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Parental Leave - A Policy Evaluation of the Swedish “Daddy-Month” Reform*

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Abstract

Many countries are trying to improve female labor market opportunities through family benefit policies. In 1995, Sweden introduced a reform designed to make fathers take more parental leave. It was believed that this would induce fathers to acquire more human capital for child care, and to make them take more responsibility for the family. We investigate a unique natural experiment: our data comprise all children born before (control group) and after the reform (treatment group), in cohorts of up to 27,000 newborns, mothers and fathers. We find strong short-term effects of incentives on male parental leave. However, we find no learning-by-doing (human capital) effects: fathers in the treatment group do *not* have larger shares in the leave taken for care of sick children, our measure for household work.

Keywords: Natural experiment, family benefits, gender and labor markets, incentives.

JEL codes: J48, J13, J16, J22

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1 Introduction

In many OECD countries, fertility rates and female labor market participation are low; female labor market outcomes are weak. A number of countries reconsider their family benefit systems; in particular, they extend parental leave.¹ In Denmark, Italy and Norway, this reform is accompanied by a restriction. At least one month of the extension is “use it or lose it” option for fathers. In Austria, three years of extended leave is offered, but only if the father takes at least six months of leave before the child turns three (Gatenio and Kamerman, 2002). Iceland has introduced the most radical reform. Here, three months are allocated to fathers, three to mothers. Only three months can be allocated freely between mothers and fathers. All of these policies aim at providing fathers with stronger incentives to take parental leave, and to share household work and the responsibility for child care, but it is very difficult to provide estimates on the effects of these policies.

We investigate a reform of the parental leave system in Sweden, arguably one of the countries with the most advanced and comprehensive family benefit system. The goal of the reform was to incentivize men to take more parental leave, to induce them to acquire more human capital for child care, and to make them take more responsibility for the family. The reformers hoped that this would then, through a number of channels (described below), help in dealing with unequal female labor market outcomes.

The reform design resulted in a clean natural experiment that we investigate here. Using register data for the entire population of children born in cohorts before (control group) and after the reform (treatment group), we observe cohorts of up to 27,000 newborns, their fathers and mothers over a span of eight years. We find that short-term incentives work: men take much more parental leave after the reform. However, we find no evidence for learning-by-doing (human capital) effects: fathers in the treatment group do *not* have larger shares in the leave taken for care of sick children, our measure for household work.

There is a large literature that tries to estimate the effect of family benefit systems and their reforms on labor market outcomes.² To the best of our knowledge, our paper is, however, the first attempt to measure the *direct effect* of changes in a family benefit system on the behavior within households. This has the advantage that we do not have to consider confounding labor market factors. Rather, we just look at the behavior of treatment v

¹For overviews of reform trends see: Gornick and Meyers (2004), *Bertelsmann Foundation* (2003), Ferrarini (2003). Ruhm (1998) and Ruhm and Teague (1997) provide comparisons of parental leave institutions.

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control groups of fathers in terms of participation in child care, our measure for household work.

To provide some background of the reform: Next to Norway, Sweden has been the first country that undertook reforms in order to give fathers stronger incentives to take parental leave. Swedish parental leave provides generous support. At the time of the reform one year of parental leave at a replacement rate of 80% was available. In contrast to many other countries, fathers and mothers were both eligible for parental leave, but, prior to the reform, women took the bulk of parental leave. On the first of January 1995, the government introduced the “Daddy-month” reform, reserving 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 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.

As the citation shows, Government was not only concerned about how more male parental leave would help to change gender roles and reduce the scope of discrimination. Rather, a number of economic forces were evoked. Prior to the reform, there was (statistical) discrimination against men who took parental leave (Albrecht et al, 1999, Stafford and Sundström, 1996). Government believed that this effect would be mitigated if more men were to take parental leave, because job disruptions owing to parental leave would

be less concentrated among women. Furthermore, there was a strong belief in society and in Government that a more equal allocation of parental leave would lead to less specialization of female human capital into household and child care work. This rationale is related to Becker's theories of human capital and the family (Becker, 1965, 1981, and 1985 and Rosen, 1983), and was reflected in the work of Swedish economists engaged in the public debate (Henrekson, 1993). The following quote from an interview with a father is representative for the human-capital related view on parental leave:

“If you have been there from the beginning, you also want to be there later on. I took the first step when they [the children] were little. It is like planting a flower, it gets more exciting when it grows up. You want to be there all the time.” From Nilsson (1994), translation by the authors.

The potential effects of the reform are as follows. First, fathers ought to increase their parental leave. Comparing treatment and control group, we indeed find that the reform increases male parental leave substantially. On average, male parental leave days increase by 15 days (around 50%), an increase that can be decomposed into two main effects: a) fathers take more parental leave when their child is between one and two years old (arguably a time in which links between fathers and children are important and much can be learnt about child care); b) for parental leave taken when the child is more than two years old, there is a very clear seasonal pattern with fathers taking more leave in the summer months and around Christmas (parental leave may hence simply be a substitute for regular paid holidays).

The second potential effect concerns the acquisition of human capital for household work. As pointed out by Becker, a parent who, today, specializes in household work (for instance, child care) will have a stronger future comparative advantage in household work. This leads to specialization of the two parents into household or “marketable” human capital. We test this specialization hypothesis by using a proxy of household work from data of a second benefit system, the sick leave for care for sick children. Comparing the treatment and control groups, we cannot find any support for the hypothesis that more male parental leave would translate in a higher share of male household work in the care for sick children. It appears that either the purported link between parental leave and human capital investment in household work does not exist, or that the specialization theory is not a major cause for the uneven distribution of household work between men and women, or that the effect of the reform was too weak to have significant effects. We discuss this issue further in Section 5.

There may be many other potential effects that only materialize gradually. Changes in norms about male and female behavior, or changes in the organization of the workplace to accommodate to more frequent parental leave by fathers do not occur instantaneously. These gradual changes may be very important, and the reform could have an impact on them, but we cannot measure them. Moreover, the reform would affect before and after cohorts in a similar way. We can hence not look at these effects.

In general, it is difficult to evaluate the effect of reforms in social benefit systems. However, our data are unique: they originate from the registry of the institutions paying the benefit, rather than being self-reported; we are also not studying a sample, but the entire population of children in a given period of time. Most importantly, the data stem 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.³ 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 leave, any potentially observed long-run behavioral changes of parents in the treatment cohorts should be a result of the reform.

The outline of the paper is as follows: The next section provides some background concerning the Swedish benefit systems for parental leave, the daddy-month reform and the care for sick children. Section 3 describes the data and our empirical strategy. The effects of the reform are analyzed in Section 4. Section 5 discusses the implications of our study for the design of parental leave systems. Section 6 concludes.

2 Background

In most OECD countries, there is a tendency to increase family benefits. The OECD (2001) provides a summary indicator that combines benefits such as the availability of child-care facilities, duration and replacement rates of maternity pay, and the possibility of voluntary leave from firms and flexibility of working hours. In this ranking, Sweden takes the top rank, followed by other Scandinavian countries and the Netherlands. It is also striking that the degree to which fathers participate in the system differs a lot across countries, and that Sweden takes the top rank here as well (Gatenio and Mamerman, 2002).

³We discuss further in Section 3.2 why we are confident that birth cannot be influenced much by parents.

While the bulk of benefits go to mothers, many countries now try to move away from traditional gender roles (Ferrarini, 2003). Hence, some family benefits are now designed in a way as to increase the responsibility of fathers for child care, and to improve the labor market opportunities of mothers. Sweden has been at the forefront of this tendency for at least three decades. As early as in 1974, the Swedish maternity-leave system was changed to a parental-leave system, in which the same rules apply to fathers and mothers. In the first year after the reform, men only used 0.5 percent of the total parental leave per household. By 1994, this figure had increased to 11.4 percent. The 1995 reform aimed at further increasing this percentage. Furthermore, from January 1, 2002 onwards, 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, but it shows that the Swedish government plans to continue the path taken with the 1995 reform that we study. There are strong groups in Swedish politics and society that are pushing for much more drastic changes, in order to provide stronger incentives for fathers (see the *Economist*, 2004).

2.1 Parental leave before and after the reform

For a maximum of 360 days per household, parents receive compensation with a reimbursement rate between 75 and 80 percent for the period studied. During the first two years after the reform, there was also a bonus of 10 percent for the first month of parental leave. Compensation is relative to prior gross earnings and takes into account potential wage increases in the parent's profession. There is a compensation ceiling that constitutes a binding constraint for 12 percent of fathers⁴ and 4 percent of mothers in sample at the time of the daddy-month reform.

There is an additional compensation system that provides a flat rate of 60 SEK/day (approximately USD 8) for 90 days. Parents without earnings (for instance, unemployed) receive compensation at this level for a total of up to 450 days of parental leave. 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.

Parental leave must be used before the child turns eight or finishes first grade in school, but more than 90 percent of the leave is used during the first two years of the child's life. Only one parent can use parental leave at

⁴We only observe fathers who receive some payment for parental leave, approx. 85% of all fathers. Hence, this figure may not be fully representative, if the fathers *not* using the benefit system are higher (or lower) income earners than those who do.

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.

The main effect of the reform is that for children born on or after January 1, 1995, one month is reserved for each of the parents. As almost all mothers use at least one month of parental leave before the reform, the restriction on the division of parental leave is only binding for fathers. Hence, the month reserved became known as the “daddy month”.

The only difference in compensation before and after the reform concerns a decrease in the reimbursement level from 90 to 80 percent. However, this change affected both control and treatment groups in the same way.⁵

2.2 Care for sick children

The second benefit system – which we will use to measure potential human capital specialization effects of increase in father’s parental leave – is leave granted for the care for sick children (CSC) up to the age of twelve. Reimbursement is based on current earnings and replacement rates vary between 75 and 80 percent for the period studied. Parents can benefit from this system up to 60 days a year. Again, the same replacement rules apply for control and treatment cohorts.

On average, during any given year, about 50% of the children in our parental leave data base show up in the statistics for care for sick children. That is, either father or mother or both have received leave for taking care of their sick children. This number is highest for two-year old children (65%), and it gradually declines for older children (RFV, 2002).

3 Data description and empirical strategy

We construct two types of cohorts of parents. The “before” and “after” reform cohorts (we will also use the terms “control” and “treatment”) are constructed from population data collected by the Swedish National Social Insurance Board (*Riksförsäkringsverket*). None of the data are self-reported. Rather the data are assembled from records obtained from local insurance offices, and cover all parental leave and the care for sick children taken between the years 1993-2003. We have information on geographical location, the starting date of 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

⁵Furthermore, from January 1, 2002 onwards, parents have been 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.

birth for both the child and the parent. To access information for a child or parent, at least one withdrawal of parental leave benefits must be observed between the quarter four of 1994 and quarter two of 2003, otherwise this information will be censored. Table 1 presents the number of observations in each cohort.

[Table 1 about here.]

3.1 Hypotheses

Government built its reform on two hypotheses. First, changing fathers' incentives would involve an increase in male parental leave; second, that this increase would induce behavioral, long-term changes.

In the pre-reform system, the parents had the choice of letting the mother, or the father, or none of the parents use parental leave. After the reform, the option is restricted to letting the father or none of the parents taking parental leave during the month reserved for the father. Prior to the reform, most of the parental leave was taken by mothers. The government expected that taking away the option for mothers to take all parental leave and reserving 30 days for exclusive use of fathers would incite fathers to increase their parental leave. Second, the government expected that if fathers took more parental leave, they should learn about child care, making them more prone to share responsibility for child care with mothers. The care for sick children leave (CSC system) provides a useful measure for the division of household work. In particular in less flexible jobs, the disruptions owing to leave for sick children may be quite important and employers may prefer male employees, because they expect them to take less leave for this purpose.

3.2 A natural experiment

By design, birth is a random event. The timing of conception cannot be completely controlled by the parents. The exact birth date of a child, given the date of conception, is the outcome of a random process. The duration of pregnancy is normally distributed with a mean of 40 weeks and a standard deviation of two weeks. While the birth of a child cannot be postponed, it can in principle be triggered. However, we are not very concerned about this possibility. In discussions with Swedish doctors and midwives, we were told that triggering birth (except for health reasons) is considered highly unethical and against professional standards. We have also compared the number of births around the turn of the reform year 1995 with all other years between

1993 and 2003, the period for which we have data. Nothing seems to indicate that 1994/95 differs from any other year.

We compare the behavior of parents in the control and treatment cohorts by simply looking at the distributions of parental leave and care for sick children of the respective cohorts. We are using two types of cohorts: first, before and after cohorts in a span of two weeks around the first of January 1995; second before and after cohorts of a span of three months. The first type of cohorts has the advantage to contain few if any seasonal effects, but when looking at subgroups, for instance income or age, the sample is rather small. The second type of cohorts deals with this problem, at the expense of filtering in more seasonal effects, changes in norms or macro-economic conditions etc.

[Table 2 about here.]

In order to re-enforce our point that we are looking at a truly natural experiment, Table 2 presents descriptive statistics for the age of fathers and mothers. The table shows that there are only small differences in the age distribution between the samples, and a *t-test* assesses that there is no statistically significant difference in the mean age between the before and after reform parents. Notice 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 control and treatment cohorts in any of these variables would hence show in a difference in age. This argument may not hold for fathers, as there are 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 also looked at the geographical distribution of births and find no systematic differences between the cohorts in this respect either. It hence seems very unlikely that there is a systematic difference in the characteristics of parents in the control and treatment cohorts.

We hence here have what Rosenzweig and Wolpin (2000) have called a 'natural' natural experiment. The most important advantage of such a natural experiment is to avoid problems with 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, fathers who work for management with traditional views, or fathers with jobs where absence causes substantial problems, will all be less likely to take both parental leave and leave for the care of sick children. It would then

be impossible to determine the causal effect of parental leave on care for sick children, unless all these effects can be controlled for. But in our experiment there are no omitted variables, as we have an exogenous change in fathers' parental leave that is owing to the daddy-month reform.

4 Effects of the reform

In this section we investigate the effects of the reform on fathers' use of parental leave and on fathers' share of care for sick children.

4.1 Parental leave

In Table 3 we present a comparison of the means of parental leave days for the two cohorts. We report the data for two systems: the 360-day system in which people receive a compensation of 80% of earnings and the additional 90-days system that provides a low flat rate. Fathers increase their parental leave in the 360-day system by about 15 days. It makes sense that this increase is below the 30 days reserved for fathers by the daddy-month reform as some fathers would have used more than that even in the absence of the reform and others use less than the 30 days earmarked for them. For the same reasons it is also intuitive that the decrease of mothers' parental leave outweighs the increase of fathers' parental leave. The *t-ratio* shows that there is a statistically significant difference in the means of parental leave days between the treatment and control cohort. Notice also that the results for the 360-days system are not sensitive to the cohort size chosen.

[Table 3 about here.]

It is interesting to note that there is an increase in mothers' use of the 90-day system. We interpret this as a substitution effect: some mothers use this (less generous) system when their access to the more generous 360-day system is reduced. The increase of fathers' use of the 90-day system is harder to explain. However, the effect vanishes, if we look at the three months cohort. The total number of parental leave per child decreased, on average, by five days.

Finally, as a robustness check, we have experimented with many other cohort sizes between ten days and three months, none of which has generated different results.

[Table 4 about here.]

From Table 4, it is clear that the mass point for the male parental leave distribution shifts from zero days before the reform towards 30 days after the reform. The fraction at zero days decreases by 36 percentage points, from 53.7 to 17.7 and the fraction in the interval between 20 and 40 days increases by 38 percentage points. Notice that the reform has no effect on the distribution of 60 days or more. This, makes much sense as these fathers should be unaffected by the reform.

[Figure 1 about here.]

Figure 1 plots the mean percentage of fathers who are on parental leave, for each month during the eight-year period that we look at. The dotted line represents the control group and the solid line the treatment group. The figure reveals four differences between treatment and control group. First, there is some increase of male parental leave days in the first year, in particular during the summer months (holidays) and December (Christmas holidays). Second, there is a massive increase of days taken by fathers during the second year. A third effect concerns the more pronounced seasonal peaks, again around the summer and the winter, from year 3 to 7. Finally, there is a massive increase of days at the eighth year, owing to the fact that parental leave has to be used before the child turns eight (actually, the government informed parents about their outstanding entitlements for parental leave).

Taken together, these changes translate into two effects: fathers tend to take more time in the summer season and around Christmas, and fathers tend to take more time with children in the second year of their life. The seasonal pattern is reinforced in the treatment group. Compared to the control group, the amount of days taken in the summer months and in December increases by up to 100%, while in other months, the increase is between 30% and 50%. We have also looked at weekday effects, but have not found much interesting going on.

4.2 Care for sick children

We here look at the second hypothesis: If more male parental leave induces some human capital acquisition for child care by male, the treatment cohort should feature a higher male share of care for sick children. Notice first that the decision of parents how to share the care for sick children is not a zero/one decision. Most children, 88 percent, are sick on at least one occasions during the period studied. Whether the father or the mother should stay at home with a sick child on a certain occasion depends on potential problems caused at the workplace, which varies from day to day. The (dis-)satisfaction from

working could also vary between days. From the data, we know that most fathers have a positive share in the care for sick children: 23% of sick children were only taken care of by the mother, 7% only by the father, while 70% of mothers and fathers shared the responsibility for sick children.

We use two measures for fathers' share of care for sick children (CSC). In Table 5, *MALESHARE* (A) is defined as the average of the male share of care for sick children within the household; "Men's share of total number of days" (B) is simply total male days taken for care for sick children in the sample divided by total days (male and female).⁶ The two measures produce very similar results. For the first measure there is no statistically significant difference in the means between the before and after reform cohorts. For the second measure there is a small negative effect of the reform on fathers' use of parental leave for the two week cohorts, but this effect vanishes for the three-months cohort. There are no *t-statistics* for the differences between the before and after group of this measure. Note however that these differences are very small, smaller than the insignificant differences for the variable *MALESHARE*.

[Table 5 about here.]

As noted above, there is a trade-off when deciding on the size of cohorts. A small sample results in a very clean natural experiment, but there are potential problems with small samples. A large sample avoids these, but makes the natural experiment less clean. For the two-week sample, for instance, there is only a 28-day difference in age between the first child in the control group and the last child in the treatment 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.

A second comment concerns the fact that children born in different years are treated differently in some respects. For example, 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 in both the use of parental leave and care for sick children. To investigate turn of the year effects, we construct cohorts around the turn of the year for the six years following the reform. Table 6 shows the difference in male use of parental leave and care for sick children for each turn of the year, for both the reform

⁶The difference between the two measures is that they weight the number of CSC days differently. For instance consider two families; the first family where the child is sick for two days, where both the father and the mother take one day of for care is treated by the first measure as being the same as the second family where the child is sick for 100 days, and the mother and the father both take 50 days of. The family with the child that is sick 100 days is weighted 50 times as heavy by the second measure.

year and the six following years. For the years after the reform, there seems to be no systematic difference between cohorts of children born before and after the turn of the year. Notice also that only few of the changes around the turn of the year are significant, and that most of them disappear when one looks at the three months cohort, for both parental leave and care for sick children.

[Table 6 about here.]

We finally turn to the relation between fathers' use of parental leave and their share of care for sick children. The data in Table 7 show that there is a strong positive correlation between fathers' parental leave and their share of care for sick children. However, it is important to see that this correlation is *not* causal. Notice first that in the control group the correlation between parental leave days and the male share of sick children is much weaker than in the treatment group. This seems to be the result of a composition effect in the groups of fathers who take at least one day of parental leave. The proportion of fathers taking no parental leave in the control group is three times as large as the one in the treatment group. Most of the fathers in the treatment group take 20 to 40 days (46.7% of the treatment group) rather than zero days, and some take one to 20 days. It hence appears that there are unobserved factors that make fathers share responsibility for care for sick children: work satisfaction, values held by fathers and mothers, long-run costs of absence from work, norms in society etc. None of them seem to be immediately affected by the exogenous increase of parental leave that is the result of the reform. The reform may have lead to a gradual change in norms in society, but with our data it is impossible to disentangle such an effect from other changes.

[Table 7 about here.]

The design of the reform allows us to distinguish between the causal effects of parental leave on care for sick children from omitted variables. Fathers' mean share of care for sick children essentially remains unchanged. The difference between the before and after group is explained by compositional effects. This impression is further reinforced by the fact that the behavior of fathers taking more that 40 days of parental leave is not changed in a significant way by the reform (note the standard deviations in parentheses).

4.3 Further observations

Many Swedish mass media believe that fathers take parental leave in particular when there are major sports events like the Olympic Games. We do not find much evidence for this, although we have experimented with different types of regression analyses. For the Winter Olympics of 1998, for instance, we find that about 0.39 percent of fathers are on parental leave compared to about 0.37 percent in the weeks before the event. For other major sports events we find effects of similar or smaller size. Statistically it is hard to disentangle the effects of sports events from seasonal variations, but it is safe to say that the economic magnitude of any possibly effects of sports events on parental leave is negligible, if these effects exist at all.

[Table 8 about here.]

A second set of observations relates to the effect of fathers and mothers income on parental leave. Table 8 compares treatment and control groups. We infer women's income from their mean reimbursement in the 360-days system. Around 20% of women had an income of nil or too low to receive reimbursement above the minimum amount of SEK 60 (USD 8). Hence, the two lowest deciles are pooled for women. For men, there is a potential selection problem that does not allow us to infer their income from the 360-days system.⁷ We measure income by the reimbursement in the 10-day system that is paid in connection with birth. We find that fathers' parental leave is increasing in income up to the reimbursement ceiling. This is in line with earlier research, see Sundström and Duvander (2004). The increase in fathers parental leave are about the same for all income groups. However, while we expected to see the strongest effects of the reform for subgroups in which women have a higher income than men, we did not find any sign of this in the data. Rather, there seems to be a U-shaped pattern between the income of mothers and parental leave by fathers.

Fathers parental leave is also relatively high when mothers are in the two highest income deciles. This is in line with the results in Sundström and Duvander (2004). We have also related the changes in care for sick children to income levels of the parents in the before and after groups. We find no systematic pattern for the changes between income subgroups. This is what

⁷Fathers in the treatment group use the 360-day system to a much larger extent. The ten days that are reimbursed in connection with the birth of a child are used by about 66 percent of the fathers, both in the treatment and in the control group. The fathers who do not take any time off in connection with the child's birth are in the 1-4 cohort, so this cohort mainly consist of unobserved rather than low income.

we expected, as there is no significant difference in the mean values of care for sick children for the whole before and after group.

A last interesting observation relates to mothers in the lowest two income deciles. Here, fathers take a comparatively large number of days, and there is no increase in the treatment group. This is what to expect from rational households. The opportunity cost for taking parental leave for these fathers was very low. Mothers only lose the low flat-rate reimbursement SEK 60 (USD 8) per day when fathers take a day of parental leave. Thus, these fathers basically face no economic restriction on the amount of parental leave they could take, neither before nor after the reform. Hence, the amount of days they take can be seen as the unconstrained maximum of parental leave by fathers. However, fathers who are matched with higher-income mothers face a different maximization problem, and one cannot generalize the findings for these unconstrained fathers on the entire population.

5 Discussion and implications

The main motivation for the “daddy-month reform” was to increase the opportunities of women in the labor market and to induce more equal labor market outcomes. Based on Becker’s work (1965, 1981, 1985), there was a belief in society that more parental leave by fathers could help decrease the specialization of mothers in human capital for household work and child care. This would, in turn, increase the household and child care human capital of fathers. The reform succeeded in inducing many fathers to take more parental leave, but it did not affect the intra-household allocation of care for sick children.

To draw conclusions from this experiment, one has to ask why there were no effects on care for sick children at all. Clearly, the reform design has its weaknesses. In particular, fathers could allocate their parental leave over eight years. One should expect that an effect on human capital and long-term behavior would be more likely, if parental leave would have to be taken in a shorter period of time and when the child is very young. Probably more important is the fact that the reform may not have provided a strong enough stimulus – an average increase of fathers’ parental leave by less than a month may not be sufficient to affect human capital acquisition.

It is hence an open question whether reforms that provide stronger incentives to fathers to take parental leave could induce long-term behavioral changes. In any case, our study shows how well incentives work in the short-term, but also how difficult it is to induce behavioral changes and household decision-making. Notice that we even find very little long-run effects in the

subgroups for which the effects of the reform should be most pronounced (see 4.3).

It is important to notice that there are other economic forces than human capital acquisition that may be responsible for unequal labor market outcomes. For instance, given gender roles and norms in society, employers may interpret parental leave by fathers as a bad signal about their job commitment. Two papers have indeed found that fathers suffer greater wage losses when they take parental leave than mothers (Stafford and Sundström, 1996, Albrecht et al, 1999). This is in line with parental leave being interpreted as a signal of lacking job commitment. The daddy month has induced many fathers to use at least one month. Hence, there should be less of a stigma associated with taking parental leave. However, the reform did not affect the care for sick children benefit. A theory built on signalling could hence explain to some extent the asymmetric effects concerning the two benefit systems. There are other important factors, for instance, “identity” (Akerlof and Kranton, 2000) which may explain different *preferences* behavior across gender.

What type of reform could teach us more about the degree to which social policies can influence household decisions concerning child care? First of all, it appears useful to identify carefully the theoretical basis for any of these reforms and to generate empirical predictions. Second, one may have to experiment with more intensive reforms. Reserving half of the parental leave for men would indeed be such a test. However, on the background of our study, it should be clear that there are trade-offs associated with such a drastic reform. While the daddy month induced more parental leave by fathers, it should not be forgotten that this reduced the total parental leave per child by five days. A more intensive reform may consequently have such effects on a larger scale.

In this respect it is also important to notice that at least in Sweden, the gender wage gap is very low for lower skill groups and is most significant for the higher skill groups (Albrecht et al, 2003). Hence, a more drastic reform has uncertain effects in terms of the labor market opportunities, but may result in welfare losses for some groups. To reduce these potential welfare losses, we hence believe that if such an experiment were taken, it should not be designed for the entire economy, but rather for subgroups, segmented for example regionally. However, to introduce such a reform for only part of the population may be difficult to implement.

6 Concluding remarks

We have investigated the effects of the daddy-month reform, introduced in Sweden in 1995. Different treatment of parents whose children were born before and after the reform provides a natural experiment. The share of fathers taking zero days of parental leave in the treatment group decreased from 54 to 18 percent, and the number of fathers using around one month of parental leave increased from 9 to 47 percent.

The reform reached its short-term goal of increasing fathers' parental leave remarkably well, but we have not found any sign that more parental leave has changed the behavior of fathers in terms of taking care for sick children.

It hence appears to be rather easy for a government to incentivize fathers to take parental leave. However, it appears much harder to induce behavioral changes, through the acquisition of human capital for household work and child care.

References

- Albrecht, James W., Per-Anders Edin, Marianne Sundström and Susan B. Vroman (1999), "Career Interruptions and Subsequent Earnings: A Reexamination Using Swedish Data", *Journal of Human Resources*, Vol 34: 294-311.
- Albrecht, James W., Anders Björklund and Susan Vroman (2003), "Is There a Glass Ceiling in Sweden?", *Journal of Labor Economics*, Vol 21: 145-177.
- Becker, Gary S. (1965), "A Theory on the Allocation of Time", *Economic Journal*, Vol 77: 493-517.
- Becker, Gary S. (1981), *A Treatise on the Family*, Harvard University Press.
- Becker, Gary S. (1985), "Human Capital, Effort, and the Sexual Division of Labor" *Journal of Labor Economics*, Vol 3: 33-58
- Bertelsmann Foundation (2004), various issues of <http://www.reformmonitor.org/>
- The Economist (2004), "Forced Fatherhood", January 8th, Print Edition.
- Ferrarini, Tommy (2003), *Parental Leave Institutions in Eighteen Post-war Welfare States*, Doctoral Dissertation, Department of Sociology, Stockholm University.
- Gatenio, Shirley and Sheila Kamerman (2002), *The Clearinghouse on International Developments in Child, Youth & Family Policies*, Spring issue, <http://www.childpolicyintl.org/issuebrief/issuebrief5.htm#takeup>
- Gornick, Janet C. and Marcia K. Meyers (2003) *Families That Work: Policies for Reconciling Parenthood and Employment*, New York: Russell Sage Foundation.
- Government Proposition 1993/94:147 to the Swedish Parliament.
- Henrekson, Magnus, (1993), "Jämställdhet ur Incitamentsperspektiv (Gender Equality: An Incentive-Based Analysis)", *Ekonomisk Debatt*, Vol 20.
- Nilsson, Agneta (1994), *Föräldraledighet (Parental Leave)* 4th ed, Folkhälsoinstitutet (Swedish National Institute of Public Health), Stockholm.
- RFV (National Social Insurance Board) (2002), *Social Insurance in Figures*, Stockholm.

- Rosen, Sherwin, (1983), "Specialization and Human Capital", *Journal of Labor Economics*, Vol 1: 43-49
- Rosenzweig, Mark R. and Kenneth I. Wolpin (2000), " 'Natural' Natural Experiments in Economics", *Journal of Economic Literature*, Vol 38: 827-874.
- Ruhm, Christopher J. (1998), "The Economic Consequences of Parental Leave Mandates: Lessons from Europe", *Quarterly Journal of Economics*, Vol 113: 287-317.
- Ruhm, Christopher J. and Jacqueline L. Teague (1997), "Parental Leave Policies in Europe and North America", in Francine D. Blau and Ronald G. Ehrenberg (eds.) *Gender and Family Issues in the Workplace*, New York: Russell Sage Foundation.
- Stafford, Frank P. and Marianne Sundström (1996), "Time Out for Child-care: Signalling and Earnings Rebound Effects for Men and Women", *Labour*, 10: 609-629.
- Sundström, Marianne and Ann-Zofie E. Duvander (2002), Gender Division of Childcare and the Sharing of Parental Leave among New Parents in Sweden, *European Sociological Review*, Vol 18: 433-447.

Table 1: Number of observations in different cohorts.

Cohort	Two weeks*		Three months**	
	Before	After	Before	After
Children	3709	3892	24528	27619
Fathers	3134	3467	20814	24978
Mothers	3676	3866	24373	27429
Both parents	3101	3441	20659	24788

* Two week cohorts: the before group consists of children born between 18 to 31 December 1994.

The after group consists of children born between 1 to 14 January 1995.

** Three-months cohorts: The before group consists of children born between 1 October to 31 December 1994. The after group consists of children born between 1 January to 31 Mars 1995.

Table 2: Average age of mothers and fathers for different cohorts.

Cohort	Two weeks		Three months	
	Before	After	Before	After
Fathers	31.98 (6.03)	31.90 (5.95)	32.05 (5.96)	31.95 (5.82)
Mothers	29.15 (5.04)	29.06 (5.14)	29.23 (5.14)	29.16 (4.99)

Note: Standard deviations in parentheses.

Table 3: Mean of parental leave days.

Cohort	Two weeks				Three months			
	Before	After	Diff	T-stat	Before	After	Diff	T-stat
Fathers:								
360-days*	29.5 (61.9)	44.2 (57.4)	14.7	10.8	30.8 (64.1)	43.8 (55.1)	13.0	25.0
90-days**	8.0 (21.1)	9.3 (21.8)	1.4	2.8	8.3 (21.5)	8.7 (21.1)	0.5	2.6
Mothers:								
360-days*	323.7 (87.3)	298.9 (80.5)	-24.7	-12.8	323.8 (86.5)	300.9 (76.8)	-22.9	-32.2
90-days**	59.9 (42.8)	63.1 (44.0)	3.2	3.2	59.2 (42.9)	63.6 (40.5)	4.4	12.1

Notes: Standard deviations in parentheses.

* 360-days represents the parental leave system in which parents are compensated for a maximum of 360 days, with a replacement rate of 80% of their estimated earnings.

** 90-days represents the parental leave system in which parents are compensated for 90 days at flat rate of 60 SEK/day (appx. 8 USD).

Table 4: Distribution of fathers' parental leave (360-days system) in percentages, for different cohorts.

Number of days	Two weeks			Three months		
	Before	After	Diff	Before	After	Diff
0 days	53.7	17.7	-36.0	53.2	16.0	-37.2
0 - 10	10.7	4.4	-6.3	10.4	3.7	-6.7
10 - 20	5.6	5.5	-0.1	5.8	5.4	-0.4
20 - 30	5.5	34.3	28.7	5.5	37.2	31.7
30 - 40	3.7	12.4	8.6	3.8	12.3	8.5
40 - 50	2.8	4.7	2.0	2.7	4.7	2
50 - 60	2.1	2.9	0.8	2.2	3.3	1.1
60 - 70	2.1	2.4	0.4	2.1	2.6	0.5
70 - 80	1.5	1.8	0.2	1.6	1.9	0.3
80 - 90	1.5	1.8	0.3	1.6	1.6	0
90 - 100	1.1	1.2	0.1	1.2	1.4	0.2
100>	9.6	10.9	1.3	9.9	10.0	0.1

Table 5: Fathers' share of care for sick children (CSC).

Cohort	Two weeks			Three months		
	Before	After	Diff	Before	After	Diff
(A) <i>MALESHARE</i> *	35.04	35.52	0.47 (0.79)	34.93	35.44	0.51 (0.30)
(B) Men's share of total number of days**	34.60	34.15	-0.45	34.58	34.60	0.02
<i>N. of obs.</i>	3226	3427		21561	24500	

**MALESHARE* is defined as follows: Compute the male share of days spent for care for sick children by each child in the data set. *MALESHARE* is the average male share taken over all children (that is, across households).

**Men's share of total number of days is: total male days divided by total days (male and female).

Note: Standard deviations in parentheses.

Table 6: Differences around the turn of years.

Cohort	Days of men's parental leave		<i>MALESHARE</i>		Men's share CSC percent	
	Two weeks	Three months	Two weeks	Three months	Two weeks	Three months
1994-95	14.7*** (1.37)	13.0*** (0.52)	0.47 (0.79)	0.51 (0.30)	-0.45	0.02
1995-96	-1.07 (-0.80)	0.98** (2.00)	-2.08** (0.85)	0.06 (0.30)	-0.92	-0.20
1996-97	0.45 (0.32)	0.13 (0.27)	0.04 (0.80)	0.15 (0.35)	-0.02	0.52
1997-98	0.59 (0.45)	-0.48 (-0.93)	1.83** (0.92)	0.15 (0.35)	1.77	0.15
1998-99	2.29* (1.67)	0.55 (1.06)	0.41 (0.98)	0.22 (0.36)	-0.87	0.44
1999-00	-3.02** (-2.12)	0.47 (-0.92)	-0.47 (1.07)	-0.15 (0.39)	-2.15	-0.34
2000-01	-0.49 (-0.36)	0.33 (0.65)	2.21** (1.12)	-0.28 (0.52)	-0.22	-0.64

Notes: Differences stated with * are significant at the 10 percent level, with ** at the 5 percent level and with *** at the 1 percent level. Standard errors in parentheses.

Table 7: Fathers' share of care for sick children measured by *MALESHARE* grouped by parental leave days (PL-days).

Cohort Number of PL-days	Two weeks			
	Before		After	
	CSC	Freq.	CSC	Freq.
PL-days=0	29.0 (0.8)	53.7	16.8 (1.4)	17.7
0<PL-days≤20	35.6 (1.3)	16.3	34.4 (1.7)	9.9
20<PL-days≤40	37.4 (1.7)	9.2	35.4 (0.8)	46.7
40<PL-days≤60	42.1 (2.4)	4.9	41.8 (1.9)	7.6
PL-days>60	49.4 (1.4)	15.8	47.7 (1.2)	18.1

Note: Standard deviation in parentheses.

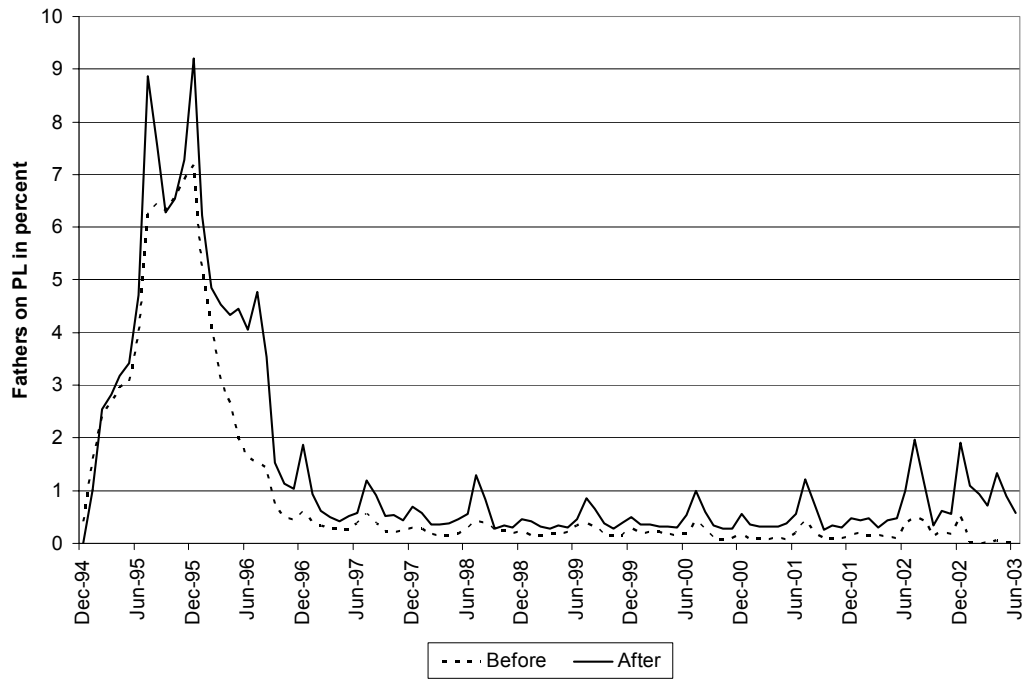


Figure 1. Mean percentage of fathers on parental leave, in a given month.