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**SHARING RESPONSIBILITY?
SHORT- AND LONG-TERM EFFECTS OF SWEDEN'S "DADDY-
MONTH" REFORM**

by

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Sharing Responsibility? Short- and Long-term Effects of Sweden's "Daddy-Month" Reform*

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Abstract

In 1995, the Swedish government reformed the parental leave system with the view to increase the share of fathers in child care, change gender roles in society, and improve the chances of mothers in the labor market. We investigate a unique data set comprising the entire population of Swedish children born in a span of two weeks before and two weeks after the reform. The reform constitutes a natural experiment. Comparing two cohorts of a total of 7600 newborns, their mothers, and fathers over a period of eight years, we look at a) the number of days mothers and fathers take parental leave and b) the number of days for care of sick children. We find that the reform had a strong short-term effect on parental leave by fathers, but that there are no long-run effects on fathers' willingness to increase their part in care for sick children.

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1 Introduction

Sweden is famous for its generous welfare system and its attempts to provide women with equal opportunities. The parental leave system in Sweden provides generous support for parents staying at home with their young children; they are entitled to more than one year of parental leave at a replacement rate of 80% of their prior earnings. In contrast to many other countries (Ruhm, 1998, and Ruhm and Teague, 1997), the same rules apply for fathers and mothers in the Swedish system. Nonetheless, women take the bulk of the parental leave. In 1995, the Swedish government introduced a reform, the “Daddy-month”, which reserved at least one month of the total parental leave available per child for the father. The Government believed that the reform would incite fathers to spend more time with their children in the first years of their lives. It also expected the reform to increase fathers’ shares in child care in the long run, contributing to long-run improvements in gender roles and more equal labor market outcomes:

“It is important that fathers take parental leave. An increased use of parental leave by fathers should contribute to a change in attitudes among managers; they will view parental leave as something natural to consider when planning and organizing the work. This change in attitudes is necessary for both men and women to dare to take parental leave without a feeling of jeopardizing their career or development opportunities at work. Another reason for increasing fathers’ use of parental leave is that women’s prospects of achieving equal opportunities to men in the labor market will be limited, as long as women are responsible for practical housework and children. A shared responsibility for the practical care of children would mean a more even distribution of interruptions in work between women and men, and women would thereby gain better opportunities of development and making a career in their profession.” From the Government Proposition 1993/94:147 to the Swedish Parliament, translation by the authors.

The economic rationale behind this Government Proposition was: First, more parental leave by fathers ought to reduce the scope of discrimination. (For references to economic studies on gender discrimination, see Altonji and Blank, 1999). Second, it should lead to less specialization of female human capital into household and child care work, a rationale related to Becker’s theories of human capital and the family (Becker 1965, 1981). Third, more parental leave by fathers should improve the trade-off faced by firms when

hiring: Firms may be inclined to hire men rather than women, because men are less often absent to take care of children. While the firm does not pay the cost of leave for sick children, work disruptions are costly for firms.¹

We investigate whether the Swedish government was right about the short- and long-term effects of the reform, using a unique data set comprising all children born in Sweden around the time of the reform. These pre- and post-reform cohorts of newborns and their parents are followed over a period of eight years, with 3700 children in the before cohort and 3900 in the after cohort. In a nutshell, we find that the Swedish government was right about the short-term effects of the reform. Fathers in the post-reform cohort, on average, increase their parental leave by 15 days. The percentage of fathers using zero days of parental leave decreases substantially, while there is a large increase in fathers taking about one month of parental leave.

To look at long-run effects, we use data on a second social benefit provided independently of parental leave: Fathers and mothers can take paid leave for the care of sick children up to the age of twelve years. If it were the case that an increase in father's parental leave induced fathers to acquire more and mothers less human capital for the care of children, then, an increase in fathers' shares of care for sick children should be observed in the post-reform cohort. However, the data does not indicate any long-term effect of more parental leave on the allocation of care for sick children. Thus, it appears that the purported link between parental leave and shared responsibility for children does not exist or that the effect of the reform was too weak to have significant effects.

In general, it is very difficult to evaluate the success of reforms in social benefit systems, but our data provides a unique opportunity: First, the data is registry data of the institutions paying the benefit, rather than self-reported. Second, we are not studying a sample, but the entire population of children born in Sweden in a given period of time: The control group comprises all newborns in Sweden in the two weeks before the reform was implemented (1st January, 1995), and the treatment group comprises all newborns in a span of two weeks after. Third, and most importantly, the data stems from a clean natural experiment. The exact birth date of a child is the outcome of a random process and the parents' influence is only marginal.² Thus, we avoid the potential problem of omitted variables, which would make it impossible to distinguish the effects of the reform from correlated influences. As the reform induces an exogenous increase in parental

¹Finally, the government stressed that a close and early contact between father and child was beneficial for psychological reasons. Evaluating this possible benefit of the reform goes beyond the scope of this paper.

²This issue is discussed in Section 4.

leave, any potentially observed long-run behavioral changes of parents in the treatment cohorts should be due to the reform.

The outline of the paper is as follows: The next section provides some background to the Swedish benefit systems for the care of sick children and parental leave and the daddy-month reform. Section 3 describes the data. Section 4 discusses the properties of our data and motivates the use of the natural experiment approach. The effects of the reform are analyzed in Section 5. Section 6 discusses the results against economic theory and concludes.

2 Background

2.1 Parental Leave Prior to Reform

In most OECD countries, there is a tendency to increase the benefits given to families. While the bulk of benefits was initially given to mothers, many countries now try to move away from traditional gender roles (Ferrarini, 2003). Hence, family benefits are now often designed in such a way as to increase the responsibility of fathers for child care, and the labor market opportunities of mothers. As early as in 1974, the Swedish maternity-leave system was changed to a parental-leave system, where the same rules apply to fathers and mothers. In the first year after the reform, men only used 0.5 percent of the parental leave. By 1994, this figure had increased to 11.4 percent. The determinants of fathers use of parental leave have been studied by Sundström and Duvander (2002), but our paper is the first to evaluate the daddy-month reform. Parents are compensated in relation to their earnings for 360 days and the reimbursement rate varies between 75 and 80 percent for the period studied, see Table 1. There was a bonus of 10 percent for the first month of parental leave in the first two years after the reform.

The reimbursement rate is based on prior earnings for the first year after the child was born, and then on an estimate of the wage the parent would get when returning to work. Thus, the compensation will increase after one year, if the wages in the parent's profession have increased during the first year of parental leave. The compensation is limited by a ceiling, in our data 12 percent of the fathers and 4 percent of the mothers hit the ceiling at the time of the daddy-month reform. Parents are also compensated at a low flat rate of 60 SEK/day (approximately USD 8) for 90 days and parents without earnings are also compensated at this level for the 360 days when compensation is based on earnings. The parental leave must be used before the child turns eight or finishes first grade in school, but more than 90 percent of the leave are used during the first two years of the child's life. Only one

parent is allowed to use parental leave at a time, but they can both work part time and use parental leave part time as long as the total parental leave does not exceed full time. Finally, in a separate system, fathers are entitled to 10 days of benefits in connection with the birth, which can be used although the mother is on parental leave. These ten days must be used during the first 60 days after the birth of the child.

Table 1: Reimbursement rates (in percent) in the Parental Leave System 1993-2003.

Year	Reimbursement rate	First month reimbursement
1993	90	90
1994	90	90
1995	80	90
1996	75	85
1997	75	75
1998	80	80
1999	80	80
2000	80	80
2001	80	80
2002	80	80
2003	80	80

2.2 The Daddy-Month Reform

One month is reserved for each of the parents for children born after January 1, 1995. Almost all mothers used at least one month of parental leave before the reform, so in practice, the restriction on the division of parental leave is only binding for fathers, and the month reserved is generally known as the daddy-month. About 30 percent of the fathers used at least one month of parental leave before the reform, about 40 percent increased their use to one month, and about 30 percent used little or no parental leave after the reform. The introduction of the daddy-month coincided with a decrease in the reimbursement level from 90 to 80 percent, a change which affected both groups in the same way.³

³From the first of January 2002, parents are entitled to 390 days of parental leave with two months reserved for each parent. This does not affect the parental leave for children born under the period studied.

2.3 Care for Sick Children

Parents are entitled to government paid time-out due to care for sick children until the age of twelve. The reimbursement is based on current earnings and the replacement rate varies between 75 and 80 percent for the period studied. Parents can benefit from this system up to 60 days a year. Men account for approximately one third of the leave for care of sick children. The share of children cared for by any of their parents on at least one occasion during a year peaks at 65 percent for two-year old children and then gradually declines (RFV, 2002). The average share of children cared for on at least one occasion during a year is about 50%. The average number of days of care by those parents using the system is six for men and seven for women. The data on the care of sick children has the advantage of not being self-reported. The government pays for the benefit, but the employers may incur indirect costs from the worker's absence. The uneven distribution between genders as concerns care for sick children affects the employers more directly than most other differences in the distribution of household work.

3 Data

To construct the cohorts of parents entitled to benefits from the parental leave system analyzed in this paper, we restrict our attention to parents of children born two weeks (14 days) before and after the reform. Hence, only data for children born between December 18, 1994 and January 14, 1995 will be included. Two cohorts (called the before and after cohorts below) are constructed from population data collected by the Swedish National Social Insurance Board (Riksförsäkringsverket). The data is assembled from records obtained from local insurance offices, and covers all parental leave taken between the years 1993-2003. The data contains information on geographical location, the starting date of the parental leave and the extent of days (in shares if not a full day), the amount of the parent's cash benefit, and gender and date of birth for both the child and the parent. To access information for a child or parent, at least one withdrawal must be observed between the quarters 1994:4 and 2003:2, otherwise this information will be censored. As seen in Table 2, almost all mothers used at least some parental leave in both cohorts.

Table 2: Number of Observations and Frequency Observed in Cohorts Two Weeks before and after the Reform.

Sample	Before		After	
	Obs	Freq.	Obs	Freq.
Children	3709		3892	
Fathers	3134	84.5%	3467	89.1%
Mothers	3676	99.1%	3866	99.3%
Both parents	3101	83.6%	3441	88.4%

The cohort size is about 5 percent larger after than before the reform. However, the number of fathers observed in the data increases by about 11 percent. For comparison, results from a reference group of all children born in the quarters 1994:4 and 1995:1 will be reported. Table 10 in the Appendix, shows the number of observations in the reference group. The increase in the proportion of observed fathers is about the same for the reference group, as for the two weeks cohorts.

4 A natural experiment

The time of conception cannot be completely controlled by the parents. Even after conception, the exact birth date of a child is the outcome of a random process. Since the lapse of time for a pregnancy can be regarded as normally distributed with a mean of 40 weeks and a standard deviation of 2 weeks⁴, we have a natural experiment in its cleanest sense, a so-called 'natural' natural experiment (see Rosenzweig and Wolpin, 2000) when we compare the behavior of parents with children born immediately before and after the reform. This means that we avoid the potential problem of omitted variables. Fathers' parental leave and their care for sick children are likely to be correlated for a number of reasons. For example, fathers with a traditional view on gender roles, or with managers with a traditional view, and fathers with jobs where absences cause large problems will all be less likely both to take parental leave and care for sick children. Hence, it is impossible to determine the causal effect of parental leave on care for sick children, unless all these effects can be controlled for. The natural experiment approach avoids this problem, as we have an exogenous change in fathers' parental leave due to the daddy-month reform. For the natural experiment approach to be valid,

⁴In principle, the birth date of the child cannot be postponed, but it is possible to hasten the birth.

there must not be any systematical differences between the characteristics of the two cohorts. Below, we show some data to confirm that this in fact the case.

Figure 1 presents the distribution of the number of children born per day, under the observed periods. The two periods are marked with thin vertical lines around the turn of the year.

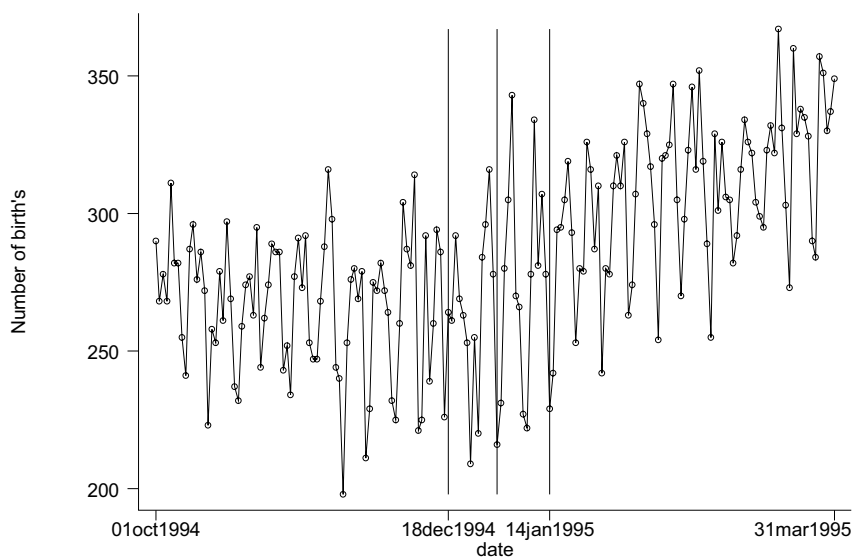


Figure 1. Distribution of Births October 1994 - March 1995.

Figure 1 shows that there are large seasonal differences over time; however, no signs are found of there being any irregular patterns around the turn of years. There is a common pattern that the number of children born in Sweden in a two-week period after the turn of the year is larger than the number of children in the corresponding period before the New Year. This can be seen in Table 11 in the Appendix. To further investigate any systematic differences between the two cohorts, we compare the parents' age distributions, and the distributions of births by county.

Table 3: Age Distributions of Mothers and Fathers, before and after the Reform.

	Before		After	
	Mean age	std	Mean age	std
Fathers	32.00	6.04	31.93	5.96
Mothers	29.17	5.05	29.08	5.14

As seen in Table 3, there are small differences in the age distribution between the samples. A t-test assesses that there is no statistically significant difference in the mean age between the before and after reform parents. Note that important background variables such as level of education and income are positively correlated with the parents' age. A difference between the parents of the before and after cohort in any of these variables would have shown up in a difference in age. This argument may not hold for fathers, as there is missing data on age for a substantial fraction of fathers, but we have age data for over 99 percent of the mothers. The age of the mother and the father is strongly correlated, so a sample selection problem for fathers on, for example, education would show up in an age difference also for the mother.

We have data on the geographical distribution of births and find no systematic differences between the cohorts in this respect either. As seen in Table 12 in the Appendix, the number of births in the Stockholm County is equally distributed around 800, both before and after the reform. Small increases subsequent to the reform can be found in the counties of Östergötland, Skåne and Gävleborg, otherwise the differences are small. To sum up, there is, *a priori*, very unlikely to be a systematic difference in the characteristics of parents in the before and after cohort, and we do not see any evidence of systematic differences in the data.

5 Effects of the Reform

In this section, we will first study the effects of the reform on fathers' use of parental leave, and then investigate if the reform had any long-run effects on fathers' share of care for sick children.

5.1 Parental Leave

As shown in the previous section, we have not been able to find any systematic difference in the composition of the two cohorts of children born two weeks before and two weeks after the reform. Hence, any difference in fathers' use of parental leave should be an effect of the reform. A first step in analyzing this is to compare the mean of parental leave days, for the 360 days when compensation is based on earnings and the additional 90 days when it is based on flat rate.

Table 4: Mean of Parental Leave Days in the Cohorts Two Weeks before and after the Reform.

Sample	Before		After		Mean-diff	t-stat
	Mean	Std	Mean	Std		
Fathers:						
360-days	29.5	61.9	44.2	57.4	14.7	10.8
90-flat	8.0	21.1	9.3	21.8	1.4	2.8
Mothers:						
360-days	323.7	87.3	298.9	80.5	-24.7	-12.8
90-flat	59.9	42.8	63.1	44.0	3.2	3.2

From Table 4, it can be seen that fathers increase their parental leave by about 15 days on average. The increase should be below the 30 days reserved for fathers by the daddy-month reform. Some fathers didn't use their daddy-month and some fathers would have used parental leave without the reform, and would thus not increase their parental leave by 30 days. The number of days used by mothers decrease more than they do increase for fathers, which is also expected, since some fathers do not use the days redistributed from mothers to fathers by the daddy-month reform. There is an increase in mothers use of the 90-flat system, which could be interpreted as some mothers use this less beneficial system when their access to the more beneficial 360-days system is reduced. Fathers increase in the use of 90-flat system is harder to explain. If we look at the three months cohort the increase is reduced to 0.5 days, however. The t-ratio shows there to be a statistically significant difference in the means of parental leave days between the before and after reform parents. The results for the 360 days system are not sensitive to the cohort size chosen and the differences between cohort sizes in the use of the 90 flat system is small. We have experimented with cohorts between ten days and three months before and after the reform and we report some data for the three month before and after cohorts in Table 13 in the Appendix. In total, the use of the 360-days system decreases by 10 days after the reform, and total parental leave for both systems decreases by 5 days.

Table 5: Distribution of Fathers' Parental Leave (360-Days System).

Number of days	Before		After		Difference (Aft-Bef)
	Freq.	Percent	Freq.	Percent	
0 days	1993	53.7	689	17.7	-36.0
0 - 10	396	10.7	171	4.4	-6.3
10 - 20	207	5.6	215	5.5	-0.1
20 - 30	205	5.5	1333	34.3	28.7
30 - 40	139	3.7	482	12.4	8.6
40 - 50	102	2.8	184	4.7	2.0
50 - 60	79	2.1	113	2.9	0.8
60 - 70	77	2.1	95	2.4	0.4
70 - 80	56	1.5	68	1.8	0.2
80 - 90	57	1.5	71	1.8	0.3
90 - 100	42	1.1	48	1.2	0.1
100>	356	9.6	423	10.9	1.3

From Table 5, it is clear that the mass in the distribution is shifted from zero days before the reform, towards an interval of around 30 days after the reform. The fraction at zero days is reduced by 36 percentage points, and the fraction in the interval between 20 and 40 days increased by 38 percentage points. Moreover, the reform seemed to have no effect at all on the distribution of 60 days or more. The mean increase in fathers' use of parental leave distributed over the number of years after birth, is shown in Figure 2.

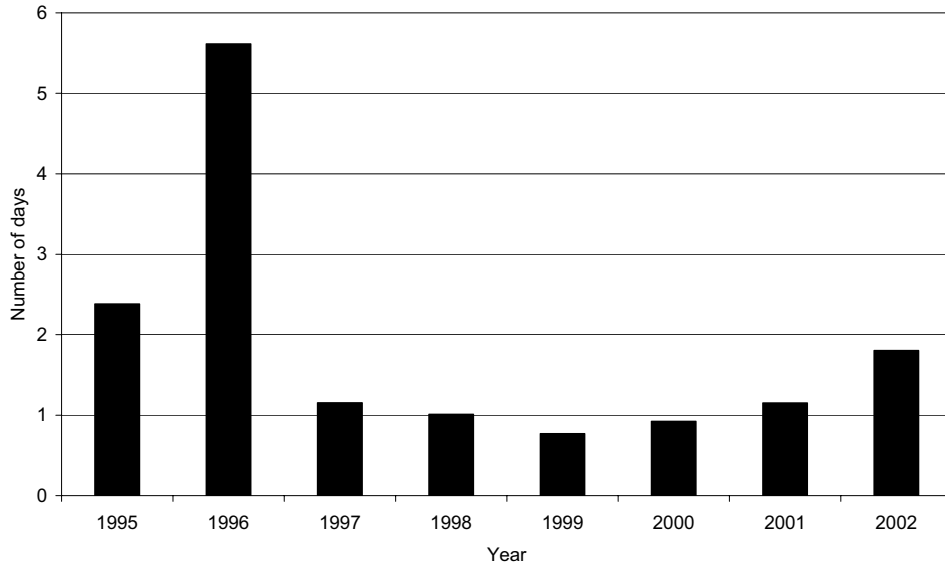


Figure 2. Mean Increase in Fathers' Use of Parental Leave by Year.

From Figure 2, it can be seen that about 50 percent of the increase can be attributed to the first two years after the birth, the rest are evenly distributed during the 1997 to 2001 year, followed by a somewhat larger increase in 2002. The increase the last year may be due to that parental leave has to be used before the child turns eight. For children over the age of two, a larger part of parental leave is used during the months of July, August and December, both for fathers and mothers, and in both the before and after cohorts. A closer inspection of the results in Figure 2 reveals that the increase in parental leave by fathers, for children over the age of two, to a large extent is attributed to an increases of days used in these months.

5.2 Fathers' Share of Care for Sick Children

In this section, we investigate if the increase in fathers' use of parental leave made them take larger responsibility for the care of sick children. The distribution of care for sick children shows a large variation over season and age of child. The fraction of sick children per day is shown in detail in Figure 3.

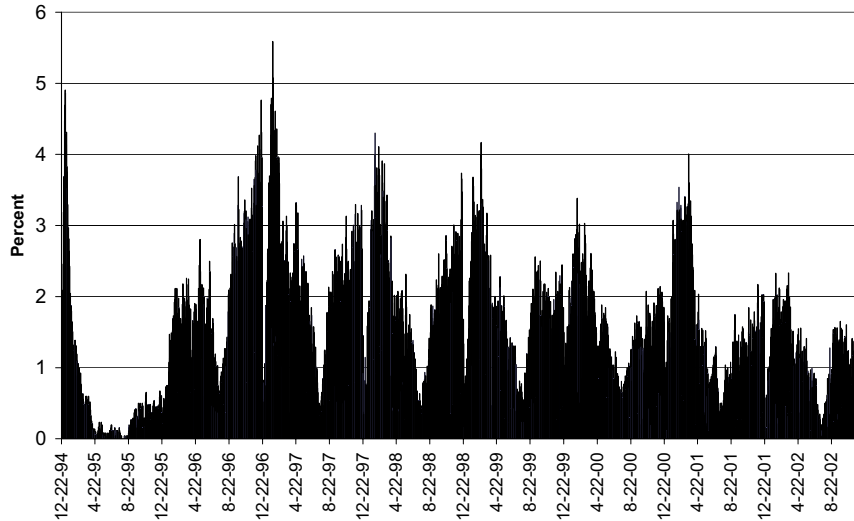


Figure 3. Fraction of Sick Children Per Day (Before Reform Cohort).

The division between parents of the care for sick children is usually not a zero or one decision, since most children are sick on several occasions. The decision of which of the parents should stay at home with a sick child on a certain occasion depends on the problems caused at the workplace by an absence, which could vary from day to day. The (dis-)satisfaction from working could also vary between days. From the data, we know that most parents are in an interior solution where the father has a positive share of care for sick children. The main testable prediction from theory is that increased human capital in housework and child care after the introduction of the daddy-month should lead to a higher share of care for sick children by fathers' in the after group. We use two measures for fathers' share of care for sick children. A) *MALESHARE*, the mean of the share of care taken by fathers, calculated as the number of days by the father divided by the number of days taken by both parents in the family. This variable is restricted between 0 and 1 for each child. B) We also look at the total number of days taken by fathers, divided by the total number of days taken by the parents. The results for measure A are given in Table 6 and the results for measure B are given in Table 7.

Table 6: Mean of Fathers' Share (in Percent) of Care for Sick Children Days, in Samples Two Weeks before and after the Reform.

Sample	Before		After		Mean-diff	t-stat
	Mean	Std	Mean	Std		
Fathers' share:	35.04	32.02	35.52	32.35	0.47	0.60

As seen in Table 6, there is a 0.47 percentage point difference in the means of fathers' share of care for sick children. A t-test assesses that there is no statistically significant difference in the means between the before and after reform cohorts. Using measure B, we instead obtain a small negative effect of the reform on fathers' use of parental leave for the two week cohorts, but looking at a larger cohort, such as the three-month cohort in Table 7, we find no difference at all.

Table 7: Fathers' Share of the Total Number of Care for Sick Child Days.

Year	Two weeks			Three months		
	Before share	After share	Percent change	Before share	After share	Percent change
1995	48.44	38.12	-10.32	49.92	38.01	-11.91
1996	35.01	35.32	0.30	35.25	36.26	1.02
1997	34.32	33.76	-0.57	33.76	33.80	-0.04
1998	35.44	33.83	-1.62	34.04	34.92	0.89
1999	34.16	34.43	0.26	34.54	35.28	0.74
2000	33.77	34.63	0.86	33.17	34.10	0.93
2001	33.12	32.64	-0.48	33.30	33.48	0.19
2002	30.98	31.97	0.99	31.64	32.69	1.05
2003					33.07	na
Total (1994-2003)	34.60	34.15	-0.45	34.58	34.60	0.02

We observe a decrease in fathers' share of care for sick children for the first year, before the child turns one. However, the number of days of care for sick children is low during the first year, because most children are already cared for by a parent on parental leave. For older children, we only see small changes, with mixed signs for different years, in the fathers' use of care for sick children. This pattern is stable to changes in cohort size, see Table 8.

Table 8: Fathers' Share of Care for Sick Children for different Cohort Sizes.

Cohorts	2 weeks			1 Month		
	Before	After	Diff	Before	After	Diff
(1) MALESHARE	35.04	35.52	0.47 (0.60)	35.19	35.57	0.38 (0.72)
(2) Men's share of total number of days	34.60	34.15	-0.45	34.70	34.67	-0.03
<i>N. of obs.</i>	3226	3427		7168	7788	

Cohorts	2 Months			3 Months		
	Before	After	Diff	Before	After	Diff
(1) MALESHARE	34.98	35.33	0.36 (0.95)	34.93	35.44	0.51 (1.71)
(2) Men's share of total number of days	34.50	34.52	0.02	34.58	34.60	0.02
<i>N. of obs.</i>	14182	15595		21561	24500	

We face a trade off for sample sizes. A small sample results in a very clean natural experiment while a large sample increases the efficiency of the estimates, but makes the natural experiment less clean. In the table above, we show the results for cohort sizes between two weeks and three months. For the two-week sample, there is only a 28-day difference in age between the first child in the before group and the last child in the after group. For the three-month sample, there is a six-month age difference between the first and the last child, making it a less clean natural experiment. In row (1), we measure fathers' share of care for sick children as their mean share of care for sick children, *MALESHARE*. There is no significant difference in *MALESHARE* for any of the cohort sizes. In row (2), fathers' share of care for sick children is measured as fathers' share of the total number of days of care for sick children. The results for this measure are very similar to those for *MALESHARE*. The magnitude of fathers' share of care for sick children is almost the same, and the difference between the before and after groups is small. There are no t-statistics for the difference for this measure, but the magnitude of the differences are very small, smaller than the insignificant differences for the variable *MALESHARE*.

Children born in different years are treated differently in some respects. For example do children who are born in December 1994 start school one year before children born in January 1995. This could potentially lead to a turn of the year effect on the use of parental leave and care for sick children. Table 9 shows the difference between before and after samples in fathers' use of parental leave and care for sick children. Care for sick children is measured by *MALESHARE* and by fathers share of total number of days for care for sick children (CSC).

Table 9: Differences Around the Turn of Years.

Cohort	Days of men's parental leave		MALESHARE		Men's share CSC percentage	
	2 weeks	3 months	2 weeks	3 months	2 weeks	3 months
1995-96	-1.07 (-0.80)	0.98** (2.00)	-2.08** (-2.46)	0.06 (0.20)	-0.92	-0.20
1996-97	0.45 (0.32)	0.13 (0.27)	0.04 (0.05)	0.15 (0.43)	-0.02	0.52
1997-98	0.59 (0.45)	-0.48 (-0.93)	1.83** (1.99)	0.15 (0.43)	1.77	0.15
1998-99	2.29* (1.67)	0.55 (1.06)	0.41 (0.42)	0.22 (0.61)	-0.87	0.44
1999-00	-3.02** (-2.12)	0.47 (-0.92)	-0.47 (-0.44)	-0.15 (-0.39)	-2.15	-0.34
2000-01	-0.49 (-0.36)	0.33 (0.65)	2.21** (1.98)	-0.28 (-0.66)	-0.22	-0.64

Note. Variables with *** are significant at the 1 percent level, with ** at the 5 percent level and with * at the 10 percent level.

There is no systematic difference between the before and after cohorts. For the three month cohorts we find no systematic pattern of significant effects for the turn of the year. The significant effects in the 2 weeks cohorts for some years are of different signs for different years, so there is not a consistent pattern of any turn of the year effects.

Finally, we turn to the relation between fathers' use of parental leave and their share of care for sick children. In Figure 6, we see that there is a strongly positive relation between fathers' parental leave and their share of care for sick children. This correlation is not causal, as an exogenous increase in fathers' parental leave did not affect their share of care for sick children. The design of the reform allows us to distinguish between the causal effects of parental leave to care for sick children from omitted variables for which

it would be hard to obtain good data, such as satisfaction at work, values held by fathers and mothers, and long-run costs of absences from work in the form of forgone promotions, for example.

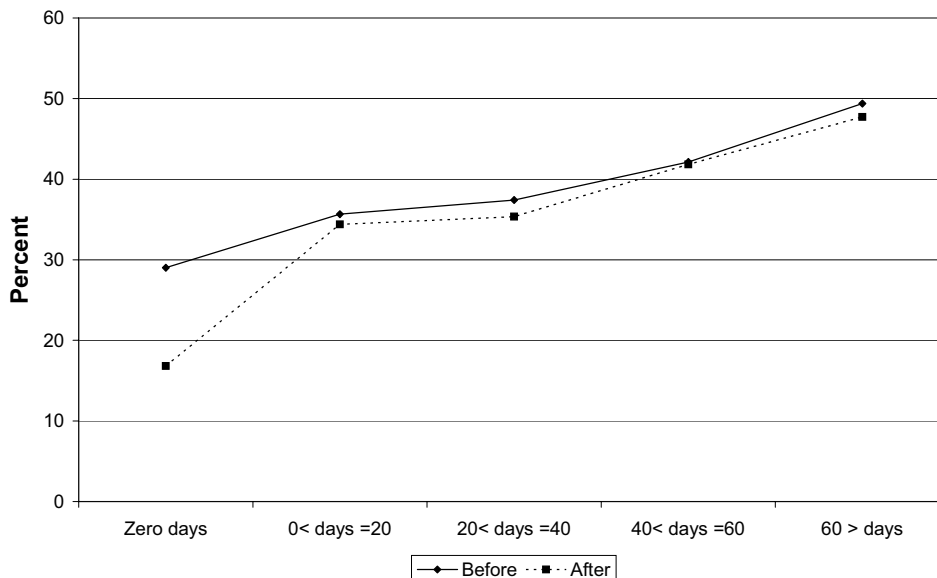


Figure 6. Fathers' Share of Care for Sick Children by Parental Leave Days.

Fathers' mean share of care for sick children essentially remains unchanged. The difference between the before and after group is explained by compositional effects. Note that the behavior of fathers taking more that 40 days of parental leave is not changed by the reform.

6 Conclusion

A daddy-month, which reserves one month of parental leave for the father, was introduced in Sweden in 1995. We compare the behavior of fathers of children born two weeks before and two weeks after the reform. The main effect of this reform on fathers' use of parental leave was that the share of fathers taking zero days decreased from 54 to 18 percent and that the number of fathers using around one month of parental leave increased from 9 to 47 percent. The fact that a large share of fathers took substantially more parental leave in the latter group did not affect their share of care for sick children, however.

The natural experiment approach used in this paper provides a very clean test of the immediate effects of the reform. The daddy-month reform might also have had effects that came into effect only gradually, if it for example

lead to a gradual change in values held by parents or in the expectations on mothers and fathers held by employers. We do not see any remarkable changes in trends in the use of parental leave or care for sick children during the years after the reform. Unfortunately, it is, at least with our data, impossible to disentangle possible gradual changes from the reform from other gradual changes, so we can not say anything about any gradual effects of the reform with certainty.

The reasons for the unequal labor market outcomes between men and women have received large attention from economists. We conclude by relating our findings to this literature. A number of mechanisms producing an unequal outcome have been offered. They do not necessarily conflict, in fact they might reinforce each other if several of them are present. An understanding of the relative importance of the mechanisms is yet important from a policy point of view, if policy makers aim at less inequality between men and women. The mechanisms also have different welfare implications.

Specialization according to productivity provides an explanation for the uneven outcome in the labor market, see Becker (1965, 1981). The specialization on housework of mothers due to care for newborns could have long-run effects if there is a learning-by-doing investment in human capital for labor market and household work. This specialization should be less pronounced when fathers take more parental leave. We find no support for the theory of specialization according to productivity in the data, however it is very strong from a theoretical point of view. Thus, we do not interpret the lack of confirmation of the theory as a refutation of the theory, but the absence of any visible effects casts some doubt on the theory as a prime explanation for the uneven division of housework and responsibility for children between genders.

Using Swedish data, two papers have found fathers to suffer a greater loss in wages from parental leave than mothers (Stafford and Sundström, 1996, Albrecht et al, 1999). This might be explained by fathers' use of parental leave being unexpected, and hence providing new information to the employer. The daddy-month meant that many more fathers used at least one month of parental leave and that the signal of taking one month becomes less negative. The lack of changes in fathers' share of care for sick children is compatible with signaling. Fathers with children born immediately before and after the reform will probably be evaluated in the same way if they are absent due to care for a sick child.

Differences in preferences between genders can cause specialization between genders in different types of work. Akerlof and Kranton (2000) analyze the role of identity - "a person's sense of self" as a source of differences in preferences. People engaging in activities that are not part of their identity

suffer a loss of utility. One of the cases discussed by Akerlof and Kranton is male and female identities in the workplace. The daddy-month reform meant that more fathers took one month of parental leave, which means that they take some responsibility for child care, but the mother does still take most of the responsibility. The daddy-month reform is unlikely to affect most fathers' identities, since most fathers already agreed that they should take at least some part of the responsibility for child care in a general sense. A reform reserving half or more of the parental leave for men would probably be a test of whether a change in the distribution of parental leave between fathers and mothers can affect male and female identities, and if such a large change would affect labor market outcomes, since it would probably conflict with the identities of a large share of the population. The daddy-month reform does not really test this theory, however.

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Appendix.

Table 10: Number of Observations in Samples Three Months before and after the Reform.

Sample	Before		After	
	Obs	Freq.	Obs	Freq.
Children	24528		27619	
Fathers	20814	84.9%	24978	90.4%
Mothers	24373	99.4%	27429	99.3%
Both parents	20659	84.2%	24788	89.7%

Table 11: Mean Number of Children for a 20- and 10-day
Period at the Turn of Years.

Sample	12-31/12		21-31/12		1-20/1		1-10/1	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
1993-94	259.8	36.6	249.8	33.2	298.1	31.4	288.4	34.6
1994-95	263.7	29.8	259.0	35.8	280.0	35.5	275.6	42.4
1995-96	226.3	24.5	218.6	23.6	255.9	23.6	258.1	25.6
1996-97	217.3	26.5	208.3	24.5	243.9	27.4	247.9	22.6
1997-98	206.4	19.9	211.2	19.7	233.4	27.8	227.4	31.0
1998-99	200.9	21.9	197.3	24.7	230.9	24.4	230.0	30.3
1999-00	199.0	27.7	193.8	23.1	227.2	23.9	221.0	31.4

Table 12: Distribution of Births by County, Before and after the Reform.

County	Before		After	
	Obs	Freq.	Obs	Freq.
Stockholm	848	22.9	826	21.2
Uppsala	136	3.7	144	3.7
Södermanland	127	3.4	108	2.8
Östergötland	149	4.0	202	5.2
Jönköping	125	3.4	151	3.9
Kronoberg	79	2.1	93	2.4
Kalmar	91	2.4	118	3.0
Gotland	21	0.6	22	0.6
Blekinge	57	1.5	58	1.5
Skåne	457	12.3	476	12.1
Halland	124	3.3	127	3.3
V:Götaland	607	16.9	579	17.5
Värmland	94	2.5	88	2.3
Örebro	110	3.0	110	2.8
Västmanland	125	3.4	118	3.0
Dalarna	100	2.7	112	2.9
Gävleborg	88	2.4	121	3.1
Västernorrland	93	2.5	81	2.1
Jämtland	46	1.2	50	1.3
Västerbotten	115	3.1	102	2.6
Norrbottn	97	2.6	110	2.8
Sum	3709	100.0	3892	100.0

Table 13: Mean of Parental Leave Days in Samples Three Months before and after the Reform.

	Before		After		Mean-Diff	T-stat
	Mean	Std	Mean	Std		
Sample: Three months before and after reform.						
Fathers:						
360-days	30.8	64.1	43.8	55.1	13.0	25.0
90-flat	8.3	21.5	8.7	21.1	0.5	2.6
Mothers:						
360-days	323.8	86.5	300.9	76.8	-22.9	-32.2
90-flat	59.2	42.9	63.6	40.5	4.4	12.1