

# Does gender equality lead to higher fertility?

## A study of the effect of fathers' use of parental leave on continued childbearing in Sweden

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### Introduction

The relationship between fertility and gender equality has been of considerable political and scientific concern in recent decades. The most relevant question in the contemporary Western world seems to be whether there is a positive link between the two indicating that greater gender equality is related to elevated fertility (McDonald 2000). The Nordic countries are often regarded as forerunners in these aspects. Several attempts have been made to study this relationship in the Nordic region, including macro and micro level studies, studies of various aspects of planned and actual fertility, studies including a variety of dimensions of gender equality, and studies with a focus on the role of the Swedish parental-leave system in childbearing behavior (e.g., Andersson 2004; Hoem 1990, 1993; Oláh 2001, 2003; Rösens 2004; Sundström & Stafford 1992). Even if some agreement in how to define the processes is reached and a positive association indeed is found, the problem of causality remains. Does gender equality really lead to higher fertility or is the link between the processes due to self-selection of individuals into different modes of behavior?

In this study we extend a line of research where gender equality is narrowed down to the concept of father involvement in childrearing and its association with continued childbearing. In Scandinavia, increased paternal involvement in the care of children has been emphasized as a means to promote gender equality at the couple level and to strengthen the emotional bonds between fathers and their children (Rostgaard 2002). We use fathers' uptake of parental leave to define father involvement and investigate its impact on second and third birth risks. Earlier studies indicate that couples in which the father takes parental leave have higher propensities of continued childbearing (Duvander and Andersson 2006 for Sweden; Duvander, Lappegård and Andersson 2010 for Norway). Our aims in this study are not just to replicate earlier studies with an improved measure of parental leave use and more recent data, but mainly to extend previous research to cover issues of potential causality. We will do this by estimating a joint multi-process model of father's uptake of parental leave and continued childbearing controlling for time-constant unobserved heterogeneity in the processes leading to father's parental leave use and continued childbearing. With these models, we will be better able to study the extent to which the relationship between fathers' parental leave length and subsequent fertility can be explained by the selection of more child oriented fathers into both taking long leave and being more likely to have another child (i.e., selectivity). This will enable a more nuanced understanding of the potential causal links between parental leave use and childbearing behavior.

## **Brief background and setting of our study**

Sweden is well known for its high female labor force participation and, in a European context, relatively high fertility. Swedish family policies do not have a pro-natalist goal but aims to facilitate the combination of paid work and family life. To a very large extent, social policies are individualized. For example, parental-leave benefits are based on the principle of replacement of lost individual income in connection with a parent's leave. This is combined with strong job security during absence from work due to childcare. The system makes it much more beneficial to commence childbearing once a stable position in the labor market is reached, a pattern that most women and men in Sweden tend to follow (Andersson 2000; Andersson & Scott 2005). In recent decades, there has been a shift of focus in the public debate on the parental leave system towards issues of a more gender equal division of childrearing, meaning that fathers' parental responsibilities are emphasized. The arguments used in Sweden and other Nordic countries for a more gender-neutral division of parental leave focus on the need of promoting gender equality both in the household sphere and the labor market, and also on the perceived benefits of the child to have two more strongly engaged parents.

When the Swedish parental leave program was introduced in 1974 it gave parents the right to six months of paid leave from work after the birth of a child. Parents could share the leave as they saw fit and employed mothers and fathers were granted an income replacement of 90 percent of their previous earnings up to a relatively high ceiling. Parents with no earnings prior to the use of the leave received only a low flat rate. All parents permanently residing in Sweden are entitled to parental leave benefits and practically all mothers use leave. Such leave can be used in various ways: full-time, half-time, or quarter-time by either of the parents until the child turns eight. Benefits are paid out of the general tax system with no direct cost to employers. The entitlement period was stepwise prolonged during the 1970s and 1980s. In 1989, it was extended to 15 months of which three months were paid at a low flat rate. In 1995, one month of the leave became reserved for each parent, which popularly has been labeled as the introduction of a "daddy month." The intention was to increase fathers' use of parental leave. At the same time, the leave was individualized meaning that one parent needs the consent of the other to use more than half of the entitlements. In 2002 a second month was reserved for each parent and the leave was prolonged to 16 months. During the 1990s the income-replacement level was stepwise reduced to 75 percent, as public finances were strained, but was raised again to the present level of 80 percent in 1998. The income ceiling did not follow the increase in incomes during the 1990s but was increased considerably in 2005. As parents often claim that economical restrictions determine the division of leave and in practice limits fathers' use of leave the income ceiling may matter in decisions on the sharing of parental leave between parents (Eriksson 2010). Furthermore, to avoid economic hindrance to a gender equal leave use and to encourage fathers' parental responsibility, a gender equality bonus for parents sharing the leave more equally was introduced in 2008.

In sum, the Swedish parental leave system is very generous in terms of income replacement, length, and flexibility. Fathers' share of the leave has gradually increased from around one percent in the 1970s to just over a fifth of the leave today. Especially the first reserved month in 1995 increased the proportion of fathers using any leave from about half of all fathers to today's over 80 percent.

## **Data and strategy**

Our data come from Swedish population registers. They comprise demographic information on all co-residing couples with one or two common children who ever lived in Sweden during the period we study. Our analyses are based on longitudinal register data on social characteristics, parental-leave use and childbearing as contained in the database Sweden over Time, Activities and Relations (STAR). Many of the socio-economic data, including those on parental leave, are available on annual basis. We begin by studying factors associated with the amount of parental leave that fathers take during

the first two years following a first and second childbirth, respectively. We then proceed to estimate the transition rate to a second and third birth with the length of the parental leave use as one of the independent variables. Due to the design of our study, couples who have another birth within the two-year period right after the first or second birth have to be excluded from our data. We use a reference of two years after childbirth because parental-leave data are given on an annual basis and most parents take the main part of their parental leave within that time. Fathers who are active in taking up parental leave are most likely to take the leave towards the end of the couple's parental leave period, that is, during the second year after childbirth. As we only have yearly information on earnings and parental leave uptake, we have restricted our data set to couples with a child born in January. Our sample comprises 26,098 such one-child couples and 27,076 two-child couples. We observe fathers uptake of parental leave during 1993-2005 and the same couples' transition rates to a subsequent birth during 1995-2007.

We estimate three sets of models. First, we present a multinomial logit model of father's uptake of parental leave after the first and the second birth, respectively, controlling for mother's and father's age, education, earnings, country of birth, whether the father has children from an earlier relationship, and calendar period. The dependent variable, father's uptake of parental leave, is divided into four categories: taking no leave (the reference category), 1-30 days of parental leave, 31-60 days of leave, and more than 60 days of leave.

In the next step, we estimate a model of the transition rate to a second and third birth, respectively, using father's uptake of parental leave as the independent variable and including the already mentioned control variables. From this model, we will be able to determine if father's uptake of parental leave is positively associated with subsequent fertility. If it is, it could be that the observed relationship is due to self-selection, assuming that child oriented fathers are more likely to both take longer leave and to move on to have another child in a more rapid pace. Therefore, in the third step, we estimate a joint multi-process model controlling for time-constant unobserved heterogeneity. With this model, we aim at being able to control for unobserved characteristics that may influence both parental leave use and the transition rate to a new birth.

## Results

Results on father's leave taking after the first birth show that the younger they are, the more likely they are to take 1-60 (rather than 0) days. Fathers are also more likely to take more than thirty days the higher is their level of education and less likely to take leave if one or both of the parents are born outside of Sweden. Father's propensity to take leave also increases with his level of earnings, but only up to the ceiling of the replacement level, which is represented by our highest earnings category. It seems that when the mother has an average level of own earnings the father is more likely to use one or two months of leave, while the situation of a mother with very low or very high earnings is related to father's most extended leave use. Also, the higher the woman's education, the more likely the fathers is to take leave. Finally, when the "daddy month" was introduced in 1995, the odds of father taking parental leave of any duration increased substantially. Similarly, when the second "daddy month" was introduced in 2002, the odds of taking leaves longer than one month increased dramatically, giving evidence of immediate effects of policy changes on fathers' leave-taking behavior. Table 1 shows the full results for our model on father's uptake of parental leave in connection with a first birth. The patterns of associations in the case of a second birth are not shown here (yet) but are very similar to those presented in Table 1.

**Multinomial logit model for father's uptake of parental leave, father's days after first birth, Sweden 1993-2005. Odds ratios**

Reference category is 0 days

	1-30 days		31-60 days		61+ days	
<b>Mother's age</b>						
19-24	0.90	**	0.88	**	0.96	
25-30	1		1		1	
31-36	0.88	**	0.90	*	0.90	*
37-43	0.76	***	0.79	**	0.76	***
<b>Father's age</b>						
19-27	1.12	**	1.11	*	0.95	
28-33	1		1		1	
34-39	0.83	***	0.77	***	0.78	***
40+	0.67	***	0.59	***	0.54	***
<b>Mother's education</b>						
Below secondary	0.87	**	0.74	***	0.94	
Secondary	1		1		1	
Tertiary	1.02		1.24	***	1.94	***
<b>Father's education</b>						
Below secondary	0.88	**	0.91		0.93	
Secondary	1		1		1	
Tertiary	0.91	**	1.09	*	1.50	***
<b>Mother's income</b>						
<35,700	0.75	***	0.82	***	1.71	***
35,700-107,100	0.87	**	0.87	**	1.26	***
107,100-178,500	1		1		1	
178,500-267,750	1.03		1.29	***	1.48	***
267,750+	0.71	***	1.17	*	2.30	***
<b>Father's income</b>						
<35,700	0.34	***	0.31	***	0.30	***
35,700-107,100	0.60	***	0.54	***	0.58	***
107,100-178,500	1		1		1	
178,500-267,750	1.64	***	1.73	***	1.91	***
267,750+	1.31	***	1.14	*	1.16	**
<b>Parents' origin</b>						
Both Swedish	1		1		1	
One Swedish	0.65	***	0.70	***	0.74	***
Both Foreign	0.47	***	0.39	***	0.42	***
<b>Calendar year</b>						
1993	0.32	***	0.42	***	0.77	***
1994	0.32	***	0.50	***	0.77	***
1995	1.75	***	1.70	***	1.42	***
1996	1.32	***	1.33	**	1.01	
1997	1.17	*	0.94		0.86	
1998	1.18	*	1.10		0.92	
1999	1		1		1	
2000	1.04		1.07		0.95	
2001	1.01		1.25	**	1.23	**
2002	0.83	*	2.06	***	1.90	***
2003	0.76	***	2.00	***	2.19	***
2004	0.72	***	2.16	***	2.20	***
2005	0.80	**	2.08	***	2.30	***

Significance: '\*'=10%; '\*\*'=5%; '\*\*\*'=1%.

In the next step, we study how fathers' uptake of parental leave is related to the transition rate to a second birth, controlling for all the variables in Table 1 except father's age and adding a variable for the length of the mother's uptake of parental leave.

Results from the hazard regression model (Table 2) show that the transition rate to a second birth increases slightly with increasing paternal leave length in connection with the first birth. Taken together, we find a significantly higher transition rate to a second birth for couples where the father took longer leave than for couples where the father took a more brief leave or no leave at all.

Table 2. The transition intensity to a second birth, by fathers uptake of parental leave (expressed in rr).

	Relative risk	Sign at 5% (**)	1% (***)
0 days	1.00		
1-15 days	1.07	**	
15-30 days	1.10	***	
30-60 days	1.12	***	
60-120 days	1.13	***	
120+ days	1.10	***	

Although we have now established a connection between father's parental leave length and the transition rate to a subsequent second birth, we do not know if this is due to a causal mechanism, where more gender equal behavior actually increases the transition rate to a second birth, or if our pattern merely captures selectivity in behavior. As already mentioned, it could be that men who take long parental leave were more child-oriented already from the onset (and/or less career committed than other men) and that this also is the reason for their elevated propensity to have a second child. Of course, knowing whether this pattern is due to selectivity or causality is important for policy evaluation. In order to try to disentangle this relationship, we will proceed to estimate a joint multi-process model, controlling for time constant unobserved heterogeneity. Our models are estimated using the aML program (Lillard and Panis 2003); the residual (or the heterogeneity component) is integrated out using a numerical integration algorithm based on the Gauss-Hermite Quadrature. The results from these models will be included in the full paper that we propose to present at the PAA meeting. We will also add models predicting patterns in third births (based on the uptake of parental leave after the second child).

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