Peer effects in mother groups on female labor market outcomes *

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— Preliminary results - Please do not quote —

Abstract

This paper examines peer effects on female labor market decisions, focusing on whether exposure to a career-oriented peer in a mother group influences mothers' labor market outcomes. We leverage Danish data, where assignment to mother groups after childbirth is universal and random based on geographical proximity and birth date. Measuring career ambition among women of child-rearing age is challenging, but prior research shows that gender norms are transmitted intergenerationally—implying that women with career-oriented mothers are more likely to be career-oriented themselves. To proxy career ambition, we identify mothers whose own mothers held a managerial position. Our preliminary findings suggest that being in a mother group with at least one peer whose mother was a manager increases a mother's working hours and earnings.

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1 Introduction

The roles of men and women have been converging over the last century. Men and women have become more equal in labor force participation, paid hours of work and hours of work at home (Goldin, 2014). Despite this gender convergence, the gender gap in earnings and hours worked continues to be substantial in many countries. A recent literature concludes that after having their first child mothers face an earnings child penalty, which in the long run constitutes a 20 percent earnings gender gap between mothers and fathers (Kleven et al., 2019b). Three margins are at play: 1) mothers experience slower wage growth, 2) work fewer hours, and 3) have lower participation rates compared to fathers.

After the seminal work on economics and identity by Akerlof and Kranton (2000) that highlights the importance of including identity and social norms in individuals' utility optimization, a new strand of economic literature has focused on the role of social norms. The literature generally finds social norms to be of particular importance when it comes to maternal labor. Kleven et al. (2019b) find evidence of inter-generational transmitted social norms, where daughters with more traditional parents are more likely to face a high child penalty when they have children themselves. In another paper Kleven et al. (2019a) show that the child penalty is larger in more gender conservative countries. Using Swiss data Steinhauer (2018) concludes that mothers of young children in gender conservative regions are less likely to work, and women in these regions are more likely to be childless than women in liberal regions. Lichard et al. (2021) estimate the elasticity of substitution of male and female labor in home production with respect to their relative hourly wages close to zero in more traditional couples and societies, and small but positive in more liberal couples and societies.

In this paper, we investigate whether career-oriented female peers can affect new mothers' labor market decisions. We investigate whether this group of peers who share the

same life-changing event of becoming mothers affect labor market outcomes. More specifically, we estimate the peer effect of the peers average working hours and earnings in year 2 to 5 after giving birth on the mother's own working hours and earnings after birth. As the mothers jointly determine post-birth labor market participation, we instrument average peer working hours and earnings by the peers' mothers' working hours when the peers were aged 10-15 years old. We investigate this in a Danish context where female labor participation rates are high and the gender inequality is relatively low. However, the labor market is heavily segregated – compared to men, women are much more likely to work in the more family friendly public sector and work fewer hours. Therefore, we investigate the mechanisms of sector choice in subsequent models.

We are able to not only investigate the effect of being in a mother group with more career-oriented peers on labor market outcomes but also on parental well-being, parental investments (e.g. frequency of activities with child), and child outcomes such as time spend in day care and the children's socio-emotional development.

As motherhood is surrounded by strong norms (Akerlof and Kranton, 2000), we hypothesize that being in a mother group with peers that have chosen to be more career-oriented and oblige less to the traditional gender norms could affect a new mother's labor market outcomes by having relatable peers (that also has just become a mother) with a more liberal gender and parent norms.

Previous studies emphasize the strong influence of peers on maternal labor market decisions (Nicoletti et al., 2018; Welteke and Wrohlich, 2019; Cavapozzi et al., 2021). Nicoletti et al. (2018) find that close family members (cousins and sisters) working hours after having children affect own working hours. Welteke and Wrohlich (2019) find similar peer effects of colleagues' parental leave decisions, and Cavapozzi et al. (2021) show that even just the gender norms of women of same age, education, and ethnicity in a women's area of residence have an effect on a woman's labor market outcomes.

This paper is organized as follows. Section 2 explains the background of the nurse visiting program in Denmark, where mother groups are assigned, section 3 presents the data, and section 4 our empirical strategy. Section 5 shows the results and section 6 concludes.

2   Background

In Denmark, all new families have access to a universal nurse home visiting program (NHV). NHV is a municipal program structured around up to five universal nurse visits within the first year after childbirth.[1] Public hospitals notify the municipality of residence of the mother about the birth. Once notified, all municipalities assign a primary nurse to each family. Thus, families do not have to actively seek nurse care but get the offer to have a family nurse. NHV uptake is very high with 90 percent of families receiving the initial nurse visit scheduled within the first 14 days after childbirth. NHV monitor family health, support infant development, and refer families with needs to other specialist. Within the NHV all new mothers get assigned to a mother group. The mother group comprise of about 5-6 mothers who live close to each other and have recently given birth. Especially, in the population dense areas with more births groups are usually also based on child parity. Based on recent birth, place of residence (and in some instances child parity) mothers are randomly assigned to groups by a nurse who works within the parish where the mothers' live.[2] Historically, mother groups were first introduced in Denmark in the 70'ies to create a safe space for mothers for conversations about becoming a parent, their children, relationships, work life or other things that new mothers have in common. Mother groups are not mandatory to participate in, and after the groups are formed it is up to the mothers

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[1]Additionally, the program includes extra services such as targeted visits for families with need (also during pregnancy and after the first year of the child's life). These extra services are offered at the discretion of municipalities and nurses.

[2]some municipalities form groups based on other criteria such as being a young mother, mothers with signs of postnatal depression, etc.

to arrange when and how often they want to meet. Some mother groups become friends for life and others only meet a couple of times during the maternity leave period.

3   Data

In this project we use three data sources. First, we use Danish administrative registers to obtain information about labor market outcomes such as parental leave, working hours and earnings. Second, we have access to the NHV databases from 62 of the 98 Danish municipalities over the period 2010-2017. The NHV databases include nurse registered information about mother groups assignment as well as mother and child development outcomes such as parental depression scale scores, child height and weight, and child feeding (e.g. breastfeeding, formula or other).

Third, we merge the above two data sources with a large-scale survey on young children: Children's Development and Well-being Throughout Life survey (TRACES). The first wave of TRACES was conducted between October 2017 and September 2018 and included 52,010 children in three age groups: 9 months, 2 years and 3 years. The survey includes responses from both parents one a wide range of themes, such as parenting style, risk behaviors, and parental and child well-being. Using a personal identifier, we are able to merge all data sources on the individual level and combine information about children, mothers and fathers, and grandparents.

We restrict the sample to children born in 2010-2017 that were born in municipalities we have NHV information on. There are 478,551 births in Denmark over the period, where 314,263 of them are from the 62 municipalities where we have access to the NHV databases. We restrict our sample to municipalities where at least 50 percent of the children are registered to a mother group in each year. We make this restriction to ensure that the registration practice is properly implemented within the municipality. Furthermore,

Table 1: Sample selection

	All births 2010-2017	Sample Included municipalities	Group regs ≥0.5
A. Mother characteristics			
Age, mother	30.897	30.811	31.066
Danish, mother	0.808	0.816	0.907
Uni. degree, mother	0.204	0.207	0.218
Income, mother (t-1 gross, monthy USD)	2942.584	2915.893	3359.158
B. Father characteristics			
Age, father	31.632	31.605	31.894
Danish, father	0.824	0.832	0.922
Uni. degree, father	0.179	0.180	0.179
Income, father (t-1 gross, monthy USD)	4010.765	3942.036	4408.142
C. Child characteristics			
Child gender==female	0.487	0.487	0.489
Low birth weight	0.050	0.050	0.043
Preterm birth	0.062	0.062	0.056
Hosp. nights at birth, child	3.484	3.525	3.252
Children	478,551	314,263	92,669

we only include children that has a mother group assigned with between 4-10 mothers (with an average of 5-6 mothers in each group). The sample comprises of 92,669 children and 24,577 mother groups.

In our main analysis, we are estimating the effect of the peers average working hours after giving birth on mother's own labor market outcomes such as earnings, working hours, length of parental leave, sick days and sector choice. Because we are able to merge the three databases, we have a large set of information about how families structure their everyday life. Therefore, we are also able to estimate the effect of peers on outcomes such as gender norms within the family, how much time the child spends in day care, and parental relationship satisfaction.

In our main specifications we include a series of birth outcome variables for child gender, being born with low birth weight, having a premature birth, and nights spend at the hospital with the child. Additionally, we control for the mother's age. All control variables are included for both the mother and for the other mothers in the group (averaged). Finally we control for the time and district of birth and whether it is the first child of the mother. Table 2 shows summary statistics. About half of the mothers are first time mothers. On average the mothers have 1.67 children. Four percent are born with a low birth weight ($<$2,500 grams), and six percent are born premature.

On average the father earns about 27 percent more than the mother in the year before giving birth. About 22 percent of the mothers and 18 percent of the fathers have obtained a university degree in the year before giving birth. Table 3 shows mother group characteristics. Most groups consist of 5-6 mothers. The children are 53 days old, when the nurse registers the mothers to a mother group. The age difference within each groups varies about 77 days from the youngest to the oldest child. The age difference is larger in less populated areas with fewer births and smallest in the larger cities.

About a third of the groups have at least one mother who earns 75 percent or more

of household earnings. In 23 percent of the groups there is a mother, who was in the top 10 percent of the earnings distribution in the year before giving birth. Lastly, there are at least one mother in 7 percent of the groups that have a mother who had a top 10 percent average earnings at the age of 45-50.

4   Identifying peer effects in mother groups

Peer effects happens when the choices of one individual affects other individuals' choices within a group. In this paper, we are interested in how being in a mother group with peer who is career-oriented affects new mothers' labor market decisions.

We follow the empirical strategy by Sacerdote (2001) who estimates peer effects with random assignment. First, we define a treatment variable that is an indicator variable for having at least one career-oriented mother in individual i's mother group.

$$T_{ig} = C_{(-i)g} \tag{1}$$

Where T_{ig} is the treatment indicator of individual i in group g and C is an indicator variable for having at least one career-oriented mothers in individual i's mother group g excluding individual i's career choice. Second, to estimate the effect of having at least one peer who is career-oriented on the outcome variable Y_{ig} we estimate equation (2) using ordinary least squares (OLS).

$$Y_{ig} = \beta_0 + X_i\beta_1 + \bar{X}_{(-i)g}\beta_2 + T_{ig}\alpha + \lambda_g + \gamma_g + e_{ig} \tag{2}$$

X_i is a vector of pre-determined background characteristics for individual i, $\bar{X}_{(-i)g}$ is a vector of identical background characteristics as for individual i averaged over the group but subtracted individual i herself. T_{ig} is the variable of interest, which is an indicator

variable for having at least one career-oriented mother in the group, λ_g and γ_g are date of mother group formation and nurse fixed effects to control for any time-trends and regional differences in the mother groups, as nurses work within a small geographic area. e_{ig} is an idiosyncratic error term. Standard errors are clustered at the group level.

The background characteristics comprise a set of birth indicators for child gender, cesarean birth, preterm birth, low birth weight, home birth, and parity. We also include information about both parents ages, educational level, and earnings the year prior to birth. Lastly, we control for the parents are married or cohabiting, and whether they are of Danish origin.

There are generally two threats to identification of peer effects. Namely, the selection problem and the reflection problem. The selection problem states that selection into peer group is often endogenous and it is therefore difficult to distinguish the effect of peers from selection effects. The reflection problem states that it is hard to distinguish the effect of the peers on an individual from the effect of the individual on the peers if it is determined simultaneously. As we estimate the peer effect of labor market outcomes prebirth, i.e. already before the mother groups were formed. Therefore, by construction the decisions are not simultaneously made.

We test for the selection problem in various ways: 1) we test whether background characteristics of the mother affects the probability of being assigned to a mother group with a career-oriented mother, 2) we run several analyses to check whether results are robust to different sub-samples of mother groups. Additionally, we include nurse district fixed effects in all specifications to account for geographic selection into mother groups. Nurses work in small geographic districts within a municipality, and selection into specific neighborhoods (that will also affect the mother group you get assigned to) will therefore be controlled for. We also include a first time mother indicator and time of birth fixed effects (year times quarter of birth).

5 Results

Results are very preliminary. Below is an outline of planned future analyses with different treatments and outcome variables. This section presents preliminary results for having a at least one mother in the mother group who has a mother who was a manager on both parents earnings and working hours on average the first five years after giving birth.

5.1 Peer effects on working hours and earnings

In Table 1 we show the estimated peer effects of having at least one mother who has a mother who was a manager, when the peer was in the ages 10-14. Meaning we proxy the mother peers own career-orientation by whether they had a mother, who was a manager when they were age 10-14. We estimate the peer effect on both mothers and fathers average monthly earnings and weekly working hours in the first five years after birth. We find that on average mothers earn 80USD more a month if they have a peer with a manager mother in their mother group. Also, mothers average weekly working hours increase by 0.22 corresponding to a 13 minutes weekly on average. We find no effects for fathers.

	Mothers	Fathers
Average monthly earnings in USD		
Peer effect	80.16***	52.91
	(28.03)	(47.31)
Mother w. manager mother	551.6***	345.8***
	(20.00)	(76.60)
Observations	49,714	47,482
R-squared	0.120	0.108
Average weekly working hours		
Peer effect	0.217**	-0.114
	(0.0890)	(0.0818)
Mother w. manager mother	0.931***	0.396***
	(0.141)	(0.134)
Observations	44,512	42,307
R-squared	0.070	0.048

Note: Standard errors are clustered at group level.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.2 Random assignment into mother groups
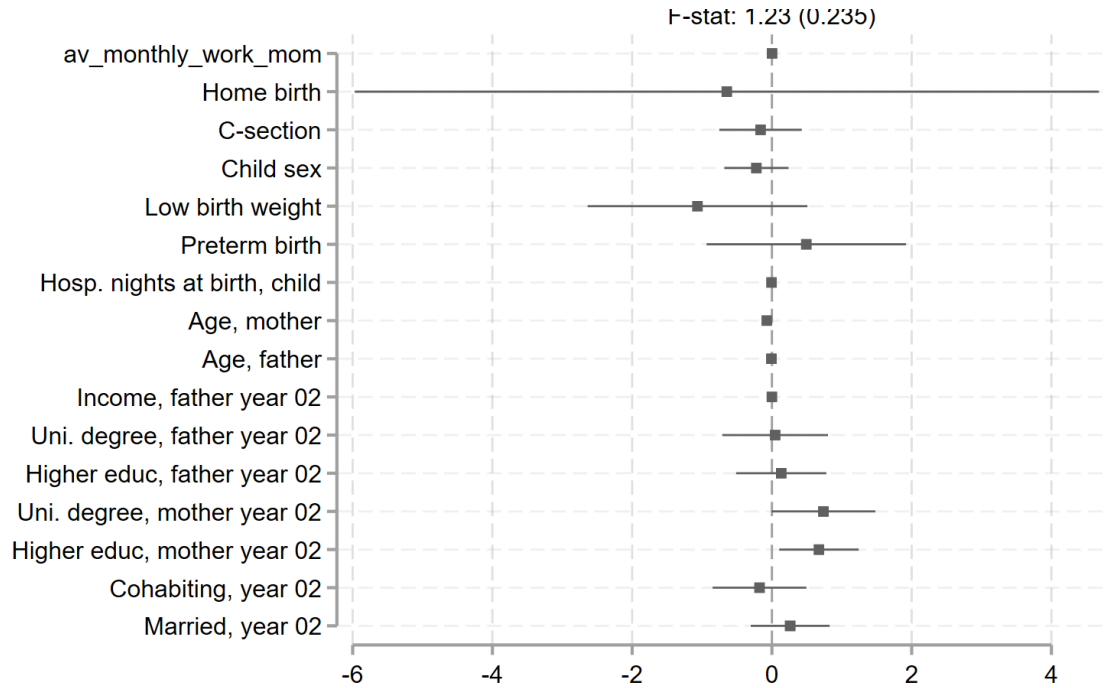
To test whether assignment into mother groups are random given only the period in time a mother gives birth and her living in the area the assigning nurse works, we have tested the significance of all pre-determined background characteristics of the parents and the birth on the probability of being assigned to a mother group with at least one mother with a manager mother. Figure 1 shows the results of the test. We find that none of the background characteristics are statistically significant and the estimates are small. Furthermore, we do not find that the background characteristics have a joint significance on the probability of being assigned to a mother group with at least one peer with a manager mother.

5.3 Outline of future analyses

TREATMENT

- Average working hours of the mother group (instrumented by grandmothers work-

ing hours)

- Average earnings of the mother group (instrumented by grandmothers earnings)

- Peers in the top 10% of the earnings distribution (of both men and women)

OUTCOMES – both in short and long run

Primary labor market outcomes

- Job change from private to public sector

- Length of leave

- Relative hours worked compared to pre-children

- Relative earnings within households

Child outcomes

- Length of breastfeeding

- Age at daycare (TRACES survey)

- Daily hours in daycare (TRACES survey)

- Stimulating activities with child – mother and father (TRACES survey)

Parental well-being

- Parental stress at different ages of the child (TRACES survey)

- Relationship satisfaction (TRACES survey)

  HETEROGENEITY

- Groups with high heterogeneity vs more homogeneous groups

- Groups with varying parity vs first time mothers

- Low vs highly educated mothers

- Rural vs urban groups

6 Conclusion

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