# The *double-lock*. Academic women's motherhood and career paths.

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## Introduction

The link between the academic path and motherhood remains a disjointed puzzle. The pieces are all, or nearly all, on the table, but we have yet to put them in order, to have a complete overview of how much the decision to become a mother leads to consequences for the academic career, and conversely, how much the academic career has ramifications for the decision to become a mother. The growing attention to the topic is given by clear evidence of gender disparities in academic achievement and the need to fully understand them. In terms of productivity, on average, men publish more papers than women do (West *et alii* 2013). The European Commission's She Figures 2018 revealed that, between 2013 and 2017, the ratio of female- to male-authored scientific publications in the EU was 1 to 2 on average. Differences are present across countries and across domains: Fewer than 6% of countries represented in the Web of Science come close to achieving gender parity in terms of papers published (Larivière *et alii* 2013). Moreover, women are less cited compared with men: When a woman is in any prominent role as author—sole authorship, first authorship or last authorship—a paper attracts fewer citations than in cases in which a man is in one of these roles (*ibidem*). Furthermore, in terms of career progression, the 2018 She Figures report shows that women in Europe accounted for only 24% of total full-grade professors in 2016, with only 1% growth since 2012. The presence of women declines as the academic role increases; while it is almost balanced among doctoral students and graduates, women become a minority as they reach the top of their careers. Together with a cohort effect, given by the reduced presence of women in the overall academic path in the past, there is evidence of gender discrimination, sometimes strictly connected to fertility choices. The coincidence between the years of the formation of an academic career and the central years of fertility plays a crucial role both in the dynamics related to career advancement and in those linked to scientific publications: The combination of time devoted first to maternity and then to childcare can be momentous in determining segregation, and it could be extremely important in explaining the slowdown in women's careers.

The lock experienced by women academics is double. If, on the one hand, the fertility choices may bring consequences for academic productivity and career progression, on the other, the search for

productivity and the progress in the academic career may be a determining factor in defining the fertility choices of academic women. The link between career patterns and fertility decisions has been extensively studied in the sociological and demographic literature. For example, economic and contractual uncertainty and fertility choices are closely linked with a tendency to delay the decision to have a child for those in an unstable contractual position (Kreyenfeld *et alii* 2012; Vignoli *et alii* 2012; Vignoli *et alii* 2019). Moreover, women who tend to invest in their personal work careers can be less prone than others to have children (Hakim 2000; 2003a, Vitali *et alii* 2009). Little is known about the dynamics of fertility among female academics. Contractual instability, economic resources and the choice of a competitive career path that is highly focussed on career progression, with all the effort and commitment that this entails, can have an effect on whether they decide to have children or to postpone or delay fertility plans.

This article aims to investigate the *double-lock*. I present some theoretical considerations that have already been made in the complex connection between motherhood and academia, as well as the main demographic theories on fertility decisions that may help to shed light on the pattern going in the opposite direction. Then, I explore the recent literature on the topic, with an additional specific focus on research on the coronavirus disease (COVID-19). Indeed, the recent pandemic has exacerbated some of the tensions between motherhood and an academic career, as well as those related to fertility choices. Moreover, I show that the Italian case, with its complex academic system and peculiar demographic fertility regime, would be the perfect setting for an analysis of the *double-lock*. Finally, I discuss the need for new data to unravel the *double-lock* (in Italy) and to completely unveil gender disparities in academia connected to motherhood.

**Mothers in the academic world: theories**

There are numerous theoretical perspectives investigating motherhood and the academic career path. Two will be exposed here because they consider different aspects of the relationship between the two forces. The first is the theory of the *maternal wall* (Crosby *et alii* 2004), which describes the difficulties encountered by academic mothers and the implicit and explicit obstacles that stand in the way of (quickly) reaching hierarchical academic positions. The second theory, that of the *gender scheme* (Valian 2005), concerns gender roles that condition behaviour within the academic system, linking these behaviours to the role of care that is replicated not only in the household but also within the academic environment. Finally, since the crucial point of this *double-lock* is looking in the opposite direction—and therefore, at how much the career can affect fertility choices—I briefly outline the main theories that link work and reproductive choices and that may be suitable for future interpretations of what happens in terms of fertility decisions among female academics. I mainly refer to the *New Home Economics* (Becker 1981), *Second Demographic Transition* (van de Kaa 1987; Lesthaeghe 1995) theories, Hakim's *Preference Theory* (Hakim 2000; 2003a, b) and the vast literature on the effects of uncertainty on fertility choices.

Academic mothers face the so-called *maternal wall*: The discrimination and limitations tackled by working mothers (Crosby *et alii* 2004) that make it hard for women to reach permanent, high-prestige positions. The maternal wall consists of stereotypes that women have to face when they become mothers. They can be perceived as low-competence caregivers instead of high-competence workers. At the same time, the maternal wall represents all the obstacles that women face in the need for balancing family duties and their career tasks. The recognition of the effects of the maternal wall in academia is sometimes explicit, but it is often implicit. The She Figures (2018) report, for example, lists factors

hindering women's academic careers that include gender stereotypes, as well as the prevalence of part-time workers and short-term contracts (Milojevic 2018). These second aspects are evidently connected with the need for bargaining and solving the family–work conflict, which has a clear gendered dimension in academia. Work–family conflict corresponds to the 'simultaneous occurrence of two (or more) sets of pressures such that compliance with one would make more difficult compliance with the other' (Kahn *et alii* 1964, p. 19), which makes the pressures of work and family incompatible. Academic women suffer more than men do from the hardships of balancing their family duties and their research tasks (Forster 2000; Santos and Cabral-Cardoso 2008; Woodward 2007). This has consequences not only for their chances of reaching a top position but also for the speed of their path to professorship. Maternity leave is a clear example of a moment in time when women are not devoting time to their career but are completely involved in their family role; the first years of life of the children, with all the care they need—as demonstrated from the literature in the next sections—are potentially crucial in shaping women's academic careers.

While women face discrimination, they combine their work position with their family duties, embodying the maternal role even at work. Women in academia, in fact, face not only practical issues to combine work and private life, but they are also conditioned from their role as mothers in terms of behaviours and career choices during their work time. This is expressed by the so-called *gender scheme* theory (Valian 2005). The idea is that women have a natural predisposition to take on caregiving roles. This also influences the division of labour at the academic level, to the point of making teaching one of the tasks deemed more 'suitable' for women, ultimately favouring men in career paths. This operates at the cognitive level by creating specific cultural expectations (Williams 2005) based on precepts received during childhood and the introjection of behaviours recognised as socially accepted throughout life. Thus, a spontaneous inclination towards teaching would fall among the behaviours that are culturally defined as feminine; in contrast, men are likelier to be considered for their research skills and management of leadership positions, which are linked to masculinity (Bellas 1999). Specifically, in this theory, empathy, listening, emotionality and caring are feminine traits that refer to roles related to teaching. At the same time, assertiveness, autonomy and logical capacity are masculine traits that refer to leadership roles—and therefore, to research, given its close link with career advancement (Valian 2005; Williams 2005). Women may tend to voluntarily take on the burden of subsidiary tasks (e.g. writing reports, serving on a committee), despite knowing that no recognition in terms of merit or in the prospect of promotion will come from them (Babcock *et alii* 2017); often, these activities are considered less prestigious and sometimes even invisible (Bozzon *et alii* 2017). The recurrence of this uneven distribution of labour has prompted some scholars to refer to the tasks assumed by women in academia as 'maternal roles' (Hochschild 1979, 2003; Kantola 2008; Eddy and Ward 2015).

Yet, if we look at the other side of the lock, their fertility intentions may be hindered by the perception of work–family conflict and the awareness of a "role incompatibility"—the inability to combine mother and worker roles. In his *New Home Economy* theory, Becker (1981) posits women's labour force participation can lead to a possible reduction in the time for childrearing, with women in the labour market considering working and having children as competing tasks. This can lead to a reduction in fertility. In this sense, there is a cost–benefit approach to the decision to have children that may be unfavourable for academic women: Women with upper occupational positions and higher wages face higher opportunity costs than those with low incomes, whether these costs are actual or potential (Gustafsson and Kalwij 2006). Labour market attachment can also play a role in the decision. The other classical demographic perspective, the *Second Demographic Transition* (van de Kaa 1987; Lesthaeghe 1995), makes this point; especially, the focus on individualisation is crucial. In modern times, women tend to reprioritise career and self-actualisation over family and childbearing. At the

same time, academic women might be a selected group. Childfree women—women who do not consider motherhood part of their life plan—might be overrepresented among academics. Academic women, as an example, may invest a lot in their career and be among the women who are identified as 'career oriented', giving value to a life devoted to work, in Hakim's *Preference Theory* (Hakim 2000; 2003a, b). Career-oriented women are more present among highly educated women, and they are often unmarried and without children.

However, whether these theories are suitable for explaining fertility behaviours of academic women has hardly been demonstrated yet. The role of the academic career, with its intrinsic uncertainty during the period of women's fertility, may also have an effect. Labour market uncertainty has recently been introduced as a game changer in the definition of the fertility behaviours. Women with an uncertain occupational role tend to postpone or even renounce the idea of having children (Kreyenfeld *et alii* 2012; Vignoli *et alii* 2019; Novelli *et alii* 2020). Economic uncertainty plays a role on personal life also among academics, leading those with precarious job position to delay life-projects, such as family planning (Giorgi, Raffini 2015). The phase of uncertainty in the academic labour market often coincides with the crucial years of fertility (Ward, Wolf Wendel 2004; Nikunen 2012), possibly driving to a reduction in fertility among academic women. All these diverse dimensions (growing economic resources, labour attachment and uncertainty) deserve to be studied in the complex connection between academic careers and fertility choices.

The next section considers which advancements have been made in international research to test the effects of motherhood on academic careers, as well as the fertility behaviours of academic women.

**What do we know about motherhood and academics from recent literature?**

The effect of having children on academic performance has been extensively studied. Mason and Goulden (2002) show that men having a child within five years of their PhD in the US are 38% likelier than women peers to achieve tenure. Mason and colleagues (2013) also showed that, even if mothers with young children do enter tenure-track positions, they are still less likely than singles and fathers to achieve tenure. In general, they confirmed that family formation adversely affects women's academic careers. In 2008, the same research group (Wolfinger *et alii* 2008) also showed that marriage and children have a negative and independent effect on the chances of women entering a tenure-track professorship. When the focus is on publication, there is some old and recent evidence on the role of fertility histories on productivity. The negative effect of young children on women's publication was already found in the 1990s (Long 1990) and confirmed in several more recent studies: Ginther and Shulamit (2004) find a gender gap because of motherhood in economists' publications. Other scholars have found such a gap in the overall academic system (Mason *et alii* 2013; Rivera 2017). Stack (2004) explains that young children are especially detrimental to mothers' productivity. Other studies have tried to detect additional dynamics; for instance, Krapf and colleagues (2017) suggest the presence of a motherhood penalty for mothers of two or more children. In a recent analysis of the publication gap of a specific group of academics (German academics in the field of sociology), Lutter and Schröder (2020) show that children depress the publications of women but not men, and if parents overall publish less than childless academics do, only mothers who received awards before maternity maintain the same level of publications as before the maternity; for men, there is no distinction among fathers according to their ability to obtain grants or awards. Together with the effects of children on productivity, there is a line of research that focusses on care duties. The literature confirms that the work–family conflict

among academics has a clear-cut gender distinction, with women suffering more of the hardships of balancing their family duties and their research tasks (Forster 2000; Santos and Cabral-Cardoso 2008; Woodward 2007). Female academics perform more household labour than men do (Schiebinger *et alii* 2008). In general, those who have care duties have an additional disadvantage with respect to the childless in all the academic achievements (Santos and Cabral-Cardoso 2008; Bozzon *et alii* 2017). Mason and Goulden (2004) confirm that gender inequality permeates both the work and home environments for academic women. They find that, compared with academic fathers, mothers report less time or mental space for writing and are more likely to miss professional development opportunities because of childcare commitments. This double bind of gender inequality at work and at home results in academic mothers receiving tenure or promotion less frequently than fathers do. In a sample of 30 000 academics with young children at the beginning of tenure-track jobs, Mason and Goulden (2002) find that only 53% of women achieve tenure, compared with 77% of men with young children. Finally, regarding the different roles played by women in academia, there is an asymmetry in time use, with women more devoted to teaching duties than men are: In a recent study, Miller and Roska (2020) show that men have more time than women do to devote to research, build work networks and creating collaborations, while women are more harnessed to teaching and bureaucratic roles.

Few international studies have considered how academic career directions affect fertility. Analyses are mainly focussed on the US case. Gender differences in childbearing among academics show women being less likely to have children than other women or their male peers (Perna 2001; Mason, Goulden 2004). Mason and Goulden (2004) show that only one-third of women who take fast-track university jobs, that is, those who choose to invest in work more than in family construction, ever become mothers. Comparing the gendered fertility patterns among academics and other professionals in Sweden, Stanfors (2014) finds that academic women are among the least likely to have either a second or a third birth once they have started childbearing. The author explains this pattern in relation to the difficulties in combining work with more than one child among women who are in a rigid fast-track hierarchy job, with constant pressure to produce measurable results and output. A recent article focussing on Chinese academics goes in the same direction, explaining that those who are not in a fixed-term position have higher fertility intentions than those who have a permanent position because of the work pressure of the women in the second group (Li, Shen 2020). To the best of my knowledge, there are no studies on the diffusion of the childfree among academics.

The next section illustrates how, during the COVID-19 pandemic, the *double-lock* exploded.

## What the pandemic brought to our attention

The recent pandemic seems to have encouraged scholars to pay attention to the inequalities experienced by academic mothers (Minello 2020). While the lockdown measures imposed a new organisation of work and care time because of the impossibility of externalising any care activity, academics never stopped working during the pandemic. The literature has rapidly demonstrated that more women than men have suffered from the new organisation. First evidence on submissions shows that women are submitting articles to scientific journals less than men are (Viglione 2020). There is evidence of such a disparity in all disciplines. In medicine, women published less than men did in 2020 compared with 2019 (Andersen *et alii* 2020). In an analysis of the submissions to preprint servers for some quantitative disciplines, Frederickson (2020) shows that there is an increase of submissions from

both men and women, but those of men are increasing faster than those of women. Amano-Patiño and colleagues (2020) demonstrate that, among economists, young and mid-career researchers, as well as women, are less present in publications on the COVID-19 topic. To understand these disadvantages, two aspects have been studied that are strictly connected to the focus of this article. The first concerns the limitations of time devoted to work because of family constraints during the pandemic, while the second relates to the differences in activities done by mothers during their working time—mainly teaching duties—compared with time devoted by men to other activities—mainly research; this focus on teaching duties rather than research can hinder women's academic productivity and advancement. It has emerged that academic mothers were the ones who struggled the most during the pandemic because they took on greater care, domestic and mental work (Carreri, Dordoni 2020). More than men, women suffered from a reduction in the time they could devote to research (Myers *et alii* 2020). Among the research fields, those mostly hit by the pandemic in terms of research time reduction were, first, those requiring laboratory research, where laboratories were forced to closed during the pandemic, and second, those with a higher presence of women. Having dependents, especially young children for women, was associated with a higher reduction in research time (Malisch *et alii* 2020). Academic mothers had to postpone or discard their research or other tasks because the focus of their activities shifted to teaching duties combined with care work (Minello *et alii* 2020). Motherhood seems to have detrimental effects on women's careers, both because of the difficulties in solving the family–work conflict and because of the time academic mothers more than others devote to teaching duties and mentoring students—at the expense of research.

On the other side of the lock, no studies have focussed on the effects of the pandemic on fertility intentions or behaviours of academics, but the literature on the overall effect of COVID-19 on these dimensions is extensive. The main results seem to suggest that there will be a fertility decline in the future (Aassve *et alii* 2020). Uncertainty is increasing and having new dimensions, such as the medical one. Also among academics there might be an effect of this kind of uncertainty to be summed with the precarious contractual positions of women and the eventual consequences of the pandemic on the academic institution overall (eg. Some projects were suspended or cancelled because of the pandemic). At the same time, the impact of COVID-19 has been diverse among the different levels of education. In an example that is useful for introducing the importance of looking at this country context, Luppi and colleagues (2020) show that, for Italy, there is a higher level of abandoning fertility intentions than there is elsewhere. However, the effect is lower for those with tertiary education and those older than 30. A connection between the level of education and the resilience of some labour sectors during the pandemic might be hypothesized. However, the academic women in the process of making fertility choices and with unstable careers, might be a peculiar group. This section shows that there is still space to make some hypotheses on what can happen within the academic world with a focus on the pandemic.

## Why Italy can be an interesting case

There are several empirical reasons for Italy to be interesting as a case study of the *double-lock*. If the focus is on the effect of having children on the career and the effect of the career on having children, we must first define some elements. Specifically, it is necessary to explain how career progression takes place in the Italian academic system. Currently, after completing a PhD, Italian academics enter academia either with a research fellowship (postdoc) or a non-tenure-track assistant professorship. The

difference between the two paths is that the first, the most common, does not formally include teaching duties. Before reaching a tenure-track assistant professorship and ending precariousness, academics can be in the previous position for a maximum of 12 years. After the tenure track, there is a professorship (with a two-step, non-compulsory advancement from adjunct to ordinary professorship). Advancement in the career is currently strictly related to productivity. In 2010, a university reform was introduced in Italy, the so-called Gelmini Law (Law n. 240 of 30 December 2010). It provided two crucial changes for academic careers. On the one hand, in the recruitment of research staff, the figure of the fixed-term researcher was introduced[1]. On the other, linked to the first change, there was the introduction of the Abilitazione Scientifica Nazionale (National Scientific Qualification). Achieving the National Scientific Qualification is now necessary to qualify as an adjunct or full professor. This is a non-comparative evaluation procedure managed directly by the MIUR (Italian Ministry of Education, Universities and Research), in which national commissions for each of the academic sectors have the task of ensuring the objectivity of the selection process. These two changes have led to a reduction in female career advancement because of the accentuated focus on productivity to reach the National Scientific Qualification and of a further step of precariousness in the career path. In practice, the introduction of the new fixed-term assistant professor with the Gelmini reform has restricted female access to the tenure track (Gaiaschi, Musumeci 2020; Picardi 2020). The new recruitment has amplified a condition of gender segregation in lower positions (Picardi 2019). Currently, the percentage of women in the Italian academic system appears to be unbalanced. Women are the majority among students and PhD students and then gradually decrease as the hierarchical scale increases. Among full professors, women account for only 24% of the total, while among adjunct professors, they account for 38% (MIUR data 2018 in Picardi 2020). Women are more at risk of being longer trapped in precarious academic jobs.

After briefly defining the path of the Italian academic career and its gendered dimension, the second step is to define the Italian fertility pattern and the interconnection between career and fertility choices in the country. Italy overall has experienced a constant fertility decline since 2010. The country re-entered the so-called lowest-low fertility regime in 2019, with a total fertility of 1.29. The country is characterized by low level of fertility and low female labour force participation. Since the 1980s, the highest level of fertility has been associated with the highest rates of female participation in the labour market (Rindfuss *et alii* 2004). Italy and Greece are the European countries with the lowest female labour force participation rates (OECD data). At the same time, the participation of women in the labour market is strictly related to family dynamics: Women tend to interrupt their careers after the birth of a child. Although these dynamics seem to be attenuated over recent years, especially for highly educated women (for a view of the phenomenon, see Bozzon 2008), they still persist in the Italian system. Compared with the EU28, Italy has a higher incidence of women who have never worked in the labour market to care for their children, at 11.1% compared with 3.7% for the EU as a whole; the pattern, even if reduced, perseveres among highly educated women (Istat 2020). Moreover, according to data from the latest Istat survey (2016), 45.4% of women aged 18–49 are childless. Moreover, 22.2% of childless women declare that they do not intend to have children either in the next three years or in the future; of these, 17.4% are childfree. The share of childfree women is higher among the highly educated. This aspect should be further investigated among academics.

Only a couple of aspects that are crucial in defining the link between career and fertility decisions will be mentioned here—the presence of public care services for children and the gendered division of care within the household. On the one hand, the work continuity of women is hindered by

[1] Type A and type B (rtd-A and rtd-B), one with a three-year contract renewable for a maximum of two more years, the other with a three-year contract that is transformed, after positive evaluation, into the role of adjunct professor.

the general lack of public care services for children and the elderly (Saraceno 1998; 2003). Recent data confirm a structural lack of educational services for early childhood (Istat 2020). On the other hand, the gendered division of care roles in Italy is extremely unbalanced: Care-related work is divided along traditional lines. Together with Romanian women, Italian women hold the record among Europeans for daily family work, at an average of 4.5 hours per day, compared with 1.5 hours for Italian men (Eurostat 2019).

In this challenging country context, the study of academic careers and fertility choices is promising but still underdeveloped. Picardi (2020) expresses the difficulties of academic women to combine career instability with the decision to become mothers. Russo and Minello (2021, in press) confirm that the decision to become mothers is troublesome, in terms of compatibility with the academic endeavour and workload. A recent first quantitative paper on the topic (De Paola *et alii* 2021) shows that promotion to adjunct professor, and hence the end of economic uncertainty, increases the probability of having a child.

The combination of a country undergoing a major demographic crisis with an academic system resistant to gender parity—where there both a drastic gender imbalance in caring roles and a lack of services for those taking on such roles—makes Italy an interesting case study for further investigations.

## Unfolding the *double-lock*

There is a *double-lock* between motherhood and academic progression: On the one hand, the presence of children may bring consequences for academic productivity and career progression. On the other hand, the career attachment, the search for productivity, and the complex dynamics for progressing towards stability may determine the fertility choices of academic women. Both dynamics are important for understanding gender inequalities suffered by women in academia.

The study of these gender dynamics would be interesting at an international level. However, to first unfold the *double-lock*, the Italian academic and demographic system represents a challenging case study. Holding some ideas from international literature, it would be necessary to have national data allowing the study of both the personal trajectories and the productivity and advancement in the careers of academics.

Are mothers and fathers equally productive? Are they less productive than those who are still childless at the same age? To answer these questions, data should include information on the family history of the academics; their civil status; dates of the main demographic events, such as marriage or cohabitation; and the birth of children. However, these are only the basic attributes. At the same time, if the idea is to measure productivity and career advancement, these data should be connected to the archives of scientific publications and career progression.

Are mothers devoting more time to teaching compared with childless women? Has this had additional consequences for their careers? Since we have seen that the role played within the household and within academia is crucial, data should also cover information about the gendered division of care work at home and the time division between research, teaching duties and bureaucratic responsibilities at work. With these data available, it could be possible to verify, for example, whether and how much career advancement is delayed not only by the 'birth of a child' event but also by child care. Literature published during COVID-19 has opened up new avenues of investigation in this direction. Specifically, for the Italian case, the time to achieve the National Scientific Qualification, or even more interestingly, the time between obtaining the qualification and entry into the role of adjunct or full professor—combined with family events—could be another interesting research question.

From the other side of the lock, it would be interesting to determine whether Italian academics postpone or cancel their fertility plans more or less than people outside the university do, and whether the pandemic had an additional impact on these dynamics. As mentioned above, the combined role of personal investment in the career, uncertainty of the system and economic resources should be studied with a gendered lens. The presence of childfree women among academics would be another important focus of research. Along with this, the availability of child care services at the national and local levels, as well as the existing policies related to motherhood—but more generally, parenthood—should be considered.

Overall, this paper aimed to unveil the importance of looking at the link between maternal and academic life from a double perspective. The reason for this viewpoint is simple: We cannot really understand a phenomenon if we limit our point of observation to one direction. Once we study the comparison between academic mothers and fathers or between academic mothers and childless women, we have to clearly apprehend that we are looking at a very specific group of women who decided to face all the difficulties that being a mother in such a competitive world presents. If, as the literature demonstrates, academic women have reduced fertility compared with other professionals, it means that there are some obstacles in the academic system that must be unveiled and then eliminated. If, in contrast, mothers in academia are performing less well compared with fathers or childless women and men, there are other, different or similar obstacles that must be clearly identified and removed. Both aspects together, in fact, compete in determining gender inequalities connected to motherhood in academia. Ultimately, if the final aim is to change the system and achieve gender equality, what we need to achieve first is an overall knowledge of the system itself.

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