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Fathers' childcare and parental leave policies: Evidence from Western European Countries and Canada

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Fathers' Childcare and Parental Leave Policies - Evidence from Western European Countries and Canada

Nora Reich*, Christina Boll† and Julian Leppin‡

February 2012

Abstract

The study at hand pursues the following question: How are national parental leave arrangements related to fathers' participation in and time used for childcare? To answer this question, we merge data from the Multinational Time Use Study (MTUS) with national parental leave characteristics. Specifically, we are using 30 surveys from eight industrialised countries from 1971 to 2005. Applying a selection model, we are estimating fathers' participation in childcare and the minutes per day spent on childcare. We control for the following parental leave characteristics: duration of leave, amount of benefits and the number of weeks reserved for the father. The main results are that duration of parental leave, exclusive weeks for the father and any benefit compared to no benefit have a positive impact on fathers' childcare participation. Parental leave weeks reserved for the father and parental leave benefits affect fathers' minutes of childcare positively. It is concluded that parental leave characteristics have effects on fathers' childcare participation and time spent on childcare, but that parental leave policies have to be evaluated within the framework of each country's family policy package.

JEL Classification: D13, J13, J18

Keywords: childcare, fatherhood, parental leave, time use

1 Introduction

During the last decades, economists and other scientists have identified numerous advantages of fathers' engagement in childcare on the individual, the family and the macroeconomic level. Among these are children's well-being (Carlson and McLanahan 2004; Palkovitz 2002), fathers gain of social competences and work-life-balance (see overview in Hook 2006), higher fertility (Buber 2002; Cooke 2003; Duvander and Andersson 2006; Lappegård 2008; Olah 2003; ?), as well as higher marital stability and satisfaction (Greenstein 1995; McHale and Crouter 1992; Olah 2001; Sanchez and Gager 2000; Wengler et al. 2008; Sigle-Rushton 2010).

The European Union has recognised the advantages of parents sharing childcare tasks (and financial responsibilities), as it demands a minimum of three months of parental leave for both parents and states that *“men should be encouraged to assume an equal share of family responsibilities, for example they should*

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be encouraged to take parental leave" (UNICE et al. 1996) in the 1996 framework agreement on parental leave. Meanwhile, all European and most other industrialised countries have established parental leave for both parents. Yet, parental leave policies and other laws affecting women's and men's allocation of time vary considerably between countries, providing different incentives and disincentives for men and women to share childcare tasks (Sullivan et al. 2009). At the same time, a great cross-national variation in the time fathers spend with children is observed (Stancanelli 2003). As the birth of the first child often leads to the traditional division of paid and unpaid work between the partners (Schulz and Blossfeld 2006), the question arises whether parental leave policies can affect the degree of this (re-)traditionalisation through a long term impact on fathers' engagement in childcare.

During the last years, researchers have increasingly investigated the role of family policy for fathers' childcare time. Bygren et al. (2011) showed that an index consisting of fiscal and cash child benefits supporting the traditional male breadwinner model has a negative impact on fathers' childcare time. Conversely, their index based on earner-carer policies has a positive impact on fathers' childcare time. Smith (2001) and Smith and Williams (2007) showed that the score in a father-friendly policy index is positively correlated with fathers' childcare. Regarding parental leave characteristics, age compensation and leave that can be taken in fragments was positively correlated with fathers caring 28 hours or more per week (Smith 2001). In Hook's (2006) analysis, weeks of parental leave had a negative and parental leave available for men had a positive impact on the number of minutes per day fathers spend in unpaid work. However, the author did not distinguish between household chores and childcare. In addition, she did not test for parental leave benefit and exclusive weeks for the father. For Sweden, Eckberg et al. (2005) find that fathers who used parental leave did not have larger shares in the leave taken for sick children, concluding that fathers' taking parental leave does not have long-term behavioural effects. In contrast, for the same country, a recent study by Duvander and Jans (2009) finds a positive association between fathers' parental leave use and continued father-child contact.

To sum up, the existing empirical literature offers insight into the role of family policy as predictor of fathers' time used for childcare. Nonetheless, several questions remain unanswered. Firstly, no study has tested the impact of distinct categories of parental leave benefits and of exclusive parental leave weeks for fathers on fathers' time for childcare. Secondly, they neglect that a considerable number of fathers do not participate in childcare at all on the survey day, and that some of them can legitimately be labelled true "non-participants".¹ Especially against the background of rising public childcare use, it is valuable to disentangle *participation* in childcare from the *amount of time participating fathers* spend with childcare.

The article at hand aims at filling some of the knowledge gaps on the relation between parental leave policies and fathers' childcare participation and childcare time. We link time use data from the Multinational Time Use Survey (MTUS) to national parental leave characteristics and use a selection model to estimate the impact of duration of parental leave, parental leave benefit categories, and exclusive parental leave weeks for the father on fathers' participation in childcare and participating fathers' childcare time. Participation is defined as zero versus more than zero minutes of childcare, while childcare time refers to the number of minutes of childcare on the survey day. We consider the following eight Western countries: Canada, Finland, Germany, Italy, the Netherlands, Norway, Sweden and the United Kingdom.

The article is structured as follows. In sections 2 and 3, theoretical approaches regarding fathers' involvement in childcare are discussed and the theoretical link between fathers' childcare and parental leave policies is developed. Next, in sections 4 and 5, the data and sample as well as the model and

¹Cf. Pacholok and Gauthier (2010) and Reich (2012) on the discussion about fathers' participation in childcare versus their childcare time.

variables are presented. Section 6 presents descriptive findings, and section 7 provides the results of the regression models on fathers' childcare participation and childcare time. Section 8 concludes.

2 Theories on the allocation of time

Both economists and sociologists have developed theories trying to explain a partnered individual's allocation of time for paid and unpaid work (including childcare). According to Becker's (1965, 1981) New Home Economics, a couple maximises its utility if the spouse who is better educated and can therefore achieve a higher market income specialises in market work while the other spouse specialises in unpaid work, i.e. household chores and childcare. This assumption is gender-neutral as human capital is the only determinant for the division of labour. However, Becker (1981:21) claims that due to the "biological commitment" of women for child "production" and care, women are more productive in the household, even if both spouses are endowed with the same human capital. This comparative advantage implies lower opportunity costs of refraining from paid work for women than for men, which, in turn, leads to the traditional gender division between paid and unpaid work. In addition, early specialisation of women into household and childcare tasks as well as limited career advancements and lower wages in typical women's jobs further contribute to the gender-specific distribution of market and non-market work. Moreover, according to Becker's (1985) theory of optimal energy allocation, the parent who is mainly responsible for energy-intensive housework and childcare tasks has less energy to use in market work. This results in low productivity in the market and further reduces the income. Applying this approach to fathers' time for childcare, it predicts that a father takes part in childcare if and only if his spouse is better educated and achieves the higher income.

As this model, among other points of criticism, fails to explain why many mothers who are less educated than their male partners try to keep their foot in the door regarding labour market participation, i.e. work part-time, a second economic theory has been widely used to explain couples' division of paid and unpaid work. The Bargaining theory (e.g. Ott 1992) assumes an individual utility function for each spouse. According to dynamic bargaining models, individuals foresee that their decision on time used for paid and unpaid labour in period 1 affects their outside marriage options and thus bargaining position in period 2. Hence both spouses are eager to spend some time in paid labour. However, as the current endowment of human capital determines the bargaining position, the partner with higher market resources will spend more time in paid labour while the other one has to do the lion's share of household and childcare tasks. Following this theory, a father would spend more time in childcare the lower his educational level and commensurate income opportunities are in relation to those of his spouse.

Both the unitary and the bargaining model imply that the necessity of parental care diminishes as the child becomes older, because children may then stay alone for a longer time span and market substitutes to parental care become less costly and more easily available. Consequently, mothers and fathers engage less in childcare the older the child is.

A different motivation for explaining the degree of specialisation within the household is provided by the sociological theory of gender ideology. It claims that gender ideologies determine preferences which, in turn, generate the degree of specialisation within a household (Blair and Lichter 1991). Generally, gender ideologies seem to not only vary between societies but also between social classes. Blossfeld and Drobnic (2001) point out that the motivation for mothers' labour market participation differs between social classes, therefore implying different views about proper motherhood and fatherhood. The importance

of active fatherhood and the sharing of breadwinning and caregiving is generally more prevalent among highly educated fathers (Ishii-Kuntz and Coltrane 1992). However, following this approach, predictions for the fathers' time for childcare are not straightforward. On the one hand, a father's time for childcare is likely to increase with his level of education and, hence, income. On the other hand, the higher his relative income, the lower the incentives for his female partner to work in the labour market and the larger the incentives for her to focus on household and childcare tasks.

A somewhat different but important contribution is the Doing Gender theory (West and Zimmermann 1987; Brines 1994). It suggests that women and men have to display that they act according to prevailing gender roles. If, in a traditional society, a father earns less than his wife, it implies that he cannot display being a proper husband resulting in a loss of identity that is compensated by retaining or even exaggerating traditional behaviour in terms of unpaid work. This idea has been incorporated in an economic model by Akerlof and Kranton (2000) who enhanced the bargaining model through the variable "identity". The outcome of this strand of theories is rather the opposite of the predictions of the bargaining and New Home Economics models: Men who are less successful in the labour market do less housework and childcare.

At this point it has to be mentioned that all of the existing approaches fail to draw distinctions between housework and childcare although empirical evidence shows that the costs and rewards of these activities and hence their relationship to education and income differ substantially from one another.

3 Parental leave policies and the allocation of time

Between 1970 and 2000, almost all industrialised countries introduced some sort of parental leave policies. Parental leave allows parents to stay at home to care for their child after maternity leave.² While parental leave is unpaid in some countries, parents receive parental leave benefits in others. The benefit can amount to a flat-rate payment or it can be related to the amount of income received from paid work prior to the birth of a child. Countries also differ with respect to mothers' and fathers' eligibility. Parental leave weeks can be an individual right for either the mother or the father, or it can be a family right, so that parents are free to choose who is going to take the leave. For the assessment on the relationship between parental leave and fathers' involvement with their children, it is especially interesting to see whether fathers have the individual right for some of the family's parental leave weeks.

These basic parental leave characteristics - duration, benefit category, exclusive weeks for the father - are presented in table 1 for the countries and surveys analysed. Figure 1 displays that parental leave characteristics vary considerably between countries and points in time. As to the benefit category, we distinguish between no benefit, low benefit (i.e. flat-rate benefit or less than 60% of the wage), and high benefit (at least 60% of the wage). Parental leave duration varies from zero weeks (11 surveys) to 156 weeks in Germany in 2002. There is no parental leave benefit in a large number of surveys, especially in the earlier ones. Five surveys are in the low benefit category, and nine in the high benefit category. Exclusive weeks for the father are only found in the following surveys: Italy (2003), Netherlands (1995, 2000, 2005), Norway (2000), and Sweden (2000).

²We define parental leave as the leave available to both parents after the birth of a child or after maternity leave. Maternity leave and paternity leave (leave that fathers can take shortly after birth for a few days or weeks while the mother uses maternity leave, usually paid at 80-100% of the wage) are not considered here.

Table 1: Survey years and parental leave policies

	CA	FI	IT	GE	NL	NO	SW	UK
1971 - 1975	1971 duration: 0 w. benefit: 1 father weeks: no	1979 duration: 29 w. benefit: 2 father weeks: no			1975 duration: 0 w. benefit: 1 father weeks: no			1974 duration: 0 w. benefit: 1 father weeks: no
1976 - 1980					1980 duration: 0 w. benefit: 1 father weeks: no			
1981 - 1985	1981 duration: 0 w. benefit: 1 father weeks: no				1985 duration: 0 w. benefit: 1 father weeks: no	1981 duration: 12 w. benefit: 3 father weeks: no		1983 duration: 0 w. benefit: 1 father weeks: no
1986 - 1990	1986 duration: 0 w. benefit: 1 father weeks: no	1987 duration: 26 w. benefit: 3 father weeks: no	1989 duration: 26 w. benefit: 2 father weeks: no		1990 duration: 0 w. benefit: 1 father weeks: no	1990 duration: 12 w. benefit: 3 father weeks: no	1991 duration: 72 w. benefit: 3 father weeks: no	1987 duration: 0 w. benefit: 1 father weeks: no
1991 - 1995	1992 duration: 10 w. benefit: 3 father weeks: no			1992 duration: 104 w. benefit: 2 father weeks: no	1995 duration: 26 w. benefit: 1 father weeks: yes			1995 duration: 0 w. benefit: 1 father weeks: no
1996 - 2000	1998 duration: 10 w. benefit: 3 father weeks: no	1999 duration: 26 w. benefit: 3 father weeks: no			2000 duration: 26 w. benefit: 1 father weeks: yes	2000 duration: 33 w. benefit: 3 father weeks: yes	2000 duration: 72 w. benefit: 3 father weeks: yes	2000 duration: 13 w. benefit: 1 father weeks: no
2001 - 2005			2003 duration: 43 w. benefit: 2 father weeks: yes	2002 duration: 156 w. benefit: 2 father weeks: no	2005 duration: 26 w. benefit: 1 father weeks: yes			2005 duration: 13 w. benefit: 1 father weeks: no

Duration of parental leave in weeks. Benefit categories: 1: no benefit. 2: flat rate benefit or less than 60% of the wage. 3: at least 60% of the wage. Father weeks: parental leave weeks that can only be taken by fathers.

Sources: MTUS (2010); OECD Statextracts (2011); OECD (2011); Moss and Wall (2007); Moss and Korintus (2008); Columbia University (2011); own illustration.

Parental leave policies - regardless of their explicit aim - have an impact on time use decisions by couples. Depending on the duration of leave, the amount of benefits and whether it is an individual or a family right, leave schemes set different incentives that can have lasting effects on the division of labour between partners. Parental leave policies either reinforce traditional gender roles, supporting woman's role as caregiver and man's role as breadwinner, or they challenge traditional gender ideologies by promoting dual-earner/dual-carer strategies (Orloff 1996).

A long duration of parental leave theoretically implies high opportunity costs, so that - according to

economic theories - the partner with lower market resources, which is the woman in most cases, will use the leave. In addition, long parental leave schemes signalise the normative message that small children should be cared for by (female) family members. For example, at least until recently parental leave could be taken for up to three years in Austria, Germany and Spain - three countries with rather conservative and familialist structures (Neyer 2003). In contrast, short parental leave entitlements give incentives for both parents not to stay at home full-time for a long time, but rather to quickly return to the labour market. Of course, this aim can only be achieved if alternatives to parental care are well-established.

Across industrialised countries, parental leave benefits range from zero to full wage compensation. Instead of income-related benefits, some countries offer the same amount of benefits to all parents using leave. Economic theory predicts that, firstly, the likelihood to take parental leave increases as opportunity costs decrease, and secondly, the parent whose income losses would be lower would use parental leave. As in many families the men's earnings are higher than the women's, the share of fathers using parental leave would increase as benefits increase. In fact, high benefit rates are one of the strategies which Nordic countries use to promote the use of parental leave by fathers.

Finally, parental leave entitlements can be an individual or a family right. In Germany, for example, parents were able to share parental leave months according to their preferences between 1996 and 2006. In Norway, parents can share most of the parental leave months, but since 1993, several weeks have been reserved for the father on a "use-it-or-lose-it"-basis. In the Netherlands, since 1990 both parents can take three months of individual entitlement to parental leave. While parental leave reserved for the mother as well as leave that is a family right tends to reinforce the traditional division of labour, individual rights for the fathers to use parental leave aim at increasing father's involvement in childcare. According to Becker's approach, the parent who does the majority of childcare during the first years after the birth of the child will eventually completely specialise in unpaid work. Following the bargaining theory, shared parental leave, if accompanied by shared breadwinning, is likely to result in a dual-earner/dual-carer strategy in the long run, the parent with less market resources focusing relatively more on childcare and housework. In this case, family policies challenge prevailing gender roles by providing resources whose use can change couples' division of labour (Hook 2010). Indeed, several studies suggest a long-lasting effect on childcare involvement by fathers taking parental leave on their involvement in childcare (Ekberg et al. 2005; Duvander and Jans 2009; overview in Haas and Hwang 2008). But as Hook (2010) proposes, besides having a direct effect, policies also imply certain normative expectations about parents' behaviour. This signal can not only change the behaviour of fathers who used the resource, but all fathers' behaviour, because it legitimises fathers' caring for their children. A recent article by de Laat and Sevilla-Sanz (2011) supports this assumption of a "social externality effect" (de Laat and Sevilla-Sanz 2011: 110). They found that across OECD countries, men's individual contributions to home labour depend positively on men's average amount of home labour in their country.

In contrast to implications of mainstream economic theories, the doing gender approach and the economic model that includes identity point to the power of societal circumstances and hence the limitations of the impact of family policy on fathers' involvement with their children. According to these theories, as long as traditional gender ideologies are prevalent in society, women would strongly engage in childcare, even if parental leave schemes are designed to promote fathers' childcare and even if they are endowed with more market resources.

To sum up, parental leave policies have a threefold effect on fathers' childcare. First, they can lead to a higher participation by fathers in parental leave leading to higher childcare participation rates and a

higher number of minutes spent with the baby. Secondly, they can have long-lasting effects, i.e. fathers' taking parental leave resulted in higher childcare productivity and increased interest in spending time with their children in the long run. Thirdly, as policies actively promoting fathers' involvement with their children reduce fathers' loss of identity when performing childcare tasks, even fathers who did not use parental leave might become more engaged with their children. Nevertheless, the scope of family policy to change intra-family decisions on childcare participation and time allocation is limited by the prevailing norms and ideologies in a society.

4 Data and Sample

This study is based on data from the Multinational Time Use Study (MTUS, 2010), versions 5.52, 5.53 and 5.80. The MTUS provides representative samples of individual data with per minute diary records from 20 countries from the 1960s until the 2000s. A total of 69 different main activities are recorded. Childcare includes the following activities with / for children: preparing meals, feeding, putting to bed, medical and body care, looking after the child, helping with homework, reading something to the child, playing. Thus, all kinds of activities primarily done for or with the child are considered childcare.

Unfortunately, the data is limited to main activities only. Especially in terms of childcare scientists have argued that taking care of children can occur as secondary activity.³ E.g. a parent might do the laundry as main activity, while watching the child playing. Besides, "on-call" time (e.g. watching TV while the child takes a nap) and additional time for the children (e.g. talking to the child's teachers) is not captured. In addition, the quality of childcare time is not accounted for, but what parents do is crucial for the child's future development (Cabrera et al. 2000; Pleck and Masciadrelli 2004). Nevertheless, time use data are usually regarded as best source of data on people's time allocation, especially with regard to unpaid work (Monna and Gauthier 2008; Robinson 1985). Stylized questions on time use, in contrast, tend to lead to inaccurate ex post estimations of time use because of incomplete recall capability and the risk of social desirability bias (Monna and Gauthier 2008).

The analyses at hand are restricted to countries with at least two surveys per country at different points in time in order to capture changes over time. The following countries are analysed: Canada, Finland, Italy, Germany, the Netherlands, Norway, Sweden, and the United Kingdom. The number of surveys ranges from two in Germany and Sweden to seven in the Netherlands. The earliest survey was conducted in Canada in 1971, the latest surveys are from the Netherlands and the United Kingdom from the year 2005. For several countries, more than one diary day has been recorded. In order to account for the fact that some individuals are represented by several cases in the sample, individuals are clustered in the estimation procedure.

The sample consists of fathers who are married or cohabiting, are between 20 and 55 years old and have at least one child below the age of 18 in the household.

5 Model and Variables

The aim of this article is the analysis of the impact of parental leave characteristics on fathers' participation in childcare and time for childcare. The model is chosen in line with the assumption that fathers' participation in childcare is not random, i.e. fathers who participate in childcare are different from fathers

³See Monna and Gauthier (2008) for a discussion on childcare time as dependent variable.

not doing so. Applying a probit model for participation and an OLS model for fathers' childcare time would lead to consistent estimates if the population of interest for the probit equation is all fathers, and the population of interest regarding minutes of childcare is participating fathers. This possibility is explored in the sensitivity analysis, but for the main model we chose a model taking childcare participation selection into account. In particular, the full-information maximum likelihood estimator of the Heckman (1979) selection model is used. The estimator consists of two equations estimated simultaneously; a selection equation for participation in childcare and a main equation for the minutes of childcare, given participation. Participation in childcare, the dependent variable of the selection equation, is defined as zero minutes (non-participants) versus more than zero minutes of childcare (participants). The number of minutes of childcare on the diary day is the dependent variable of the main equation. The number of minutes fathers spend on childcare, y_{1j} , can only be observed if they participate in childcare at all. This condition can be expressed in the following equation:

$$y_{1j} = \begin{cases} x_j\beta + u_{1j}, & \text{if } y_{2j} > 0 \\ \text{not observed,} & \text{if } y_{2j} \leq 0 \end{cases} \quad (1)$$

x_j is a vector affecting the amount of time if the father participates ($y_{2j} > 0$). and u_{1j} is the error term. Whether a father participates in childcare therefore depends on y_{2j} which in turn is determined by the following selection equation:

$$y_{2j} = z_j\gamma + u_{2j} \quad (2)$$

z_j denotes the vectors affecting participation and u_{2j} is the error term. The log-likelihood functions for observing y_{1j} and not observing y_{1j} lead to the following model:

$$\ln L_j = \begin{cases} \ln\Phi\left(\frac{z_j\gamma + \frac{\rho}{\sigma}(y_{1j} - x_j\beta)}{\sqrt{1-\rho^2}}\right) - \frac{1}{2}\left(\frac{y_{1j} - x_j\beta}{\sigma}\right)^2 - \ln(\sqrt{2\pi}\sigma), & y_j \text{ observed} \\ \ln\Phi(-z_j\gamma), & y_j \text{ not observed} \end{cases} \quad (3)$$

The first line of equation (3) resembles the main equation for the amount of time used for childcare. the second line the probability of not observing time for childcare. If the confidence interval of ρ does not include zero with 5% error probability, the group of fathers participating in childcare is distinct from the group of fathers not involved in childcare. The selection methodology requires that at least one variable of z_j is not included in x_j . The age of the child is chosen as the selection variable. Precisely, the dummy variable "age of child between five and 17 years" is only included in the selection equation. Although this variable could also have an effect on fathers' childcare time, it seems to be most appropriate as selection variable for several reasons. Firstly, participation in childcare decreased markedly when the child becomes older according to related empirical literature and own analyses of the sample used in this article. Descriptive analysis reveals that 67% of fathers whose youngest child is aged four or younger report to take over some childcare, whereas only 29% of fathers whose youngest child is at least five years old report doing so. Secondly, other approaches, such as the instrumental variable approach, are not possible with the data at hand due to the limited number of variables available in all surveys.

As the impact of parental leave policies is the main objective of this study, the models account for the following parental leave characteristics: duration of leave in weeks, parental leave benefits (three categories), and exclusive parental leave weeks for the fathers (dummy variable). Regarding parental

leave benefits, these categories are considered: zero benefits, flat rate benefit or benefit equal to less than 60% of the wage, and at least 60% of the wage. Details on parental leave schemes in every country in every survey year are presented in table 1. The coding of parental leave variables depends on the parental leave scheme at the time of the birth of the youngest child. As the data do not provide information on the use of parental leave, we refer to whether a father has been eligible for certain parental leave measures after the latest birth. We argue that parental leave measures have an impact on the behaviour of all parents in a country, because it supports certain choices more than others (see section 2.2). The age of the youngest child is available in three categories: less than 5 years, 5 to 12 years, and 13 to 17 years. If a particular leave arrangement was available in the majority of years of a certain category, fathers are coded to have been eligible for this measure.⁴

The choice of additional independent variables is made according to their relevance for fathers' involvement in childcare as presented in related theoretical and empirical literature. The models account for the number of children, the age of the father and its square, his educational level and his work status. Educational level is coded in three categories: lower than completed secondary education (not completed ISCED⁵ level 3), completed secondary education (ISCED level 3 or 4), and above secondary education (ISCED level 5 or higher). As to the work status, it is distinguished between not employed, part-time employment, full-time employment and employment with unknown working hours. These categories refer to the general employment status, not to the amount of work on the diary day. Furthermore, a dummy variable for the diary having been filled out on a weekend-day instead of a weekday is included.

In order to make sure that the parental leave variables capture the pure effect of these policies, other macro-level factors that account for country- and time-specific differences that could possibly be related to fathers' participation and minutes of childcare are included in the model. Fathers' involvement is likely to depend on time cultures for paid and unpaid work found in the country in the survey year. For example, a couple's average time for housework around the year 2000 was 155 minutes in Italy but 69 minutes in Sweden, and it was 101 minutes in the Netherlands in 1975 but 78 minutes in 2005 in the same country. Hence, workload calculations for different kinds of unpaid work have been done whereby the sum of the average number of minutes men spend in an activity and the average number women spend in the same activity in a particular country and survey year have been used to define the term "workload". The workload for childcare captures the time- and country-specific childcare time culture. The workload for housework (not including cooking) accounts for time-flexible, the workload for cooking for time-flexible housework time-use culture (Hook 2010).⁶ The average number of work hours of part-time and full-time employed women as well as the average number of work hours of full-time employed fathers per country and year capture time- and county-specific cultures of paid work for both sexes. Finally, the female employment rate is used as an indicator for the presence of the dual-earner family model and, thus, modern gender roles and women's bargaining power. This indicator is especially useful as the data lack individual information on the mother's work status, which is usually assumed to have an impact on fathers' involvement with their children.⁷

⁴Example: Parental leave with a duration of 13 weeks have been introduced in Great Briatin in 1999. In the 2005 survey, coding is as follows: youngest child younger than 5 years old: duration=13; youngest child between 5 and 12: duration=0 because most fathers (age >6) could not have taken parental leave; youngest child between 13 and 17: duration=0 because no parental leave was available in the birth years of these children.

⁵International Standard Classification of Education.

⁶Housework includes common housework chores such as washing clothes, vacuum cleaning etc. It does not include shopping and gardening. Cooking (including food preparation, baking, preserving food, setting table, washing dishes etc.) is distinguished from other household work as it is a time-inflexible chore and hence differs from other household chores in terms of its predictors.

⁷See Reich's (forthcoming) results and overview of findings on the female partners' work status and fathers' childcare.

These macro-level variables are assumed to capture major differences in time cultures, but there might still be unobserved factors influencing fathers' childcare time on the aggregate level, e.g. per capita GDP. Therefore, a second model will be presented in which country dummies are included instead of the variables described above. Summary statistics of all variables can be found in the appendix.

6 Descriptive Statistics

The overall sample size amounts to 58,864 fathers of whom 26,435 participate in childcare. The country samples range from 2,897 in Norway to 16,208 in the Netherlands. The samples for cases with more than zero minutes of childcare range from 1,939 in Canada to 7,640 in the Netherlands. In relative terms, the percentage of participants varies from 18% in the United Kingdom in 1974 to 60% in Sweden in 2001. As figure 1 shows, the participation rate has gradually increased over time in almost all countries except for Sweden and Canada. In Sweden, participation was higher in 1991 than in 2000, and in Canada, participation peaked in 1986, with lower rates for the two earlier surveys (1971, 1981) and the two later surveys (1992, 1998). At the turn of the millennium the countries had reached different levels of participation. Participation was comparatively low in Italy (43%) and Finland (45%), but relatively high in Norway (57%) and Sweden (59%).

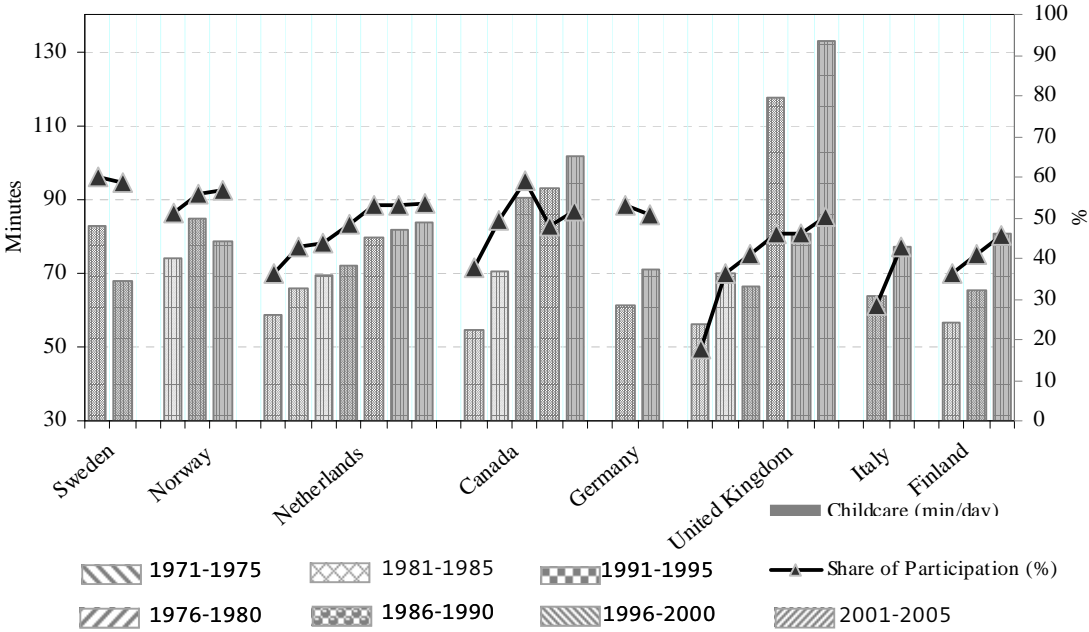
Similar to the participation rates, the average number of minutes participating fathers spend in childcare has increased in most countries over time. Between 1971 and 1980, fathers spent on average between 54 minutes (Canada) and 59 minutes (Netherlands) per day with their children. Between 2001 and 2005, this range lies between 68 minutes in Sweden and 132 minutes in the United Kingdom. In Sweden and Norway, however, the average number of minutes is larger in the second-last survey than in the latest survey.

Some changes in participation and minutes occurred simultaneously with major changes in parental leave legislation. Surprisingly, although exclusive parental leave weeks had been introduced in Sweden between the two surveys, both participation and minutes have dropped between 1991 and 2000. In Norway, major changes in family policy had occurred between the decline in minutes from 1990 to 2000. On the one hand, exclusive parental leave weeks for the fathers had been introduced, but on the other hand, parental leave had been extended from 12 to 33 weeks and, in addition, paid child-raising leave had been introduced which could be taken after parental leave. These last changes could have offset possible positive effects of exclusive father weeks. In the Netherlands, a relatively sharp increase in fathers' minutes of childcare is recorded between the surveys of 1990 and 1995, which coincided with the introduction of parental leave with exclusive weeks for both the father and the mother.

In the cross-country perspective, there is no clear correlation between participation or average number of minutes with regard to parental leave duration or benefit. However, participation is rather high for surveys with exclusive parental leave weeks for fathers, i.e. Sweden, Norway, and the Netherlands 1995 and later.

Figure 1:

Fathers' involvement in childcare: Share of participants and average minutes of childcare per day of participants, 1971-2005



Participants: childcare minutes > 0 on diary day. Sources: Multinational Time Use Study (2010); HWWI.

7 Regression Results

7.1 Participation in childcare

The results for the estimation of father's participation in childcare are presented in table 2. The first model (1.1) controls for country- and time-specific indicators of men's and women's time cultures, while the second model (1.2) controls for country fixed effects. With regard to parental leave policies, we find that the duration of parental leave has a positive, but very small impact on the likelihood that a father assists in childcare in both specifications. This result contradicts the hypothesis that parental leave durations reinforce the traditional gendered roles of family members. Two factors are likely to account for this finding. Firstly, three countries with comparatively moderate and long parental leave duration show high participation rates: Germany, Sweden and Norway. Secondly, regarding the longitudinal development of parental leave duration on the one hand and participation of fathers in childcare on the other hand, it is apparent that most countries extended parental leave duration over time. Simultaneously, participation rates have increased.

As expected, compared to no parental leave benefit, both low (flat-rate or less than 60% of the wage) and high (at least 60% of the wage) benefit rates have a positive impact on fathers' participation in childcare. If parents receive any benefit during parental leave, the likelihood that fathers participate in childcare is between 6% and 9% higher.

Table 2: Fathers' participation in childcare
Heckman selection model. selection equation. dependent variable: childcare participation

		1.1 childcare participation			1.2 childcare participation		
		marginal effect		std.	marginal effect		std.
				error			error
parental leave characteristics							
duration of parental leave (weeks)		0.001	***	(0.000)	0.001	***	(0.000)
parental leave benefit	no parental leave benefit	ref.			ref.		
	low: flat rate benefit or below 60% of the wage	0.069	***	(0.012)	0.062	***	(0.014)
	high: parental leave benefit \geq 60% of the wage	0.067	***	(0.014)	0.087	***	(0.016)
exclusive parental leave weeks for fathers		0.038	***	(0.012)	0.044	***	(0.011)
other country-level factors							
workload housework		0.000		(0.000)			
workload cooking		0.000		(0.000)			
workload childcare		0.002	***	(0.000)			
av. no. of work hours of part-time employed women		0.004		(0.004)			
av. no. of work hours of full-time employed women		-0.010	*	(0.005)			
av. no. of work hours of part-time employed men		0.000		(0.004)			
av. no. of work hours of full-time employed men		-0.002		(0.003)			
female employment rate		-0.001	*	(0.001)			
country dummies							
Canada					-0.024	**	(0.011)
Finland					-0.029	**	(0.014)
Germany					-0.083	***	(0.018)
Italy					-0.038	**	(0.016)
Netherlands					ref.		
Norway					0.001		(0.016)
Sweden					-0.036	*	(0.020)
United Kingdom					-0.048	***	(0.011)
individual level factors							
age of the youngest child	0-4	ref.			ref.		
	5-17	-0.265	***	(0.007)	-0.263	***	(0.007)
no. of children		0.019	***	(0.004)	0.018	***	(0.004)
father's age		0.034	***	(0.004)	0.036	***	(0.004)
father's age squared		-0.001	***	(0.000)	-0.001	***	(0.000)
educational level	low	ref.			ref.		
	medium	0.069	***	(0.007)	0.086	***	(0.007)
	high	0.128	***	(0.008)	0.150	***	(0.007)
employment status	not employed	ref.			ref.		
	part-time employment	-0.046	***	(0.018)	-0.062	***	(0.018)
	full-time employment	-0.085	***	(0.014)	-0.098	***	(0.014)
	unknown working hours	-0.107	***	(0.018)	-0.110	***	(0.018)
weekday or weekend	weekday	ref.			ref.		
	weekend	0.020	***	(0.004)	0.020	***	(0.004)

N=58864; p<0.10:*. p<0.05:**. p<0.01:***

Sources: MTUS (2010); OECD Statextracts (2011); OECD (2011); Moss and Wall (2007); Moss and Korintus (2008); Columbia University (2011); own calculations.

Exclusive parental leave weeks for fathers enhance fathers' participation by about 4% in both models. In other words, offering fathers several parental leave weeks which would be lost in the case that they do not claim them can be seen as an effective instrument to increase fathers' involvement in childcare.

Regarding individual-level factors, the results show that fathers are more likely to participate in childcare if they are older, have a medium or high level of education, have more children and if it is Saturday or Sunday. Fathers are less likely to be involved in childcare if they are in paid employment or if the youngest child is five years or older.

In model 1.1, some of the country-specific variables that control for time use cultures are significant, yet their impact is small in absolute terms ($\leq 1\%$). The workload of childcare is positively correlated with fathers' participation in childcare. In other words, the more total time on average that women and men spend with housework and childcare in a country in a given year, the higher the likelihood that a father participates in childcare. Surprisingly, the average number of working hours of full-time employed women and the female employment rate are negatively associated with fathers' childcare participation, but both the level of significance and the absolute impact are very small.

The country dummies in participation model 1.2 reveal that fathers' participation in childcare is significantly lower in all countries but Norway compared to the reference country, the Netherlands. Participation does not significantly differ between Norway and the Netherlands.

7.2 Time for childcare

Table 3 shows the results for fathers' minutes spent on childcare per day, controlling for the selection into childcare. Looking at the impact of parental leave policies, we see that parental leave weeks are negatively associated with fathers' time with children in model 2.1 but positively in model 2.2. The effect in absolute terms is very small (< 1 minute), but still worth exploring. While the national-level control variables in model 2.1 account for differences across countries and time, the country dummies in model 2.2 only capture differences between countries. Hence, the seemingly contradicting results can be interpreted as a negative impact of long parental leave after controlling for time use cultures across countries and time, while the positive impact in model 2.2 partly arises from the trend in time, as both fathers' childcare time and parental leave duration have generally increased over time.

Exclusive parental leave weeks for fathers increase fathers' childcare time by 4 to 5 minutes in both models. In other words, the availability of parental leave weeks earmarked to the father right after the child's birth leads to fathers spending more time with their children even after parental leave can be taken. High parental leave benefits do not significantly differ from no benefit in model 2.1, but increase fathers' childcare time by almost 20 minutes in the second model with country dummies. Low benefits increase fathers' childcare time by 9 to 10 minutes in both models. Thus, fathers spend more minutes on childcare when parents receive parental leave benefits.

The workloads of housework and childcare are positively correlated with fathers' daily minutes for childcare in model 2.1. If either activity increases by one minute, fathers' time for childcare is increased by less than one minute. The average number of work hours for women negatively affect fathers' minutes of childcare (part-time: -2, full-time: -4 minutes), but the average work hours for employed men show a positive effect of about 2 minutes. This finding contradicts the assumption that long work hour cultures for employed women and shorter work hour cultures for men facilitate fathers' time for children.

Table 3: Fathers' minutes of childcare per day, main equation
 Heckman selection model. main equation. dependent variable: minutes of childcare on the survey day

		2.1 childcare			2.2 childcare		
		minutes			minutes		
		b-coefficient	std.		b-coefficient	std.	
			error			error	
parental leave characteristics							
duration of parental leave (weeks)		-0.08	***	(0.025)	0.15	***	(0.032)
parental leave benefit	no parental leave benefit	ref.			ref.		
	low: flat rate benefit or below 60% of the wage	9.90	***	(3.154)	8.78	***	(3.757)
	high: parental leave benefit \geq 60% of the wage	1.95		(3.361)	19.65	***	(3.599)
exclusive parental leave weeks for fathers		4.98	**	(2.045)	4.43	**	(1.915)
other country-level factors							
workload housework		0.19	***	(0.037)			
workload cooking		-0.06		(0.048)			
workload childcare		0.31	***	(0.034)			
av. no. of work hours of part-time employed women		-1.61	**	(0.751)			
av. no. of work hours of full-time employed women		-3.68	***	(1.390)			
av. no. of work hours of part-time employed men		1.96	**	(0.863)			
av. no. of work hours of full-time employed men		1.51	***	(0.573)			
female employment rate		0.05		(0.149)			
country dummies							
Canada					18.28	***	(3.252)
Finland					-18.20	***	(3.206)
Germany					-31.98	***	(3.838)
Italy					-8.92	**	(3.895)
Netherlands					ref.		
Norway					-13.55	***	(3.555)
Sweden					-30.23	***	(3.823)
United Kingdom					9.49	***	(2.229)
individual level factors							
no. of children		1.37	*	(0.816)	1.20		(0.816)
father's age		-0.84		(0.833)	-0.42		(0.820)
father's age squared		0.01		(0.011)	0.00		(0.011)
educational level	low	ref.			ref.		
	medium	-1.94		(1.467)	0.46		(1.434)
	high	1.68		(1.571)	3.17	**	(1.578)
employment status	not employed	ref.			ref.		
	part-time employment	-16.96	***	(4.419)	-17.07	***	(4.427)
	full-time employment	-22.81	***	(3.681)	-23.73	***	(3.640)
	unknown working hours	-25.23	***	(4.604)	-23.95	***	(4.594)
weekday / weekend	weekday	ref.			ref.		
	weekend	23.52	***	(1.093)	23.40	***	(1.095)
constant		146.65	***	(54.563)	136.95	***	(15.785)

N=26435; $p < 0.10$:*. $p < 0.05$:**. $p < 0.01$:***. Confidence interval of ρ : model 2.1: -0.355 - -0.305; model 2.2: -0.330 - -0.278.
 Sources: MTUS (2010); OECD Statextracts (2011); OECD (2011); Moss and Wall (2007); Moss and Korintus (2008); Columbia University (2011); own calculations.

As to the country dummies, fathers spend significantly more minutes of childcare in Canada and the United Kingdom than in the Netherlands, while fathers spend significantly less time with their children in all other countries, as compared with Dutch fathers.

Regarding the individual-level factors, only the three types of employment status and the weekend dummy have a consistent impact on fathers' time with their children in both models. The negative effect compared to no employment is smallest for part-time employment (-17 minutes), followed by full-time employment (-23 / -24 minutes) and unknown work hours (-25 / -24 minutes). Fathers spend almost 24 minutes more with their children on weekends than on weekdays according to both specifications.

Comparing the influence of individual-level factors on fathers' participation with their impact on fathers' childcare time, it can be concluded that childcare minutes of participating fathers are mainly subject to time scarcity (work status, weekend versus weekday), while participation is not only influenced by time use variables, but also by fathers' age and educational level as well as their children's characteristics. Thus, it is likely that fathers participating in childcare are different from fathers not participating in childcare. This assumption is confirmed by the result for the confidence interval of ρ , which does not include zero.

7.3 Robustness Checks

Several variations of the models have been estimated in order to test the robustness of the results.⁸ For instance, they have been estimated without exclusive parental leave weeks for the father, and again without parental leave benefit categories, in order to test whether these variables affect each other and other variables. Besides these, the models have been estimated for children below the age of 13 instead of below 17, and the results are the same in terms of significance and direction of the effect. Furthermore, as the development in Sweden towards less participation and less minutes contradicts the general trend in other countries, it was tested whether the results are the same without the Swedish surveys. We also estimated the models without the British surveys from 1995 and 2005, because of the unusual high average number of childcare minutes in these samples.⁹ All of these models confirm the results for parental leave variables presented in sections 7.1 and 7.2.

Next, we tested whether the relationship between parental leave duration and the dependent variables is linear by inserting the squared parental leave duration into the models. Results show that the relation is, in fact, not linear, but the positive effect decreases as the number of weeks rise. As this variable seems to be highly correlated with other parental leave characteristics, it was not included in the main models presented above.

Results for estimations with three categories for the age of the youngest child (0-4, 5-12, 13-17 years old) instead of two categories slightly differ with respect to parental leave variables. As to participation in childcare, parental leave benefit categories and exclusive parental leave weeks for the father become not significant in model 1.1, while parental leave duration and low benefit rate lose their significance in model 1.2. Hence the positive impact of low parental leave benefits instead of no benefit seems to be the most unstable result. Findings for minutes of childcare are mainly robust, only in model 2.2, exclusive parental leave weeks for fathers become non-significant.

Finally, OLS models for fathers' minutes of childcare have been carried out, i.e. models not controlling

⁸The tables are available from the authors upon request.

⁹Excluding the 1995 and 2005 surveys from the UK from the analysis does not change the results with respect to parental leave characteristics, probably because of the small number of fathers in these samples. However, in the equation for childcare minutes, the positive result for British fathers disappears, and they do not significantly differ from Dutch fathers anymore.

for selection. The only difference worth comment is that, in the case of the regression on fathers' minutes controlling for macro-level factors for time use cultures instead of countries, parental leave duration has a positive impact by a fraction of a minute. This result is probably a combined result of selection and amount of time, as non-participating fathers are included in this model.

To sum up, various robustness checks broadly confirm the results presented in sections 7.1 and 7.2.

8 Conclusion

This article presents cross-national and cross-time analysis that contribute to the empirical evidence for predictors of fathers' childcare mainly in two ways. Firstly, it accounts for the fact that a considerable number of fathers not involved in childcare on the survey day are true "non-participants", hence distinguishing between fathers' participation in and time used for childcare. Secondly, we test whether parental leave characteristics - duration of leave, amount of benefits, exclusive father weeks - affect fathers' childcare participation and minutes. Two different specifications are presented, the first controlling for time-use cultures that vary by country and time, and the second controlling for country effects.

Descriptive analysis shows that fathers' participation in childcare has risen in five of the eight countries over time. Likewise, the amount of time participating fathers spend with their children has increased in six countries. The multivariate analysis suggests that fathers participating in childcare are distinct from those not taking advantage of this opportunity. Furthermore, it reveals that predictors for fathers' participation differ from predictors of fathers' minutes of childcare.

The regressions deliver detailed results for the impact of parental leave characteristics. Most importantly, exclusive parental leave weeks for the father have a positive effect on both fathers' participation in childcare and the amount of time participating fathers spend with their children. This is in line with the hypothesis that exclusive father weeks are an incentive for fathers to spend time with their children in the long run. Robustness checks have revealed that this result is robust to many changes in the model specifications.

The duration of parental leave also affects participation positively. This contradicts the assumption that long parental leave promotes the specialisation of mothers in childcare (and housework), but robustness checks have revealed that the correlation is not linear. Duration of leave has a negative impact on fathers' minutes of childcare in the model controlling for macro-level indicators of time-use cultures, but a positive impact in the second specification with country dummies. We interpret this as there is a negative effect net of time and space effects, while there is a positive effect across time, net of country effects.

Parental leave benefits of any amount are positively related to fathers' participation in childcare in both models (1.1, 1.2), and father's minutes of childcare in model 2.2. Probably, the macro-variables on time use cultures in model 2.1 better account for the fact that parental time investments in childcare can be low where high-quality public childcare facilities are available than the country-dummies in model 2.2, so that high benefit levels become insignificant. Extensive public childcare and high parental leave benefit rates are both common in Scandinavian countries (Kitterod and Petterson 2006).

We conclude that, firstly, leave duration, benefit rate and fathers' exclusive rights have effects on fathers' childcare participation and time, but that they also have to be interpreted collectively, as countries with high participation by fathers show medium leave durations, high benefit levels and exclusive parental leave weeks for fathers. Secondly, we propose viewing parental leave characteristics as small but important elements of a broad cultural and institutional framework that influences fathers' involvement in childcare.

Countries with parental leave schemes that are attractive for fathers probably support fathers' childcare through other channels as well, so that single characteristics lose significance once controlled for country-specific effects in the analysis. Stated differently, changing one parameter within a certain cultural and institutional setting might not be sufficient to generate long-lasting effects on the gendered division of time. On the cultural side, fathers' involvement in childcare needs ideological support from society. On the institutional side, other family policies (e.g. tax system) and labour market characteristics (e.g. mothers' career prospects) have to support incentives for fathers to get involved with their children. To sum up, we propose that a country's family and labour market policy has to be geared into the same direction if aiming at changing the gendered division of childcare.

The study at hand provides new insights on fathers' childcare and the role of parental leave policies which generate new questions within this topic. While diaries of time use have many advantages and are generally viewed as the best source for data on people's time allocation as they are more valid than data from stylized questions in retrospective questionnaires, some issues cannot be addressed with this source. For example, the data at hand do not contain information on the quality of time, but empirical research has revealed that fathers are more likely to play with their children while mothers satisfy their basic needs (Pleck 1997). Hence, it would be interesting to analyse fathers' participation and amount of time in childcare for different types of care, e.g. playing versus washing and feeding, against the backdrop of different family policies. Furthermore, it was not possible to control for the partners' characteristics (e.g. work status), for the presence of another adult or for activities that were done simultaneously with childcare. Thus, the extent to which fathers are taking over the main responsibility for their children and how this is affected by family policy cannot be investigated with the data at hand. Besides, the time use data provides only information about few days in people's lives. It would be interesting to see if our results hold for longer reference periods. The response to these questions is left for further research.

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Appendix

summary statistics

variable	sample size	mean	std. dev.	min.	max.
childcare participation	58,864	0.449	0.497	0.00	1.00
minutes of childcare	58,864	32.994	58.464	0.00	800.00
duration of parental leave (weeks)	58,864	30.823	43.531	0.00	156.00
no parental leave benefit	58,864	0.521	0.500	0.00	1.00
flat rate benefit or below 60% of the wage	58,864	0.338	0.473	0.00	1.00
parental leave benefit \geq 60% of the wage	58,864	0.142	0.349	0.00	1.00
exclusive parental leave weeks for fathers	58,864	0.116	0.321	0.00	1.00
workload housework	58,864	104.116	24.675	66.60	155.14
workload cooking	58,864	135.679	26.204	58.22	189.23
workload childcare	58,864	112.212	25.391	51.56	195.52
av. no. of work hours of part-time employed women	58,864	17.148	2.041	13.54	20.46
av. no. of work hours of full-time employed women	58,864	39.039	1.129	36.09	40.98
av. no. of work hours of part-time employed men	58,864	15.672	1.688	12.18	18.35
av. no. of work hours of full-time employed men	58,864	42.496	1.859	39.35	47.44
female employment rate	58,864	59.229	11.409	31.70	81.10
Canada	58,864	0.072	0.258	0.00	1.00
Finland	58,864	0.088	0.283	0.00	1.00
Germany	58,864	0.156	0.362	0.00	1.00
Italy	58,864	0.154	0.361	0.00	1.00
Netherlands	58,864	0.275	0.447	0.00	1.00
Norway	58,864	0.133	0.339	0.00	1.00
Sweden	58,864	0.074	0.261	0.00	1.00
United Kingdom	58,864	0.049	0.216	0.00	1.00
age of the youngest child: 0-4	58,864	0.420	0.493	0.00	1.00
age of the youngest child: 5-17	58,864	0.580	0.493	0.00	1.00
no. of children	58,864	1.862	0.847	1.00	9.00
father's age	58,864	38.934	7.191	20.00	55.00
father's age squared	58,864	1567.6	565.2	400.0	3025.0
educational level: low	58,864	0.345	0.475	0.00	1.00
educational level: medium	58,864	0.386	0.487	0.00	1.00
educational level: high	58,864	0.268	0.443	0.00	1.00
work status: not employed	58,864	0.047	0.212	0.00	1.00
work status: part-time employment	58,864	0.072	0.258	0.00	1.00
work status: full-time employment	58,864	0.831	0.375	0.00	1.00
work status: unknown working hours	58,864	0.051	0.219	0.00	1.00
weekend	58,864	0.370	0.483	0.00	1.00

Sources: MTUS (2010); OECD Statextracts (2011); OECD (2011); Moss and Wall (2007); Moss and Korintus (2008); Columbia University (2011); own calculations.

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