a sentiment carries. Further, there is rarely an acknowledgement of the ways in which motherhood can benefit doctoral research/ers, something we highlight in our final theme.

***PhD mums may possess and/or development a range skills and attributes that can benefit doctoral research/ers, extending to families and communities***

Despite the many strains outlined in the previous themes, we also identified a range of enhancements. For example, PhD mums are often highly motivated, as motherhood may provide the impetus to enrol and to persist in doctoral programs. As in, “my children inspire and motivate me to want to be the best version of myself that I can be; I probably would never have enrolled in my PhD program if it wasn’t for this.”

In addition, PhD mums are often motivated by a desire to be a positive role model to their children, showing them the value of hard work and life-long learning, particularly as their status as PhD mums is a challenge to narrow and pervasive gender role expectations. This positive role-modelling also extends to other members of the community, including other individuals within institutions who may be(come) mothers. Some participants noted that they

had “never met another graduate student with a child like me,” and by transgressing the cultural norms, PhD mums are helping to normalize motherhood in higher education and challenging its position at the ‘perpetual peripherality’ of academia (Cronshaw et al., 2022).

On the one hand, motherhood may force a more healthy perspective of doctoral studies as “you have something outside academia which grounds you.” Indeed, many PhD mums reported that the daily tasks of caring for children forced them to or gave them an excuse to take breaks that they might not have afforded themselves otherwise. In this way, motherhood may be a way to subvert the toxic expectations to commit completely to academic life that are harmful for all doctoral researchers (and academics) regardless of the other roles they inhabit.

On the other hand, doctoral education provides a different kind of personal fulfilment. For mothers, being a doctoral researcher can provide connections, resources, certain privileges, status, and ego gratification (Aartsen & Hansen, 2020). While it does not provide the ‘balance’ that is so often lauded as the ultimate (but realistically unattainable) goal, it can serve as a break from the stresses of high-stakes research. From one participant, “The PhD gave me intellectual stimulation and status that being at home with my kids did not give me.” Another notes this ‘balance’: “My son keeps me from an academic burnout, and the academy keeps me from a parental burnout.”

In addition, PhD mums may possess, or develop, a range of transferable skills that are highly valuable in doctoral research, such as time management, organisation, and efficiency. Some participants compared their work approach to their time before becoming a mother: “I think I work smarter now ... I am less of a procrastinator and more focused when I do work”. With multiple tasks to complete within each of their roles, PhD mums may develop an “ability to juggle different priorities and to decide on what is important.” It means that they might “not get drowned in only PhD work which I think helps you manage for the long haul.”

While motherhood is often seen as incompatible with doctoral research, there are many ways in which it can have a positive influence. PhD mums may bring a different perspective to the research, as in, “I do look at concepts and events differently as motherhood has broadened my perspective.” Additionally, many participants reported increased “patience”, “empathy”, and “compassion” that helped them to better relate to research participants, peers, and colleagues. Not only are these attributes beneficial to PhD mums and their doctoral journeys, but also to institutions more broadly.

Mothers engaging in higher education has ripple effects on communities more broadly. Many participants were motivated by a desire to “improve work opportunities and income” and thus “provide for my family,” and at a broader level to “make a positive contribution to the world my child will live in.” Reports in various contexts show that doctoral education brings considerable benefits to individuals, families and societies (e.g. Zolas et al., 2015), and investment in the higher education (more broadly) of single mothers and low-income mothers has particularly high social returns (e.g. Dodson & Deprez, 2019).

However it must be acknowledged that these enhancements are not generally valued in the neoliberal higher education system that values only that which can be quantified. In a profession that is notorious for its often “hostile atmospheres unsupportive of vulnerability” (Smith & Ulus, 2020, p. 840), traits such as compassion, and goals to serve communities, may promote less toxic workplace environments. This is not to suggest that these are unique or inherent to PhD mums, but through their inclusion rather than marginalisation, PhD mums may model a different way of ‘being’ a doctoral researcher and be one part of subverting the “masculine structures and behaviours” that are at the core of academia (Smith & Ulus, 2020, p. 841). (Although, we must avoid placing the burden of addressing patriarchal inequality on women and mothers).

### **Limitations and further research**

This paper reported the findings of one part of a mixed methods study that investigated the experiences of ‘PhD Mums’, those navigating doctoral research and motherhood or mother-like roles. The study is among the largest, in terms of the number and geographic and disciplinary scope of its participants, to focus on the lived experiences of this often marginalized cohort in higher education (Bond et al., 2022). However, and further to the study limitations that have already been acknowledged throughout the paper, the study relied on self-report data, and our focus on breadth of participation limited our ability to gather highly detailed and personalized contextual information that invariably impacts each individual participant’s lived experience.

For many PhD mums, ‘mother’ and ‘doctoral researcher’ are just two of multiple roles they encompass, and further research is needed to better understand how other intersecting identities impact the PhD mum experience. In addition, because the recruitment took place during the early stages of the COVID-19 pandemic, some PhD mums may have been unable to participate. In any case, our study is likely influenced by a survivorship bias, with those struggling under extremely intense conditions less able or willing to participate. An important area of future investigation would be the experiences of PhD mums who left their degrees before completion. We also encourage researchers to use the findings of this study in designing their own context-specific investigations.

### **Summary and conclusions**

By applying Goode’s (1960) bipartite model, we are able to capture the complexities and contradictions of the PhD mum experience. We find that doctoral research impacts the motherhood experience as much as the other way around, and that the impacts extend beyond the individual to programs and institutions, as well as to families and the broader community. Importantly, our findings show that PhD mums can and do make excellent doctoral researchers.



While few would expect combining parenting and doctoral research to be easy, PhD mums are often unfairly impacted by broader social inequities beyond their control. In this paper, we have highlighted a range of ways in which motherhood strains doctoral researcher/s that are common across varied national and institutional contexts. Our participants have shown various ways in which this is manifested in their homes and institutions. In many HEIs there are few policies, practices, or strategies in place to actively counter the inequities faced by mothers in academia, thus perpetuating gendered norms. The unnecessary additional burdens faced by PhD mums may adversely impact their physical and mental health, and their ability to complete their doctoral degree in a timely manner, which should present serious concerns for doctoral supervisors and university and college administrators.

Our findings also highlight various ways that motherhood can enhance doctoral education, at individual and broader levels. Perhaps the most important contribution of this study, from our position as former PhD mums, has been elevating the idea that motherhood is not (or does not need to be) a liability in doctoral education. We found that PhD mums can and do make significant contributions to their various fields, and their inclusion at the highest level of education can also have more profound and long-term benefits for institutions, families, and communities.

We note a distinct contrast between the nature of the strains identified and the nature of the enhancements identified. On the one hand, strains are largely material (e.g. lack of support programs), place PhD mums at a position of disadvantage in their programs (e.g. difficulties attending conferences), and impact their physical and mental health (e.g. exhaustion). On the other hand, the enhancements are by-and-large abstract (e.g. a sense of balance), and undervalued in higher education (e.g. compassion).

Rather than assuming the challenges of motherhood will impede successful completion (when this is rarely assumed of fatherhood), efforts need to be made to negate inequities, and to dismantle commonly-held but outdated assumptions about the lack of commitment and persistence of mothers in doctoral programs (Broghammer, 2016) - and in academia more broadly (Ward & Wolf-Wendel, 2012). It is necessary to acknowledge, promote, harness, and most importantly value the various ways in which motherhood can enhance doctoral research/ers. The active inclusion of PhD mums (and all individuals with a diverse range of experiences beyond those generally centred in academia) serves only to benefit individuals, institutions, and societies more broadly.

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The authors have no conflicts of interest to declare.

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