Thesis project - Sciences Po Doctoral Programme in Sociology

TIME, MONEY AND PARENTING: EFFECTS ON GENDER GAPS IN CHILD DEVELOPMENT

January 2024

Alex Sheridan
French Institute for Demographic Studies (INED)
alexandra.sheridan@ined.fr
Supervisor: Lidia Panico (CRIS, Sciences Po - CNRS)

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Abstract

Gender gaps in academic achievement exist throughout the school trajectory and are crucial for gender inequalities in adult outcomes such as occupational class, income, etc. It is likely that many factors shape these gaps throughout childhood. This project will explore the role of parental involvement as it interacts with the opportunities and constraints offered by the family's social, economic and cultural environment. Drawing mostly on a comparative approach, made possible by the use of nationally-representative surveys, as well as on more specific questions on the French case, I propose to examine three key research questions: (1) Does parental involvement affect the gender gaps in academic achievement in primary and secondary school, possibly through a differential effect on children's socio-emotional skills? (2) Do constraints such as income and employment opportunities affect parental involvement differently for boys or girls? (3) Does the national context affect these relationships? Can specific policies (I will study French reforms in child benefits and school hours) have an impact? Based on the literature, I expect to find a reduction of gender gaps in maths and a widening of gaps in reading due to parental involvement, explained by more time spent with girls in enriching activities, more egalitarian education models that would particularly benefit girls, and more independence training for daughters of employed mothers. A reduction of gender gaps in maths, favouring girls, would provide grounds for more policies in favour of parental leave and maternal employment.

Different gender gaps exist in academic achievement, some favour girls, while others favour boys. In France, as early as primary school, girls do better than boys in reading (Chabanon and Steinmetz 2018) and are more likely to obtain higher diplomas (Insee 2022), while boys do better in maths from secondary school and are over-represented in STEM areas (Duru-Bellat 1990, Fontanini, Costes, and Houadec 2008). These latter gaps are particularly crucial for gender inequalities in economic adult outcomes (Bertrand 2020).

Many factors shape these gaps throughout childhood. In this project, I will focus on parental involvement—the dedication of resources by the parent to enhance the child's development—and how it interacts with the opportunities and constraints offered by the family's environment, with a focus on financial resources and time availability. Both money and time spent with parents matter for child development. However, how their combination affect development through parental involvement is less clear. In choosing to work more, parents are able to assign more financial resources to support their child, but they also have less time with them, also important for child development (Coleman 1988), and conversely. The result of this trade-off may or may not be positive.

It may also depend on the child's gender, if parents choose to use resources differently for boys and girls, whose development could then react differently. Thus, changes in income, employment and parental involvement may contribute to widening or reducing gender gaps in academic achievement, and they may widen certain gaps (e.g. in reading) while reducing others (e.g. in maths). These effects could be direct on children's educational achievements, but we could also hypothesise indirect effects: here I will focus on the development of socio-emotional skills, which the literature has shown to be favourable for academic achievement and overall development and well-being.

In this project, I plan to examine the following questions: Does parental involvement in childhood differ according to the child's gender? Does parental involvement affect the gender gaps in academic achievement, possibly through a differential effect on children's socio-emotional skills? Do constraints such as income and employment opportunities affect parental involvement differently for boys or girls? Does the national context affect these relationships?

I will pay close attention to trajectories over childhood, looking at parental involvement pre-primary school, and at academic performance from the start of

primary school until the end of secondary school, as lifecourse theory suggests that both parental involvement and its effects on children will evolve with child age. Finally, I will investigate whether conclusions differ based on social class and social, economic and cultural resources.

To provide evidence on these questions, I plan to use nationally representative datasets from different Western countries in a comparative approach. In addition, to provide causal evidence on the role of maternal employment for parental involvement and child development, and to study the impact of more specific policies, I intend to exploit two French reforms from 2013-2014: the *allocations familiales* reform and the *rythmes scolaires* reform, using a regression discontinuity design and difference-in-differences. This would be a key contribution to the literature, as employment and parental involvement are highly endogenous, so that their causal effects are difficult to disentangle.

A life course study of parental involvement, academic achievement and socio-emotional skills

Childhood is a key moment for the internalisation of gender norms (Darmon 2016). Children are easily influenced (Durkheim 1922), especially because the set of possibilities and reactions available to them is defined by the adults they are dependent on (Lahire 2019), and whose influence is made greater by the emotional ties they share (Berger and Luckmann 1966). Children are also more vulnerable to characteristics and changes in their environment (Rutter 1979) because of early brain development (Shonkoff 2003).

Several theories also provide explanations as to why childhood is a key moment to study. Life course models, such as the critical period model or the accumulation model, suggest that exposure (sustained, in the case of the accumulation model) to risk-factors in early life have deeper consequences for later development; and human capital theory explains that, for cognitive development, educational investments are necessary in early childhood (Cunha and J. Heckman 2007).

Although parenting norms and practices are evolving towards a more egalitarian model in terms of gender, research has shown that we still see differences in the way boys and girls are brought up, across different domains of everyday life (Novelle 2006, Rogers and Thébaud 2010, Sohn 2015), for example with regards

to toys (Zegaï 2010), body appearance and physical attitudes (Martin 1998, Court 2010), sport practices (Mennesson 2011), infant literature (Brugeilles, I. Cromer, and S. Cromer 2002), and cultural practices (Octobre 2010).

Much of the literature on parental involvement focuses on once children have started school. Because development in early childhood is highly predictive of later development, some of my analyses will focus on this period of life. I will study pre-school parental involvement and its effects on academic achievement, as well as on socio-emotional skills that are associated with improved academic achievement.

The definition of parental involvement is subject to variation and its measurement is likely to be contingent on social contexts and on the age group of children studied. It has been defined in the literature as "the dedication of resources by the parent to the child within a given domain" (Grolnick and Slowiaczek 1994), as "parents' or caregivers' investment in the education of their children" (LaRocque, Kleiman, and Darling 2011), or as "parents' behaviours in home and school setting meant to support their children's educational progress" (El Nokali, Bachman, and Votruba-Drzal 2010). Other authors have studied a specific aspect of parental involvement without venturing into its general definition. However, it is important to consider what definition is used, either to explain possible discrepancies in past results in the literature, or to explore an additional aspect of parental involvement not yet studied.

What is comprised within its bounds will evolve as the child grows, in line with human capital theory and life course models. Aspects of parental involvement that matter for a child's development will be different right after birth, at the start of school and later on. For instance, in the first year of life, time spent creating secure attachments with parents is fundamental for later development (Belsky 1988), while establishing communication with regards to school concerns is a factor that becomes relevant only at entry into formal schooling. Having a broad definition thus seems essential to capture the full effect of parental involvement.

In line with M. Baker and Milligan 2016's work, I will use a broad definition that allows for evolutions over time, and for the inclusion of "teaching" time and of non-teaching time with the child. Teaching time is directly linked to cognitive skills or to school work, for example singing the alphabet, checking

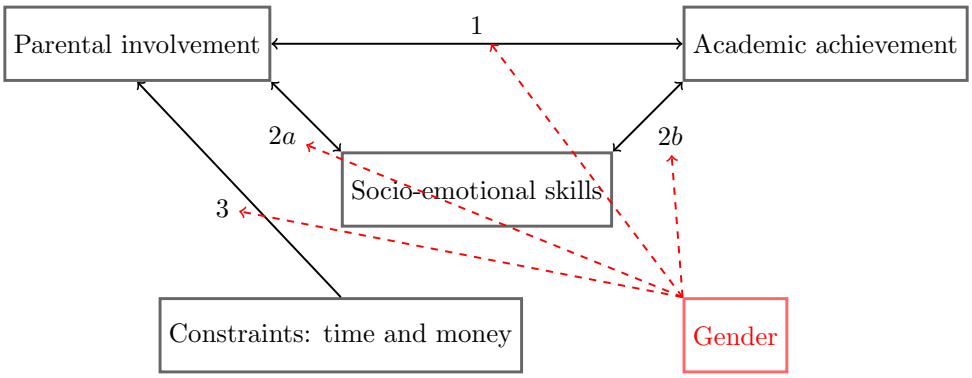
homework, or meeting teachers, whereas non-teaching time has to do with the more general parent-child relationship: it can be be about eating together, caring for the child's basic needs, etc. In addition, I will consider monetary investments, such as paying for activities for the child (outings to the museum, private lessons, etc.) and enriching their environment (with books, etc.).

One aspect of parental involvement that is often overlooked is the degree of parental division of the child's care. I argue that this is key for gender gaps as a more egalitarian division of care between parents might increase daughters' confidence, favourable for their development, and may therefore contribute to reducing gender gaps.

To measure gender gaps in cognitive development, I will examine a broad spectrum of academic achievement, including performance in mathematics and reading from the start of primary school until the end of secondary school. These are measured by tests included in the surveys I intend to use and by national evaluations at school. This comprehensive approach allows me to capture various facets of early-stage learning. Specifically, I concentrate on disparities in scores at the start and at the end of primary school, as gaps in academic performance during childhood have been perceived to persist until the end of school (Entwisle, Alexander, and Olson 2005). To verify this, I will also consider gaps at later stages.

Socio-emotional skills, linked to improved academic performance (Portela-Pino, Alvariñas-Villaverde, and Pino-Juste 2021), may be influenced by parental involvement, potentially varying based on gender. Socio-emotional skills can be defined as functional capacities that allow individuals to work efficiently and persistently, build trusting relationships with others, cope with stress and setbacks (Danner, Lechner, and Spengler 2021). Here, I will observe socio-emotional skills through externalising behaviours and internalising behaviours. Externalising behaviours are negative behaviours toward others (aggression, disruptiveness, defiance, hyperactivity, and impulsivity), while internalising behaviours are negative behaviours directed inward (depressive disorders, anxiety disorders) (Pinquart 2017a, Pinquart 2017b). These measures evolve with child age: externalising will more typically take the form of tantrums in young children, and of theft for adolescents. They also tend to be gendered: on average, boys are more likely to externalise, while girls are more likely to

Figure 1: Theoretical framework



internalise. These are measures that are included in nationally representative surveys.

Gender gaps in academic achievement: mechanisms involving parental involvement

In Figure 1, I introduce a theoretical framework to illustrate the mechanisms around parental involvement that I will explore to explain some of the gender gaps in academic achievement. My main hypothesis is that parental involvement will affect boys' and girls' academic achievement differently, affecting the gender gaps. I will explore different non-exclusive explanations: (1) children's academic achievement responds differently to parental involvement, according to gender; (2) differences between boys and girls appear in the formation of socio-emotional skills, which mediate the relationship between parental involvement and academic achievement; (3) parent involvement is different for boys and girls, in terms of time and monetary investments.

In the first subsection, I describe the relationship between parental involvement and academic achievement (path 1), and how socio-emotional skills mediates this relationship (paths 2a and 2b). In the second subsection, I discuss how employment and income shape parental involvement (path 3). Finally, in the last subsection, I ask whether we might expect parental involvement, constrained by time and money, to differ depending on child gender (effect of gender on path 3) and to affect boys' and girls' development differently (effect of gender on paths 1, 2a and 2b), and how this would affect gender gaps in

academic achievement.

Describing differences hinging on child gender (as illustrated by the dashed lines in the figure) is key to investigate factors affecting gender gaps in academic achievement. Do we find differences on any of these pathways? Answering this question will allow to inform public policy on possible mechanisms to reduce gender gaps.

Does parental involvement affect academic achievement and socio-emotional skills?

On the whole, parental involvement has been associated with improved academic achievement (path 1 in Figure 1), regardless of the definition of parental involvement or of the measure of achievement (Wilder 2014, Castro et al. 2015). The strongest associations are found for developed and maintained communication about school activities, and for expectations and aspirations for child achievement, as children are likely to harbour the same attitudes as their parents'.

However, children who get help with their homework do worse on average (Wilder 2014, Castro et al. 2015). This may be due to reverse causality: children who do less well at school probably attract more help from parents. In estimating the effect of parental involvement on academic achievement, I intend to limit this kind of reverse causality bias by using longitudinal data, that allows for identification strategies less affected by these biases than those allowed by cross-sectional data, often used in the current literature.

Given the evidence on the predictive power of socio-emotional skills for academic achievement (path 2a, Wagner et al. 2020, Schmidt et al. 2020, Steinmayr et al. 2019), I will investigate a mediating effect of parental involvement on academic achievement, through effects on socio-emotional skills (path 2b). Despite their substantial heritability, there is a broad agreement that socio-emotional skills can be shaped by a variety of environmental processes (Danner, Lechner, and Spengler 2021), although we have yet to gain a complete understanding of how best to foster them. There is already some evidence that parenting is associated with children's achievement motivation, self-efficacy beliefs, self-regulation, externalising problems, and internalising problems (Pinquart 2016, Pinquart 2017a, Pinquart 2017b). I aim to assess

whether these associations are causal. In fact, at the moment, it is not possible to exclude that the association may be driven by the influence of the child's socio-emotional skills on parenting. Moreover, I plan to analyse whether these links differ by child gender (Braza et al. 2015), as that would likely contribute to gender gaps in academic achievement.

How is parental involvement affected by maternal employment and income?

Parental involvement, in terms of time, is shaped by parents' employment status, as parents who work outside the home mechanically have less time they can choose to spend in a day with their children. Parental involvement is also affected by income as it limits what resources parents can provide for their child's development (path 3 in Figure 1).

Employment, income and parental involvement are likely to be endogenous. Employment and income affect parental involvement, but it is likely that other (unobserved) variables are driving them all. For instance, a negative relationship between employment and involvement can be explained in two ways: parents who work more have less time to spend with their family because of how much they work (effect of employment on involvement); other variables drive both employment up and parental involvement down, for example parents' interest in their careers, levels of education, income (omitted variable bias). Similarly, both income and parental involvement can be driven by parents' understanding of how the education system functions. Using quasi-experiments, I aim to contribute some causal evidence on the effects of income and employment on parental involvement.

In my thesis, I would focus more on maternal employment than on paternal employment: in recent decades, one of the major social trends has been the growing maternal labour participation. Over that stretch of time, public opinion has become more accustomed to the idea that mothers can work and parent at the same time. However, at least in the US in 2019, concerns were still largely prevalent: only 33% of the public fully endorsed full-time work as an optimal situation for mothers with young children, as opposed to 76% for those fathers (Pew Research Center 2019). To inform public debate, I would therefore be interested in contributing to the literature on the role of mothers'

employment in child development. This does not exclude taking into account paternal employment to understand the larger image.

It is not clear whether maternal employment has a negative or a positive effect on parental involvement. We might expect a young child's development to be hindered by separations from their mother, because they need continuous care for their physical and emotional needs. This "maternal deprivation" perspective puts particular emphasis on the need for the presence of mothers in early childhood (A. E. Gottfried, A. W. Gottfried, and Bathurst 2002). However, children whose mothers are employed have been found to spend as much time with their mothers as children whose mothers are not employed (S. M. Bianchi 2000). The "maternal deprivation" perspective also does not account for the role of fathers, who could become more involved to compensate for mothers' absence.

It is also worth questioning whether time spent with children is of similar quality for mothers employed and for those who aren't. On the one hand, working mothers might struggle to keep fulfilling the demands of their role as mothers, as explained by role strain theory (Goode 1960). On the other hand, work outside the home offers mothers a sense of empowerment as well as a buffer against the stresses of family life and improves her mental health (Hoffman 1989). This is increasingly perceived as impactful for child development (Bodovski and M.-J. Youn 2010).

When exploring the link between maternal employment and parental involvement, it is crucial to consider work intensity, as a mother's engagement in her children's education has been found to be dependent on the number of hours she works (M. Youn, Leon, and Lee 2012), in a non-linear way: compared to non-employed mothers, mothers working full-time are less involved in school-based activities, while mothers working part-time are more. In line with S. M. Bianchi 2000's work though, mothers working full-time compensate with home-based activities: they spend as much time with their children at home as non-employed mothers.

Maternal employment also means more income, which is likely to be beneficial for parental involvement and child development. More income allows parents to invest in their child's education, either by ensuring the child's basic needs, by increasing the child's material resources related to learning, or by providing

more activities, all of which enhance cognitive development and socio-emotional skills (Huerta and Panico 2018, Garcia 2015, Beyer 1995): this is the Investment Model (Francesconi and J. J. Heckman 2016).

More income also leads to improved parental mental health and to less stress in the household, which in turn, affect parenting involvement and child development: this is the Family Stress Model (K. J. Conger, Rueter, and R. D. Conger 2000). We would expect this model to prevail particularly for poorer households, whose security relies on the additional income from maternal employment.

However, for households with more social, economic and cultural resources, or for mothers' whose wages are too low (Agostinelli and Sorrenti 2021), the positive effects of income might not be large enough to offset the negative effects of mothers' absence. In this case, maternal employment is negatively associated with academic achievement, in particular if the child spends time in low-quality childcare instead of their enriched home environment (Brooks–Gunn, Han, and Waldfogel 2002).

Does parental involvement look different for boys and girls? Does it affect their academic achievement?

Income and employment status matter for the conditions parents educate their children in. Facing the same time and monetary constraints (and their potential evolution), do parents make the same choices in investing in their children's development, irrespective of child gender? I will discuss how we might expect parents to use their resources differently, first in terms of time, then in terms of money (effect of gender on path 3).

In Western countries, parents seem to be more involved with boys, time-wise (Lundberg, Pabilonia, and Ward-Batts 2007, Yeung et al. 2001). While in Eastern countries, this male advantage can be explained by an explicit preference for boys (Barcellos, Carvalho, and Lleras-Muney 2014), this explanation does not hold for Western countries, as overall, families prefer having a child of each sex (Angrist and Evans 1996).

This difference in favour of boys is due to more recreational time spent between sons and fathers, starting from birth (Lundberg, McLanahan, and Rose 2007, Raley and S. Bianchi 2006). However, parents spend more time with

girls in activities that more intuitively related to cognitive development, such as reading and playing games (M. Baker and Milligan 2016). If boys receive more time with parents on the whole, but girls receive more time focused on cognitive development, is it unclear whether these differences in parental involvement will boost boys' or girls' academic achievement most and whether, in turn, this will affect gender gaps.

Do these patterns hold for different intensities of maternal employment? If mothers work more, I expect to see differences in how parents choose to use their time at home, for example, by sharing parenting and house work more equally, and reordering different priorities. I also expect these couples to endorse more egalitarian gender role attitudes and train their daughters to be more independent—which serves to boost girls' self-confidence and competence (Hoffman 1980), and in turn, their academic achievement.

On the contrary, I hypothesise that boys' academic achievement will suffer from insufficient parental supervision related to increased employment (Beyer 1995), and I expect this to become increasingly significant as boys enter adolescence, under the effect of peers. Therefore, I will analyse the interaction of gender and age when exploring the effects of parental involvement, in line with a life trajectory approach.

Finally, I expect parents to use their monetary resources differently, for instance when choosing extra-curricular activities (Mennesson 2011) and private education, or when enriching their child's home environment (Zegaï 2010).

Extra-curricular activities promote children's socio-emotional skills and academic achievement (Durlak et al. 2011, Huerta and Panico 2018, Taylor et al. 2017). Qualitative work has shown that boys and girls take part in the sports activities commonly associated with their gender —boys play rugby, girls practice dancing (Mennesson 2011). This can be the result of a combination of factors: the child's wishes, gender norms encountered in the media and in the child's social environment, parents' wishes to reinforce the child's masculine/feminine hexis. These different activities foster different socio-emotional skills: for instance, rugby might particularly encourage a higher taste for competition and more self-confidence, while dancing might require developing more control and self-awareness. These all have implications for children's experiences at school, and for gender gaps. I propose to provide quantitative

evidence on this.

This qualitative work also shows that cultural activities are less split by child gender: boys and girls can take part in similar activities (Mennesson 2011). These activities do not convey gender norms so strongly, so that parents do not feel that their child's hexis is threatened by these activities.

Private education might have an influence on gender gaps in academic achievement. In Western countries, girls have been shown to receive more private tutoring (Safarzyńska 2013, Buchmann, Condron, and Roscigno 2010). "Designed to improve a student's chances of successfully moving through the allocation process" in formal education (Stevenson and D. P. Baker 1992), this type of investment is more directly oriented towards improving academic achievement, but might also affect socio-emotional skills, for example by contributing to the child's self-confidence. This mechanism might contribute to reducing gender gaps in academic achievement.

Finally, how parents invest in their child's environment is likely to play a role in their development. Toys and child literature are highly gendered (Zegaï 2010, Brugeilles, I. Cromer, and S. Cromer 2002), portraying boys' and girls' place in society very differently: boys are outdoors, take part in competition and face danger, while girls are inside—mostly in domestic settings—, show more cooperation and take care of others—mostly their baby. Whether parents put up resistance to these exposures is likely to have an impact on children's gender beliefs, and to affect their academic achievement differently: girls may feel less legitimate in STEM areas if they are assailed by injunctions not to get involved in masculine areas.

Research questions

Building upon the past literature on parental involvement, I aim to explore how it might contribute to gender gaps in academic achievement. The following questions structure my project: (1) Does parental involvement affect the gender gaps in academic achievement in primary and secondary school, possibly through a differential effect on children's socio-emotional skills? (2) Do constraints such as income and employment opportunities affect parental involvement differently for boys or girls? (3) Does the national context affect these relationships?

Data and Methods

Longitudinal datasets

To answer these questions, I plan to use longitudinal datasets. On previous projects, I've gained significant experience with the Étude Longitudinale Française depuis l'Enfance (ELFE) data, with the Direction de l'Évaluation de la Prospective et de la Performance (DEPP) students panel data. These are two large, rich, nationally representative longitudinal datasets. ELFE follows children born in France in 2011 from birth, with very close waves in early childhood. DEPP panels focus on children of school age in France. DEPP has data for children in adolescence, which is not yet the case for ELFE. The ELFE data will soon be linked with DEPP national evaluations; I plan to take advantage of this.

Following children's trajectory over time can be helpful for three reasons: it allows for better causal inference thanks to repeated measures and the use of methods such as fixed effects for example, which is particularly interesting when studying changes in income and employment; it allows to study cumulative effects, for example the effect of long term part-time employment or long term financial deprivation; and it allows to see if effects are different at different points of childhood.

Quasi-experiments

Two quasi-experiments are useful to provide causal evidence on the role of maternal employment for parental involvement and child development in the French context. The first one is the 2014 *allocations familiales* reform that conditioned child allowances on household income. The second is the 2013 *rythmes scolaires* reform that reallocated classes to Wesnesdays for primary school children.

I am particularly interested in the methods used by Elmallakh 2023 and Duchini and Van Effenterre 2022, who've identified a causal increase of maternal employment following both of these reforms. Elmallakh 2023 uses regression discontinuity design relying on the fact that benefit eligibility is based on a two-year lagged definition of taxable household income, as on the short time between the initial discussion of the reform and its final implementation. Duchini and

Van Effenterre 2022 use a difference-in-differences model, comparing cohorts of parents whose youngest child was affected by the reform, and those whose youngest left primary after the reform took place. These quasi-experiments can help better identify the ensuing effects on children's development and on the gender gaps in child development.

A comparative approach

Because the literature is currently very US-centred, it would be particularly valuable to produce results for other countries, in order to test the generalisability of this literature, and study the role of the national context. A few other countries have nationally representative birth cohorts that contain information at different points in childhood. A comparison would be possible with the Millennium Cohort Study (MCS) for the UK, ELFE for France, the National Educational Panel Study (NEPS) for Germany. I would then also like to use the Birth Cohort (ECLS-B) and Kindergarten-First Grade Waves of the Early Childhood Longitudinal Study (ECLS-B and ECLS-K) for the US as a benchmark, to see how other countries compare with the US. These datasets have been previously harmonised and compared in the Development of Inequalities in Child Educational achievement (DICE) project, in which I participated.

Country-specific characteristics are likely to affect the relationship between parental involvement and the gender gaps in academic achievement: parental leave policies, childcare, the structure of the school system and of the labour market, the level of social inequalities (Doepke and Zilibotti 2019), etc. These are some of the factors that could be explored in a comparative approach to identify factors that play a role in gender gaps.

Finally, I intend to develop a collaboration with Prof. Lonnie Berger from the University of Wisconsin–Madison—with whom I have already worked—to explore reforms of the child benefits system in the US, in parallel to the 2014 *allocations familiales* reform in France. Professor Berger has already expressed an interest in this project.

Table 1: Provisional timeline

	Quasi-experiments	Longitudinal data	Literature Review & Writing	Results dissemination
Notes: I am committed to writing all along the way, as "clear thinking can emerge from clear writing" (Montgomery 2017). I also expect to be able to keep co-organising/participating in reading groups and seminars relevant for my research. Lastly, as part of a collaboration with Lonnie Berger, I expect to spend up to a year in Madison, Wisconsin.				
First year				
T1	Study data options & define strategy	Define strategy and questions to be answered longitudinally and comparatively	Literature review around gender socialisation & parental involvement	Present at a seminar
T2		Gather variables to extend harmonisation	Additional reviewing that will likely become necessary	
T3	By the end of year 1, I expect to have identified and requested access to data	Harmonise data		Present at one or more conferences
T4				Apply for conferences
Second year				
T1	Start cleaning data as soon as available	Start first analysis	Additional reviewing	Present at a seminar
T2		Complete first analysis		Present at one or more conferences
T3	Start analyses before the end of the year	Complementary analyses	Stay up to date on the literature	
T4		Start second analysis		Apply for conferences
Third year				
T1	Complete analyses	Complete second analysis	Stay up to date on the literature	Submit to a journal
T2	Complementary analyses	Complementary analyses		If enough time: present at a conference
T3			Complete (re)writing and revisions	
T4				Viva

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