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# Parental leave policies and child care time in couples after childbirth

Pia S. Schober

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# **Parental leave policies and child care time in couples after childbirth**

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## **Abstract**

This research explores how different parental leave reforms in West Germany impacted on the time mothers and fathers in couples spent on child care. I investigate indirect effects through mothers' labor market return decisions more in detail than previous studies and also examine potential direct associations of reforms of the leave period and benefits with maternal and paternal care time. The analysis uses multilevel multiprocess models for 1299 couples with a first or second birth based on data from the German Socio-Economic Panel (1984-2009). I estimate simultaneously the timing and extent of mothers' labor market return, selection into childbearing, and maternal and paternal child care time over the years following a first or second birth. The findings suggest that the extensions of the maximum period of low-paid or unpaid leave between 1986 and 1992 and the introduction of shorter well-paid leave and two 'daddy months' in 2007 indirectly affected maternal and paternal child care through changes in mothers' work return decisions. Even after controlling for these indirect effects and fathers' take-up of leave, the parental leave extensions were directly associated with longer maternal care time on weekdays, whereas father involvement in child care increased after the 2007 reform.

**Keywords:** child care; gender division of unpaid work; maternal employment; parental leave policy; parenting

## **Introduction**

Governments in many OECD countries have extended mothers' and increasingly also fathers' entitlements to childbirth-related leave over the past decade. In 2011, post-natal statutory leave entitlements which give parents the right to return to the same or a similar job after the leave varied from none in the United States to three years or more in Germany, Finland, Sweden, Norway, Croatia, Czech Republic, Hungary, Estonia, Poland, Portugal, Spain, and Greece (International Network of Leave Policies & Research 2011). The proportion of leave period which is paid and the level of pay differ widely between countries. West Germany is used as an example of a country with a tradition of long leave entitlements for mothers which has implemented different types of parental leave reforms over the past decades. Some of these extended only the period of leave available to parents, two reforms modified also the level of benefit received during the leave, one reform introduced greater flexibility in take-up, and the most recent reform also included specific incentives to encourage take-up by fathers. This research investigates what consequences these changes in leave policies in Germany since the 1980s had for the division of child care in couples. Specifically, I investigate whether different modifications in leave entitlements affected maternal and paternal child care time indirectly through mothers' labor market return decisions or also more directly, for instance, by influencing normative gender arrangements and parenting values. The impact of parental leave durations and compensation rates on the speed of labor market return of mothers and their hours worked upon return has been widely confirmed. So far changes in child care time of mothers and their partners after parental leave reforms have not been investigated. Indirect policy effects through mothers' labor market return are explored more in detail than in previous research by considering how the hours mothers work for pay upon their labor market return as well as the duration of the interruption affect maternal and paternal care time after a birth.

This research adds to the growing body of evidence, which has suggested that the amount of time mothers and fathers spend on childcare is context-dependent. Studies on macro-level trends in child care time found increases in mothers' childcare time despite the rise in their labor market participation and greater childcare involvement of fathers in recent decades (Bianchi 2000; Gauthier, Smeeding and Frank F. Furstenberg 2004; Kan, Sullivan and Gershuny 2011; Sayer, Bianchi and Robinson 2004). Researchers also noted a trend towards greater time investments in parent-child shared activities which promote children's development (Bianchi, Robinson and Milkie 2006; Hays 1996). Recent studies have explored the importance of socio-political context for parents' absolute time contributions to child care and for the level of gender inequality in care time. Hook (2006; 2010) has argued that policies which facilitate reconciling work and family for women and men, such as working time regulations, early years education and care provision, and parental leave policies may have a more direct impact than most other contextual variations. She found that fathers spent less time on unpaid work, including child care, in countries with longer parental leave for mothers and do more of these tasks in countries where fathers were eligible to take leave and where employed women on average worked longer hours. Craig and Mullan (2011) showed that cross-national differences between Australia, France, Italy and Denmark in the division of child care between mothers and fathers in couples were largely in line with expected effects of the corresponding policy package of the country. These studies were based on repeated cross-sectional comparisons of individuals or couples either using multilevel models of a large number of diverse countries or detailed descriptions of a handful of countries. These studies therefore give us an idea of broad associations of macro-level indicators and micro-level child care behavior but do not allow a more detailed study of the transfer mechanisms from policies or social norms to child care time allocation within couples.

Across different welfare state contexts, mothers' labor market status is an important influence of the amount of time mothers spend with children {Craig, 2011 #958; Bianchi, 2006 #261; Sayer, 2011 #946}. This is not surprising, as in most families with young children mothers are still the main care givers. An increase in women's hours in paid work, however, does not correspond with a one-by-one reduction in childcare hours. Full-time employed mothers preserve similar levels of interactive or primary care time with their children as mothers in part-time jobs and reduce mainly routine tasks and passive childcare time (Bianchi, Robinson and Milkie 2006; Craig 2007; Craig and Mullan 2011; Sayer and Gornick 2011). Findings relating to associations of mothers' employment with fathers' absolute contributions to child care are more complicated. Most studies find that fathers are more involved in child care in households where mothers work for pay (Craig and Mullan 2011; O'Connell 1993; Sullivan et al. 2009). Fathers in dual full-time worker households in Australia, the US, Italy, France, and Denmark engaged more in routine child care tasks and spent more time alone with the child without the mother present (Craig and Mullan 2011). Recent evidence from Norway and the UK, however, suggests that paternal care involvement was greater when mothers worked part-time rather than full-time, whereas the relationship between mothers' work hours and fathers' child care time was positive and linear in Sweden (Sullivan et al. 2009). Most of these studies were based on cross-sectional time use data, which provide the best available measurements of child care time, but do not allow considering changes over time and unobserved characteristics which may influence women's employment decisions and their own and their partners' child care time.

The effects of parental leave policies on maternal employment have been investigated in many countries. Extensions of paid leave have been generally found to delay mothers' labor market return during the period for which the leave is available. The longer-term effects of leave extensions on mothers' labor force participation depend on the level of leave benefits

and on the total length of leave available. Paid leave up to durations of approximately one year after childbirth has been found to increase the probability of mothers' return at the end of the leave (Pronzato 2009; Ruhm 1998; Waldfogel, Higuchi and Abe 1999), whereas some studies reported negative or non-significant relationships with paid leave beyond the first year after childbirth (Ondrich et al. 2003; Schoenberg and Ludsteck 2007). Paid leave of moderate length seems to encourage more mothers to return to their previous jobs at the end of the leave, who in absence of the leave entitlement might have left the labor market for extended periods of time. By contrast, very long leave with low pay may promote more traditional conceptions of motherhood, which view employment as incompatible with child care responsibilities. Higher benefits paid during the leave are associated with increased leave take-up by mothers and fathers (e.g., Brandth and Kvande 2001). Higher income compensation rates, however, also increase the volume of mothers' labor force participation upon re-entry, as they create stronger incentives to compensate for the discontinuation of the benefits through earned income at the end of the leave (e.g., Schoenberg and Ludsteck 2007). Whereas a lot of studies have investigated parental leave policy effects on maternal employment, so far few studies exploit changes in these policies over time to look more in detail at possible influences on mothering and fathering and the division of child care in couples.

Previous research on leave policies and maternal employment simply assumed that longer periods out of the labor market increase mothers' time with their children but the detailed mechanisms have received little attention. This seems crucial to better understand how mothers' involvement in paid work mediates parental leave policy effects on maternal and paternal child care time. This also reduces the risk of compounding the effects which a policy reform had on maternal employment on the one hand and on maternal and paternal child care time on the other. This research uses longitudinal couple data and focuses on couples who



just had a child, the subgroup of the population which is most directly affected by maternity/paternity and parental leave policies. By observing several reforms of parental leave policies in West-Germany over the past decades, I provide a more detailed exploration than previous studies of how specific reforms impacted directly and indirectly, through mothers' employment, on maternal and paternal care time. This contributes to a better understanding of the complex relationships between leave policy reforms and parenting changes at the couple level.

### **Parental leave and other contextual variations in Germany**

The male breadwinner/ female part-time carer model has become the predominant arrangement how couples with young children combine earning and caring in West Germany, whereas a greater share of mothers still work full-time in East Germany (Lewis, Campbell and Huerta 2008; Misra, Budig and Böckmann 2010). The traditional male breadwinner family in which mothers are mainly seen as second earners has been encouraged by joint income taxation for couples (for details see Steiner and Wrohlich 2004) and incentives for part-time work. Part-time workers in Germany have been entitled to the same employment protection rights as full-time workers since 1985 and laws giving employees the right to request a reduction of working time came into force in 2001. The share of part-time employed women as percentage of all employed women increased from 25 percent in 1985 to 38 percent in 2008 (OECD 2010).

The level of publicly subsidized childcare provision (in terms of places as well as opening hours) for children under the age of three was and still is very low in West Germany.

Coverage has been much higher in East Germany and for older children (Immervoll and Barber 2005). Since 1996, children were legally entitled to a kindergarten place from the age of 3. In 1991, there were 54 places per 100 children under three years in the Eastern states

compare to 2 places in West-Germany. In 2009, 12 and 41 percent of children under three attended state-subsidized formal daycare facilities in West- and East-Germany, respectively (Goldstein et al. 2010).

Since 1968 employed mothers in Germany had the right to fully-paid maternity leave for six weeks before and eight weeks after childbirth. In addition, they were entitled to 4 months of additional leave with income-related reimbursement with a maximum payment of 255 Euros per month. All subsequent reforms of parental leave left the mother protection period of eight weeks after birth at full pay unchanged. Several extensions of the job-protected leave period took place in Germany since the mid- 1980s. The main aim of these reforms was to encourage mothers to spend more time with their children during the early years, as this was regarded as beneficial for children's welfare. In 1986, a job-protected parental leave of 10 months (including the 2-month mother protection period) was introduced. The parental leave entitlement was extended from 10 months to 12 months in 1988, to 15 months in July 1989, to 18 months in July 1990 and to 36 months in 1992.

After 1986, mothers or fathers on leave were entitled to receive a child-rearing benefit which was a means-tested flat rate of about €300 per month. This was paid to all parents on leave for the first six months. After that benefits were reduced on a sliding scale based on household income. Families could receive the child care benefit for the whole leave period before 1992 and for up to 24 months from 1992 to 2006. In 1987, 83 percent of all families received the full benefit for the whole leave duration (Koch 2000). The benefit was not linked to inflation; therefore the percentage of families which received the maximum amount of benefit for the whole leave period declined to 52.2 percent by 1998 (Koch 2000). Even if one parent received the benefit for the whole period, relative to net median earnings of a couple with one earner and two children its value was modest, never exceeding 20 percent and declining over time.

Two reforms in 1998 and 2001 introduced more choice and flexibility in take-up to facilitate faster (part-time) labor market re-entry for mothers. From 1998, parents had the option of receiving €450 per month if they reduced the benefit period to one year. From 2001, both partners were permitted to take leave simultaneously and the threshold of part-time work during the leave period was raised from 19 hours to 30 hours per week (Bundesministerium für Familie 2002; 2006).

As a response to very low fertility rates which were partly attributed to the lack of institutional support for mothers' employment, the German government introduced a major parental leave reform in 2007. Its explicit aim was to speed up maternal labor market return and increase take-up of leave by fathers. An income-related reimbursement at 67 per cent of net earnings or a minimum of €300 Euros for 12 months was introduced. Parents remained entitled to job-protected leave of 36 months in total but 24 months of it were now unpaid. The reform also included an individual leave entitlement of two months which were reserved for each parent and were otherwise lost to the family. Before 2007, less than 2 per cent of fathers took some child care leave. After 2007, the percentage of fathers taking child care leave slowly rose to 23 percent in 2009 (Reich 2010; Statistisches Bundesamt 2010). For all but two of the parental leave changes, the reforms were passed and newspaper articles about the reforms appeared only a couple of months before they came into effect. Couples therefore could not anticipate the reforms before planning the pregnancy. The only two exceptions were the extensions of the leave period in 1988 and 1990. These were already planned in 1986 and 1989, respectively (Schoenberg and Ludsteck 2007).

The analysis focuses on West-Germany, as most of the parental leave extensions were implemented before or just after the German re-unification, which gave rise to fundamental demographic and economic changes in East Germany. As a result of these parallel trends, I

am unable to identify associations with specific parental leave reforms in East Germany. In West Germany there were few other changes in relevant family and labor market policies which would have strongly affected parents with young children. Work hours regulations and income taxation rules remained largely unchanged. Ideally I would like to investigate how the increase in day-care availability was associated with child care time in couples alongside the effects of parental leave policies. Unfortunately comparable data on regional and temporal variations in day-care availability are only available for 1990, 1994, 1998, and 2002. Including them would result in a much smaller sample and fewer observed parental leave reforms. I only used these data for robustness checks.

## **Theoretical framework**

### *Direct and indirect leave policy effects*

In this article, I am concerned with teasing apart the influence of parental leave policies on mothers' labor market return decisions and on the normative gender and parenting context in couples, in which mothers and fathers decide about the time they spend with their children. The aim of this study is to identify plausible causal relationships between changes in parental leave policies, maternal labor market return, and child care time of both partners in couples. To substantiate this argument, I explore in detail probable direct and indirect effects of parental leave policies on the division of child care in couples and apply a suitable methodological approach to reduce the risk of bias. Despite these precautions, there remains a small risk of over- or underestimation due to potential time-varying unobserved factors or measurement errors.

One important pathway how parental leave policies are likely to influence parental care time is through their impact on maternal labor market return. The analysis therefore differentiates between these indirect effects and more direct policy associations with child care time of new

parents. There may be other mediating factors such as fathers' care-related labor market interruptions but these occur less frequently and will be considered only as control variables. 'Direct' effects are understood as the associations of leave policies with child care time of mothers and fathers after accounting for the indirect effects through maternal employment decisions. Strictly speaking, these may not be direct, as they may operate through changes in unobserved norms and values. Due to data limitations, the interplay with normative factors unfortunately cannot be considered in this analysis. I first discuss the predicted policy effects on maternal labor market return decisions based on the literature and how the latter are likely to influence maternal and paternal care time in couples. In a second step, I formulate hypotheses how leave variations may also impact more directly on child care time in couples.

#### *Indirect parental leave policy effects on child care time*

The first five parental leave reforms in the late 1980s and early 1990s mainly consisted of piecewise extensions of the length of leave available to parents. They involved hardly any changes in the relatively low level of benefits received, except that the percentage of families which received this benefit for the whole period declined slowly over time due to means-testing. The leave extensions in 1988, 1989, 1990, and 1992, which went beyond one year total leave, reduced the probability of mothers' labor market return (Ondrich et al. 2003; Schoenberg and Ludsteck 2007). Although unpaid leave generally has been found to have smaller effects than paid leave, Schoenberg and Ludsteck (2007) found significant delays in German mothers' labor market return also during the second and third year for which only unpaid leave was available after 1992.

The reform in 1998 gave parents the choice to take only one year of leave and receive a 50-percent higher benefit rate. This would be assumed to slightly increase mothers' probability of labor market return. Higher income compensation rates have also been found to increase the

volume of mothers' labor force participation upon re-entry. In 2001, the threshold of part-time work hours during periods of leave was increased from 19 to 30 hours per week and both parents could take leave simultaneously. Large effects of this in the form of longer (part-time) work hours of mothers upon re-entry were, however, unlikely, as due to the means-testing longer hours reduced mothers' chance to qualify for the child-rearing benefit.

The 2007 reform significantly increased the average level of parental leave benefit received by mothers through the introduction of an income-related compensation of leave for one year without means-testing. This reform sped up maternal labor market return and also increased the volume of mothers' labor market participation after the return (Bergemann and Riphahn 2010; Spiess and Wrohlich 2008). Since 2007, fathers have also been eligible to two 'daddy months' which are lost to the family if the father does not take them up. This increased fathers' take-up of leave (Reich 2010; Statistisches Bundesamt 2010).

The consequences of longer periods out of the labor market for mothers on their own and their partners' child care time have not been investigated in detail. With growing duration of women's employment interruption, the specialization of women in household labor may involve improved child care skills (Becker 1981) and children may form a stronger attachment with the mother. Furthermore, women's bargaining power and possibility to sanction the lack of help with child care from men decrease (Lundberg and Pollak 1996). Some women may also adapt their expectations regarding the gender division of labor and parenting to the practice they developed since childbirth, which conforms to traditional gender ideologies and a culture of intensive mothering. As a result of these mechanisms, I predict that women will spend more time on child care with increasing length of their labor market interruption (*Hypothesis 1*). A recent study found support for such an effect on mothers' housework time after childbirth in Britain and West Germany (Schober 2011).

Fathers' responses to mothers' longer periods out of the labor market may take two forms, depending on the extent to which maternal and paternal time with children are substitutes or complements. Fathers may either reduce their child care because they feel less needed or responsible with increasing duration of mothers' labor market interruption, or they may increase their child care time to spend shared leisure time with their spouse and children. It is therefore unclear whether fathers will do more or less child care with increasing length of mothers' time-out or whether the two effects will offset each other.

In line with the time availability perspective (Blood and Wolfe 1960), previous research has provided ample evidence of the importance of women's employment status for women's child care time and the relative division of child care (e.g., Craig and Mullan 2011). German mothers can increasingly choose whether they want to return to their job full-time or part-time. Longer work hours usually result in greater reductions in mothers' child care time, even though mothers seem to reduce passive child care time more than time spent talking and playing with children (Bianchi et al. 2000). Previous results also suggest that mothers' employment increases fathers' child care time, whereas the results for mothers' longer work hours have been mixed (e.g., Sullivan et al. 2009). In the German context with low provision of formal child care for very young children, I would expect that fathers constitute an importance source of child care for mothers who spend substantial hours in formal employment. I therefore expect that longer hours in formal employment of mothers not only reduce mothers' child care time but also increase fathers' time with children, in particular on weekdays (Hypothesis 2).

Building on Hypothesis 1, the extensions of (partly paid) leave (in 1988, 1989, 1990, and 1992) beyond one year after childbirth are assumed to have indirectly raised the time women spent on child care by increasing the length of their labor market interruption and reducing the

likelihood of being in employment at each respective interview after childbirth (Hypothesis 3). As explained above, the predicted indirect impact of these leave extensions on paternal care time is unclear.

In accordance with Hypotheses 1 and 2, I predict that the introduction of well-paid leave for only one year introduced in 2007 indirectly reduced maternal care time through faster return and longer work hours by mothers after they re-entered the labor market. I also expect a positive effect on paternal care time due to increased work hours of mothers, whereas the indirect effect as a result of shorter leave durations is unclear (Hypothesis 4). The 1998 and 2001 reforms may also have had small indirect effects through reduced work interruptions and longer part-time hours upon return. As a result of the lower compensation rates and means-testing of the benefits, the strength of these effects however should be much smaller than for the 2007 reform.

#### *Direct effects on child care time*

Parental leave policies may also influence the child care contributions of men and women by shaping their normative expectations of what it means to be a good mother or father. Hook (2010) has suggested that leave extensions for mothers beyond one year with low levels of pay may reinforce traditional assumptions of motherhood. The extensions of the maximum leave duration in 1988, 1990, 1991, and 1992 therefore may have increased the time mothers spent on child care, even after controlling for mothers' employment status and the length of their labor market interruptions (Hypothesis 5).

The 2007 reform also included an individual leave entitlement for fathers of two months. In combination with the relatively high income-related reimbursement, one objective of this reform was to encourage fathers' participation in child care. Unfortunately, the sample of



fathers who took some parental leave between 2007 and 2009 is too small to allow a separate investigation of the effects of the length of their employment interruptions on their own and their partners' childcare time. I can however examine whether fathers on average spent more time on child care after the 2007 reform, even after controlling for their paid work hours and leave take-up at the time of the interview. This would provide tentative evidence that the reform increased fathers' participation in child care beyond their actual leave taking (*Hypothesis 6*). The hypothesized direct and indirect relationships are summarized in the conceptual model in Figure 1.

[Figure 1 about here]

## **Data and Method**

The data for the analysis are drawn from couple responses in the German Socio-Economic Panel (SOEP) from 1984 to 2009. The SOEP started with a probability sample of households from West-Germany in 1984. It was extended to East-Germany in 1989 and includes also some refresher probability samples from 1998, 2000 and 2006 (for a detailed description, see Wagner, Frick and Schupp 2007). The East German sample and subsamples which oversample individuals with foreign nationalities or high income households are not used in this analysis. A great strength of this longitudinal survey is that all members of the household are interviewed annually. In addition to retrospective fertility and employment histories, the SOEP asked each respondent annually about time spent on child care and paid work.

For investigating the direct and indirect parental leave policy associations with child care time of both partners in a couple, it is important to consider that the time allocations to child care of mothers and fathers and mothers' employment decisions after a birth may be endogenous. They may affect each other and unobserved factors such as work-family orientations or measurement error might affect all of these processes simultaneously. In addition, in countries

such as Germany, where many women exit the labor market for more than one year after childbirth, regression models based on yearly panel data for the sample of women whose labor market return is observed may result in bias if unobserved selection factors in the timing of this return are not considered. To address these issues, I use a multilevel multiprocess model, where a system of regression equations with random coefficients is estimated simultaneously (for a similar approach see e.g., Baxter, Hewitt and Haynes 2008; Steele et al. 2005). The multiprocess model includes two continuous models of women's and men's child care hours, respectively, a piecewise-linear log-hazard duration model of the risk of labor market return in a respective month after the birth, and a continuous model of mothers' work hours in the year of labor market return. The continuous models of child care time follow couples up to four years after a first or second birth. As repeated birth events for the same couple and related changes in paid and unpaid work are not independent, all the models consist of a two-level hierarchical structure where repeated birth observations are considered to be clustered within couples. Previous tests with parity-specific individual fixed effects models suggested that the nature of the effects of parental leave reforms and women's return to work decisions is very similar for first and second births, so treating them as repeated events seemed appropriate. To account for time-constant unobserved factors such as stable work-family orientations or measurement errors which correlate with child care time of both partners and maternal labor market return decisions, couple-specific random coefficients are included in each model and are allowed to correlate between all processes. In another terminology, the system of regressions can be understood as a family fixed effect model for exploring the within-couple variation specifically for women's labor market return decisions and both partners' child care contributions after a birth.

The analysis of parental leave policy associations with child care time focuses on couples with a newborn child. Previous studies have shown that parents are a select group which vary

from childless couples, for instance, in their family orientations and educational qualifications (Henz 2008). The level of selectivity increases with birth order. Couples with a birth between different parental leave reforms in the late 1980s may also be select as a result of the possible anticipation of leave extensions in 1988 and 1990. To control for selection effects as a result of unobserved factors which correlate with the decision to have a(nother) child and women's time allocation to paid and unpaid work, I use three probit models of whether the couple has a first, second or third child, respectively, during the observation period in the panel. To capture unobserved variations in the propensity of couples to become parents and have more children, I include a joint unobserved heterogeneity term in the three probit models which is allowed to correlate with the random intercepts of the other four processes. This is equivalent to a Heckman-type selection correction for nested models. I cannot use hazard models to also account for the timing until the next birth event because the start of the relationship is not known and some second-time parents are not observed at the first birth. All random intercepts are assumed to be normally distributed. The models are estimated simultaneously using the software aML. The results proved robust to re-estimation with Huber-corrected standard errors to correct for possible heteroscedasticity issues.

To reduce the risk of reverse causation, all explanatory and control variables (except age of the children) are measured before the respective outcome variable. All prenatal control variables are measured at least nine months before the birth. Ideally I would like to consider the childcare contributions of both partners before mothers returned to work for the timing and extent of their subsequent labor market return. However, childcare time before mothers' labor market return is not observed for some couples where women return to work within one year. To partially control for this, I include women's prenatal housework share, which is strongly correlated with the postnatal division of child care, in the models of women's labor market return and child care time of mothers and fathers. Despite these precautions and the

explicit consideration of time-constant unobserved characteristics correlated with the outcomes, there still remains a risk of bias due to unobserved time-varying factors such as attitudinal changes or measurement errors which affect the estimates of child care time of men and women.

### *Sample selection*

The sample is restricted to couples, irrespective of marital status, where women are between 20 and 45 years old when they have their first or second child. Unmarried cohabiting couples are included, as childbearing increasingly occurs before a marriage in Germany. A couple is coded as experiencing a birth if the woman is observed having a baby while both partners lived in the same household. Teenage mothers are excluded because the dynamics in their division of labor with partners are likely to be driven by other factors such as education and family networks. Women for whom the birth parity is unknown because of missing fertility histories are excluded. The observed birth is the first or second one for the female partners, but it may not be the same birth order for the male partners. Including a dummy variable for whether the man fathered a child in a previous relationship however does not affect the results. I include couples who have given full interviews before the woman becomes pregnant (calculated as 9 months before the birth date) and at least once after the birth of the child. Based on these restrictions, I observe 1084 first births and 1066 second births in West Germany over the observation period from 1985 to 2009. 595 couples experience both birth events during the panel observation period. These couples provide the information on unobserved characteristics associated with repeated birth events. The comparison group of couples who remain childless over the observation period include 1367 couples with women in the same age range (20-45) who can be observed continuously for at least two waves. Of the couples with two children, 347 German couples go on to have a third child during the observation period.

### *Non-response*

In order to maximize the number of observed births, an unbalanced panel of up to four years after a first or second birth is used. I have investigated the potential of bias due to wave non-response by examining the correlation with all main explanatory variables and found a low rate of wave non-response among couples with young children. I also compared the analysis sample with couples who joined the panels after the start of the respective pregnancy. Women with lower education are more likely to start cohabiting only after the start of pregnancy and therefore the sample probably slightly under-represents the less well educated. To reduce the risk of bias as a result of attrition between the first and the fourth year after the birth, correlates of non-response such as home ownership, poor health of either partner, and interviewer changes are included in all models in addition to the other control variables.

Of all observed birth events, 411 include some non-response in one of the dependent variables. The questions with the largest amount of missing information are child care hours of men. For missing information on earnings, I use the imputed information from the cross-national equivalent files of the SOEP. For all other control variables, dummy variables are included to flag missing items in each variable. The final sample size is 1736 birth events experienced by 1299 couples.

### *Measures and descriptive statistics*

The two key dependent variables in this analysis are childcare hours of men and women. Every year the SOEP has asked male and female respondents in households with dependent children to provide estimates of how many hours they spend on child care on a typical weekday. Weekend estimates were not asked every year and are therefore excluded in this longitudinal design. Retrospective survey questions of household activities are generally more prone to overreporting compared to primary activities measured by time diaries (Kan and

Gershuny 2008). They also do not allow a distinction between primary and secondary activities and overall time spent with children. Some of the overreporting may however capture time spent organizing activities and care for children when the child was not present, which can also be subsumed under child care. The effect of women's work hours on their own/partners' childcare time may be overestimated if women and their partners compensate for women's longer work hours and fewer child care hours on a weekday by doing more/less child care on weekends. To test this, I examined differences in weekend child care hours between couples where mothers return to work full-time and those who return part-time for the years where weekend data was available. I found that women who return to work part-time do more and their partners less child care on the weekend compared to couples where mothers work full-time. This suggests a very limited risk of bias.

The labor market return decisions of mothers are captured in two variables. The duration of women's labor market interruption after a birth is measured as the number of consecutive months after the birth of the child which a woman records her labor force status as either on maternity/parental leave or as looking after the family until she experiences her first spell back in employment or education. The labor market interruption measure therefore captures the time mothers spend away from paid work or education. The length of labor market interruption is not used to refer to actual take-up of maternity or parental leave entitlements because parents in Germany are permitted to combine leave with part-time work. The second variable measures women's total weekly work hours in the year after they re-entered the labor market.

Descriptive statistics for the dependent variables are shown in Table 1. In the four years following a first or second birth, mothers and fathers in West Germany spent on average 10 and 2 hours, respectively, on child care on a typical weekday. These relatively high estimates

of weekday child care hours by female and male respondents suggest that most people considered in their responses primary and secondary child care and possibly also time spent on other activities with children present. Women's child care share relative to the couple's total was 81 per cent. 58 percent of German mothers returned to the labor market or education within 4 years after the birth. The average length of the labor market interruption was 21 months. Mother worked on average 15 hours per week in the year of their return.

[Table 1 about here]

To capture variations in the period for which leave was available, I construct a continuous variable of the number of months of low-paid or unpaid leave available to a mother at the time of the respective childbirth. Tests with dummy variables for each reform gave qualitatively similar results but were less significant because the short time between some modifications in the leave period resulted in small samples. To capture variations in the benefit levels, duration of paid leave, and increased flexibility in take-up after the reforms in 1998, 2001, and 2007, I construct indicators for whether the child was born during each respective reform period. Furthermore, I include a dummy variable for the period before 1986 when the maximum leave period was shorter than one year to allow for potential non-linear effects of parental leave entitlements. The maximum length of leave available and the period dummies can vary between different parities for the same mother if a policy change took place between the first and second birth. I also tested a variable measuring only the maximum number of months of paid leave but the length of total leave in combination with the reform indicators showed a better fit with the data. To distinguish associations with parental leave policy changes from cohort trends, I include a continuous measure of the mother's year of birth.

I include a control variable for whether the youngest child attends publicly subsidized daycare in the respective year. Unfortunately information on help with childcare from relatives or

privately funded care-givers is available only from 1997 onwards. I also reran the models with a control variable for regional variation in publicly subsidized day-care places for children under the age of three over the period from 1990 to 2002, which gave qualitatively the same results for the observed reforms. The results were also unaffected by including the annual unemployment rate for West-Germany in all the models.

Fathers' work hours are controlled as previous studies found men's long market hours to decrease their own contributions to unpaid work and to increase their partners' (Cooke 2007; Hook 2010). To test whether associations of fathers' eligibility to leave with child care time are mediated by their actual take-up of parental leave, I include a control variable for whether the father was on leave at the time of the interview. Women's prenatal hourly wage rate is used as a measure of opportunity costs and their ability to outsource childcare to the market. Men's prenatal hourly gross earnings are included as a measure of men's economic resources. All earnings variables are measured in Euros and adjusted for inflation with base year 2000. I also tested a categorical variable for mothers' relative prenatal wage rate but found no significant associations with child care time in couples. Furthermore, a control variable for women's prenatal housework share is included in all models.

I differentiate between three levels of educational attainment for women and men: university degree, high school degree, and less than high school. I control for women's age at birth and marital status before the pregnancy because couples that become parents at an older age or are unmarried may have a less traditional division of child care. To account for the amount of child care required, I include the age of the youngest child in months and the number of children in the household. In the childbearing selection models, I consider lagged variables of age, education, and earnings of both partners, marital status, age of the youngest child and women's housework share.



## Results

### *Analytical strategy*

The system of regressions described in (1) to (7) below was estimated simultaneously. It includes two continuous models of child care hours of women (1) and men (2) over 4 years after childbirth, a piecewise-linear log-hazard duration model of the risk of labor market return (3), a continuous model of women's work hours upon their return to the labor market (4) and three probit models with a joint random intercept for whether the couples has birth 1, 2, or 3 (see regressions 5, 6, and 7).  $\alpha$  denotes the couple-specific random intercept of the respective model. Fixed unobserved characteristics associated with time allocation to paid work by mothers and to child care by both partners and selection into childbearing are controlled by allowing the five random intercepts to correlate.

Starting from baseline models with control variables, a variable for the maximum number of months of leave ( $L$ ) and a vector of reform indicators for other leave policy changes ( $R$ ) are included in the models of women's child care hours ( $C^w$ ), men's child care ( $C^m$ ), mothers' risk of labor market return ( $\ln h(t)$ ) and their hours in paid work ( $P$ ).

To test Hypotheses 1 to 6, I add an interaction term between whether the woman is still out of work ( $N$ ) and the time since childbirth which she has spent out of work ( $I$ ), a continuous variable of women's paid work hours ( $P$ ), and two binary variables whether the woman returned to education ( $E$ ) or has not returned yet ( $N$ ) to the child care models. The interaction term is needed as I expect longer interruptions to increase mothers' child care time while the woman is out of work but not after she returned to the labor market. After the return, her hours in formal employment are assumed to be more influential for the time she and her partner allocate to child care.  $X$  denotes a vector of control variables included in all models. Log likelihood tests of nested models comparing the baseline model of control variables with 1) models which include parental leave policy variables, and 2) also indicators for the timing and extent of mothers' labor market return suggest in each case a significantly improved fit.

$$C^w = b_1^w + b_2^w I \times N + b_3^w N + b_4^w P + b_5^w E + b_6^w L + b_7^w R + b_8^w X + \alpha^w \quad (1)$$

$$C^m = b_1^m + b_2^m I \times N + b_3^m N + b_4^m P + b_5^m E + b_6^m L + b_7^m R + b_8^m X + \alpha^m \quad (2)$$

$$\ln h(t)^i = b_1^i + b_2^i L + b_3^i R + b_4^i X + \alpha^i \quad (3)$$

$$P = b_1^p + b_2^p L + b_3^p R + b_4^p X + \alpha^p \quad (4)$$

$$\Pr(B1 = 1) = b_1^{b1} + b_2^{b1} X + \alpha^b \quad (5)$$

$$\Pr(B2 = 1) = b_1^{b2} + b_2^{b2} X + \alpha^b \quad (6)$$

$$\Pr(B3 = 1) = b_1^{b3} + b_2^{b3} X + \alpha^b \quad (7)$$

*Parental leave reforms, maternal labor market return, and child care time*

As shown in Table 2, extensions of low-paid or unpaid parental leave beyond the first year after childbirth significantly delayed mothers' labor market return. A one-year extension was associated with a reduction of mothers' risk of labor market return by one third in each respective month. There is no evidence of a significant change in the speed of mothers' labor market return after the introduction of greater flexibility in take-up and benefits in 1998 and 2001. After the reduction of the maximum duration of paid leave from 24 to 12 months in 2007 in combination with the introduction of an income-related reimbursement, mothers were three times more likely to return to work in every respective month. The hours mothers worked after their labor market return were unaffected by all but the most recent parental leave reform in 2007. The latter was associated with an increase in the volume of mothers' labor market participation by about 6 hours per week.

[Table 2 about here]

As shown in Figure 2, mothers seem to spend more time on child care with increasing duration of their labor market interruption. This is consonant with Hypothesis 1. Over the course of a one-year work interruption mothers' child care time increases in total by 30

minutes on a weekday holding the age of child and all other controls constant. Interestingly, a longer labor market interruption by one year for mothers is also associated with an increase in fathers' child care involvement, but only by 7 minutes per weekday. This result points to some degree of complementarity of maternal and paternal child care time. The effect of an additional month of labor market interruption for mothers is however more than four times as large for mothers' care time than for fathers' child care involvement on weekdays. Longer maternal employment interruptions therefore still reinforce a traditional gender division of child care. I also tested whether the associations with the length of women's labor market interruption plays a role after women's labor market return but found no significant interaction effect (not shown). This suggests that women with longer work interruptions neither continue to increase their child care time more after labor market re-entry nor do they reduce their child care time more when back at work.

The significant associations of women's work hours with their own and their partners' childcare time provide support for Hypothesis 2. An increase in mothers' work hours by 15 hours per week - one standard deviation - after their labor market return reduces their own child care time by about 1 hour and 20 minutes and increases their partners' child care time by 28 minutes on a weekday. In addition, fathers spend 24 minutes more on child care on a weekday when their partners are currently working for pay. At an average duration of 21 months for mothers' work interruptions, mothers' employment therefore raises fathers' childcare time, even if mothers only work for pay for one hour per week.

[Figure 2 about here]

Hypothesis 3 assumed that variations in the length of parental leave available to mothers in the late 1980s and early 1990s indirectly affected the time mothers and fathers spent on child care by influencing mothers' timing of labor market return. In combination, the results

discussed above provide support for an indirect positive effect of long (low-paid or unpaid) leave on mothers' child care time through a delay in mothers' labor market return. For average durations of mothers' work interruptions, the indirect effect on fathers' childcare time was negative.

In line with Hypothesis 4, the introduction of shorter well-paid leave in 2007 indirectly reduced mothers' child care time. This reform raised not just the likelihood of mothers' labor market participation after the birth but also their hours upon return. The 2007 reform was therefore also indirectly associated with an increase in paternal care.

#### *Direct associations of parental leave policies with child care time*

According to Hypothesis 5, parental leave policy reforms may also impact on mothers' and fathers' child care time more directly, for instance, through changes in gender and parenting ideologies. Even after including measures for the actual length of mothers' work interruption and the volume of participation upon return, the association of the period of leave available remained positive and statistically significant in the model of maternal child care time (see Table 2). This provides tentative evidence that long leave durations at low levels of pay may increase mothers' child care time even after controlling for indirect effects through maternal employment.

For fathers, the 2007 reform was directly associated with an increase in child care time in line with Hypothesis 6. Fathers report being more involved in child care since this reform, even after accounting for fathers' work hours, for whether fathers were currently on leave at the time of the interview and for mothers' faster labor market return and their increased work hours upon return since 2007.

Figure 3 illustrates the strength of the direct and indirect associations of parental leave reforms with child care time of mothers and fathers. Only the statistically significant associations are shown. The direct associations are based on the results in Table 2. The indirect associations are calculated by deducting the direct association from the associations in a model which does not consider the individual level effects of maternal labor market return behavior on maternal and paternal child care time (the detailed results of this model are available from the author on request). The indirect associations of a one-year extension of low-paid or unpaid leave in the late 1980s and early 1990s with mothers' and fathers' child care time were relatively small, increasing child care time at most by 8 minutes for mothers and decreasing paternal care time by only about 3 minutes per weekday. The direct positive association with maternal care time was much larger. The 2007 reform appears to have had sizable direct and indirect effects on child care time in couples. Mothers' faster return and longer work hours after the reform reduced their child care time by 34 minutes and increased paternal care time by 17 minutes. In addition, the 2007 reform was also directly associated with a rise in paternal care time by 23 minutes on a weekday. The size of the direct policy associations with retrospective reports of maternal and paternal care time should be taken with a grain of salt, as the leave policy effects may be overestimated if these policies affected parenting values as well as actual practice and resulted in time-variant measurement error in the child care variables.

[Figure 3 about here]

#### *Unobserved heterogeneity and control variables*

The couple-specific random intercepts, denoted by  $\alpha$  are statistically significant in all five parts of the multilevel multiprocess model. Correlation coefficients for the unobserved heterogeneity terms are shown in Table 3. The strong positive correlation of unobserved heterogeneity in child care time of women and men in couples provides more evidence of

complementarity in couples' child care. Not surprisingly, mothers who return to the labor market faster after childbirth also have a higher propensity to work longer hours upon their return. After considering mothers' labor market participation decisions in the models of maternal and paternal care time after the birth, the previously strongly significant correlations between the unobserved heterogeneity terms of the speed and extent of mothers' labor market return and maternal and paternal child care time, respectively, ceased to be significant. This provides support for a relatively direct relationship between mothers' labor market return and couples' child care time after a birth. Unobserved selection factors which increase the likelihood of couples having another child seem to reduce mothers' and fathers' child care time, the probability of mothers' labor market return and mothers' work hours after a return.

The estimates of parental leave policy effects on maternal labor market return and maternal and paternal care time are smaller after accounting for fixed unobserved heterogeneity between these processes. Whereas the effects of maternal labor market return on child care time of mothers and fathers vary only slightly, significant differences can also be seen for some control variables such as the number of children, whether fathers were on leave, fathers' education and paid work hours (results are available from the author on request).

The results for control variables in the models of mothers' likelihood of labor market return, hours in formal employment, child care time of both partners and probability of having a first, second and third child are generally consonant with previous studies (estimation results are available from the author on request). Due to space limitations, I summarize only the covariates of the child care models. Men's higher levels of education and earnings are positively associated with women's child care time, whereas men's education and hours in paid work are negatively associated with their own child care involvement. Both parents

spend less time on child care as the youngest child grows older. Fathers perform more child care on weekdays in couples with a more equal division of housework before the birth.

## **Discussion**

This research provides new evidence on how parental leave policies may influence the division of child care in couples with young children. By observing eight parental leave reforms in Germany since the 1980s, I have explored how variations in leave length, benefit levels and flexibility in take-up were associated with child care time of mother and fathers, either directly or indirectly through the timing and extent of mothers' labor market return.

My findings of delays in maternal labor market return as a result of extensions of low-paid or unpaid parental leave beyond the first year after childbirth are consonant with previous studies from Germany and other countries (e.g., Ondrich, Spiess and Yang 1996; Ondrich et al. 2003; Pronzato 2009). In this study I connect these results with a detailed investigation of how the length of mothers' labor market interruption and the volume of participation upon return influence mothers' own and their partners' child care time. I show that *ceteris paribus* longer periods of labor market interruption for mothers increased their own and their partners' child care time. The stronger positive effect on maternal care time resulted in a more and more traditional division of child care with longer durations of mothers' time-out.

Small optional increases in the benefit level for a shorter period and incentives for longer part-time hours or simultaneous leave of both parents in 1998 and 2001, respectively, had no significant impact on mothers' labor market return decisions and child care time in couples. However, I found a larger indirect negative effect on maternal care time and a positive effect on paternal child care involvement of the 2007 reform which shortened the period of paid leave to 12 months, introduced income-related compensation and two months of individual

leave entitlement for each parent. The effects of this reform on the division of child care in couples were stronger because it raised not only the probability of mothers' labor market return but also mothers' work hours. Mothers' increased employment hours upon labor market re-entry after the 2007 reform reduced their own child care time and also raised fathers' child care time on weekdays. This positive association of women's employment hours with fathers' absolute levels of child care involvement is consonant with time use studies for the US, Australia, Denmark, Italy, France, and Sweden (Craig and Mullan 2011; O'Connell 1993; Sullivan et al. 2009), whereas a linear association was not found in American, British and Norwegian couples (Bryant and Zick 1996; Sullivan et al. 2009; Yeung et al. 2001). My results also contrast with a study by Cooke (2007), who finds no significant relationship between women's work hours and their husbands' contributions to child care in married couples in Germany in the 1990s. One explanation may be that the influence of mothers' work hours on paternal child care involvement is stronger among unmarried cohabiting couples.

Even after accounting for indirect parental leave policy effects on mothers' labor market return, extensions of low-paid or unpaid leave beyond one year were associated with longer maternal care time during the years following a birth. Furthermore, the 2007 reform appears to have increased fathers' child care time in West-Germany even after controlling for their own take-up of leave, their paid work hours and for indirect effects through changes in their partners' timing and extent of labor market return. These results are in line with the broad associations with family friendly policies found by previous studies on child care time based on repeated cross-sections of several countries (Craig and Mullan 2010; 2011; Hook 2006). My research extends these by exploring more in detail the direct and indirect pathways how parental leave policies may influence maternal and paternal care time after a birth. The finding of direct associations of parental leave policies with child care in couples provides an



interesting contrast with a recent study on housework, which found no evidence of direct parental leave policy associations with housework time in British and German couples with young children (Schober 2011). This suggests that parental leave policies are more likely to influence conceptions of motherhood and fatherhood than gender ideologies relating to the division of unpaid work in general.

By observing different types of parental leave reforms, this research also suggests that the details of the parental leave policy package matters. Whereas mostly positive effects on mothers' longer-term labor force participation and retention rates have been found for paid parental leave during the first year after childbirth (e.g., Ruhm 1998; Waldfogel, Higuchi and Abe 1999), longer parental leave periods with low or no pay promote a traditional division of paid and unpaid work in couples. This finding is of relevance for a large number of European countries which currently offer parents leave periods of three years or more after childbirth but mostly with relatively low levels of pay. Eligibility of father to leave from 1986 and permission of simultaneous leave for both parents in 2001 did not seem to make a difference for the time fathers spent on child care, as long as this was combined with low benefit levels. In line with Scandinavian studies (e.g., Brandth and Kvande 2001; Pylkkaenen and Smith 2004), only when the individual entitlement with a high income replacement rate was introduced in 2007, German fathers' take-up of leave increased. My results suggest that this also led to greater paternal child care involvement beyond the period of leave.

An important limitation of this study is the measure of child care time through retrospective survey questions rather than time diaries. As respondents' estimates of weekday child care time may be influenced by their gender ideologies and parenting attitudes, there is a risk that associations of child care time with policy reforms are overestimated if these policies affected norms and values more strongly than actual practice. I account for couple-specific fixed

unobserved heterogeneity for repeated birth events and estimate the time both partners in a couple spend on child care simultaneously with correlated error terms. This reduces the risk of bias due to measurement errors in the child care time estimates which correlate either with stable individual-specific beliefs about child care or with family myths about the division of child care which are shared by mothers and fathers in a couple. In line with such arguments, I found evidence of fixed common unobserved influences on the amount of time both partners in a couple spend on child care. By accounting for unobserved selection factors into childbearing, the multilevel multiprocess models also reduce the risk of bias in the policy effects identified on maternal labor market return and child care time that might arise otherwise from the focus on the subsample of couples who had a first or second child.

I have argued that changes in parental leave policies have been important developments in German family policy over the last decades. There remains a risk of bias due to time-variant unobserved factors, such as changes in the social and economic context other than parental leave policies. To reduce this risk, I controlled for use of formal day-care for the youngest child and carried out additional tests with temporal and regional variations in day-care availability and unemployment rates. To ascertain the generalizability of these findings, evidence on parental leave reforms and child care time in other countries is needed. Promising extensions for future research also include examinations of other relevant institutional changes in formal child care provision or working time policies and their impact on unpaid work and associated gender or parenting values. Considering normative changes alongside potential policy effects on behavior would help to disentangle to what extent policy reforms facilitated behavior in line with pre-existing attitudes or actively encouraged value change.

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Table 1: Descriptive statistics for couples in West-Germany pooled for 4 years after a first or second birth

	Mean/ Percent	SD
Women's child care hours on weekday	10.17	5.77
Men's child care hours on weekday	2.12	2.20
Women's share of child care of couple	81.00	15.71
% Women who returned to work 4 years after birth	57.81	
Length of labor market/education interruption in months	21.03	12.91
Weekly hours worked in year of labor market return	14.53	14.47
Low education	18.72	
Medium education	58.48	
High education	22.80	
Woman's prenatal wage	6.72	10.20
Partner low education	17.23	
Partner medium education	59.60	
Partner high education	23.16	
Partners' gross hourly earnings before pregnancy	13.60	13.19
Partners' work hours	40.58	13.60
Max. leave in months	31.57	9.28
Before 1986 (6M low-paid)	3.43	
1986/87 (12M low-paid)	5.45	
1988/89 (14M low-paid)	5.26	
1990 (17M low-paid))	3.29	
1991 (20M low-paid)	4.08	
1992-1997 (36M total, 24M low-paid)	27.49	
1998-2000 (36M total, 12-24M paid, higher benefit option)	16.56	
2001-2006 (36M total, 12-24M paid, higher benefit option plus flexibility)	29.74	
From 2007 (36M total, 12M with income related reimbursement, 2 daddy months)	4.70	
Prenatal housework share of woman	78.72	21.98
Married before birth	80.94	
Age of mother at birth	28.61	4.49
Number of children	1.55	0.55
Age of youngest child in years	1.69	1.11
Birth cohort	1967.98	6.71
Accommodation owned	37.18	
Either partner dissatisfied with health	7.28	
Interviewer change	12.99	
N couples	1299	
N birth events	1736	
N couple years	5530	

Source: Author calculation based on SOEP 1984-2009.



Table 2: Multilevel multiprocess models of weekday child care hours of mothers and fathers in couples, a piecewise linear log-hazard model of maternal labor market return, and a model of mothers' work hours up to 4 years after a first or second birth

	Child care hours of mothers		Child care hours of fathers		Likelihood of mothers' labor market return		Mothers' work hours after return	
	b	SE	b	SE	b	SE	b	SE
Parental leave policy indicators:								
Max. no. total leave in months	0.05 **	0.02	-0.001	-0.002	-0.03 ***	0.01	0.093	0.13
Before 1986	-0.61	1.16	-0.33	0.47	1.2 *	0.5	-7.75	-7.56
1986-1997	-0.29	0.77	-0.37	0.32	-1.2 **	0.39	-4.84	5.21
1998-2000	-0.11	0.64	-0.31	0.25	-1.10 **	0.30	-7.73 *	3.78
2001-2006	-0.52	0.51	-0.38 *	0.16	-1.17 ***	0.23	-5.65 *	2.51
2007-2009 –omitted								
Couple-level variables:								
Interruption length x mother not returned yet	0.04 **	0.01	0.01 *	0.004				
Mother not returned yet	-0.87	0.55	-0.39 *	0.2				
Mother's work hours after return	-0.09 **	0.02	0.03 **	0.01				
Mother returned to education	-0.49	0.40	0.09	0.15				
Father on leave	-1.55	-0.80	2.52 ***	-0.14				
Father's paid work hours	0.004	0.005	-0.05 ***	0.002	-0.001	0.003	-0.02	-0.04
No. children	0.31	-0.19	0.005	0.08	0.20 *	0.10	-5.04 ***	1.29
Age of youngest child in years	-0.62 **	-0.15	-0.13 *	0.05	0.08 **	0.03	0.65	1.90
Year of birth of woman	0.09	0.05	0.03	0.02	0.06 *	0.03	-0.11	0.39
$\alpha$	3.65 ***	-0.10	1.17 ***	-0.02	0.60 ***	0.08	8.98 ***	1.08
Log Likelihood	-43831.1							

Source: Author calculations based on SOEP 1984-2009.

Note: The four models and a probit model of selection into childbearing are jointly estimated in a multilevel multiprocess framework. Birth events are nested within couples and the couple-specific unobserved heterogeneity terms  $\alpha$  of all five processes are allowed to correlate. The multilevel multiprocess model is estimated using full information maximum likelihood. All parts of the model include additional control variables for marital status, women's age at birth, both partners' education and prenatal wages, women's prenatal housework share, whether the youngest child attends formal day-care, and attrition predictors.

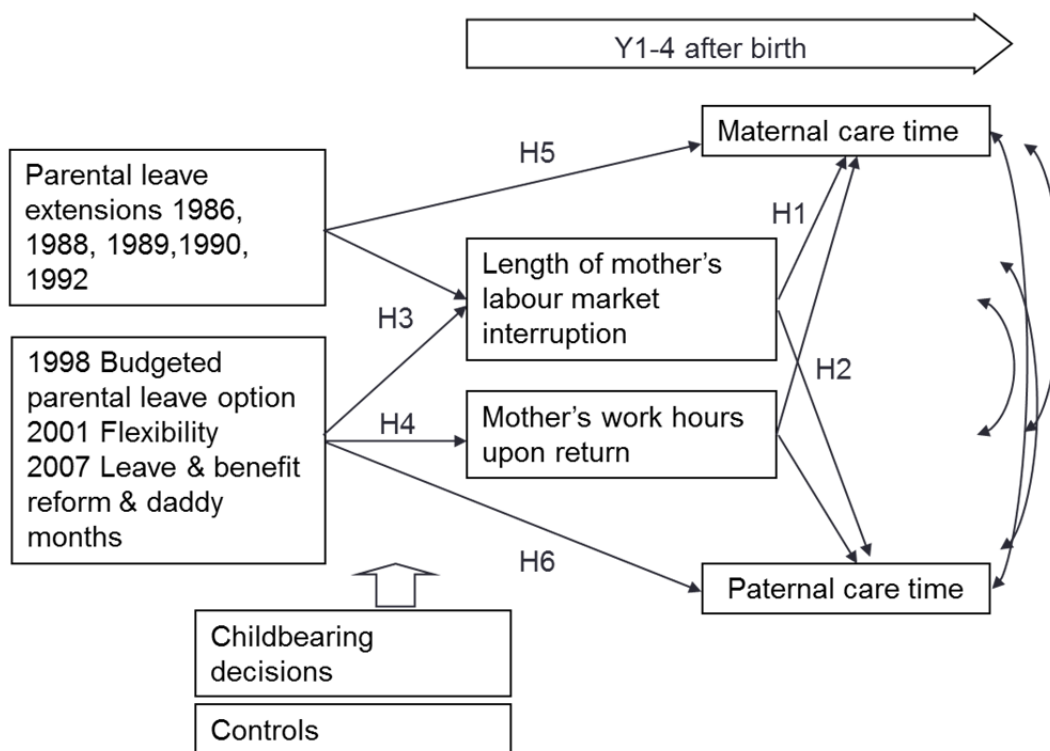
\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$  (two-tailed tests).

Table 3: Correlation coefficients of estimated couple-specific unobserved heterogeneity terms

	Mothers' child care hours	Fathers' child care hours	Hazard of mothers' labor market return	Mothers' work hours
Mothers' child care hours	1			
Fathers' child care hours	0.32 ***	1		
Hazard of mothers' labor market return	-0.04	0.03	1	
Mothers' work hours	-0.02	-0.08	0.51 ***	1
Odds of having another child	-0.10 ***	-0.21 ***	-0.48 ***	0.15 ***

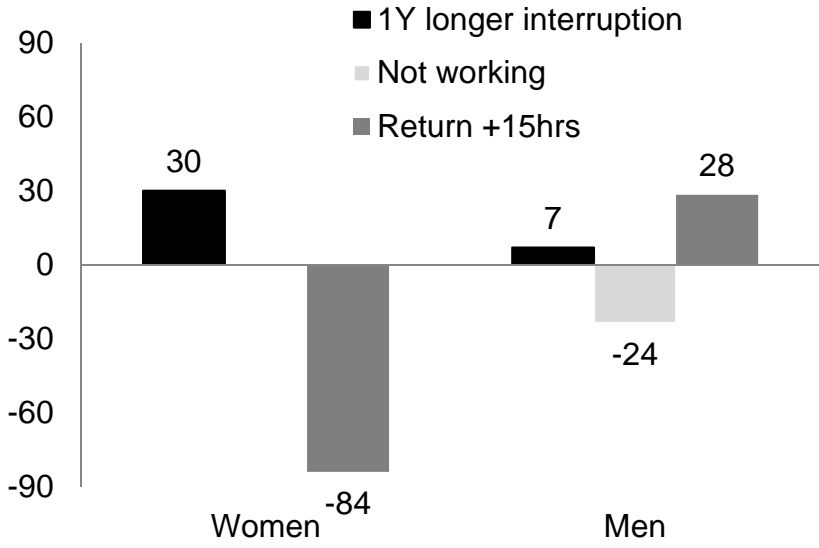
Source: Multilevel multiprocess models of the five processes based on SOEP 1984-2009.

Figure 1: Conceptual model of parental leave policy effects on maternal and paternal care time and summary of hypotheses



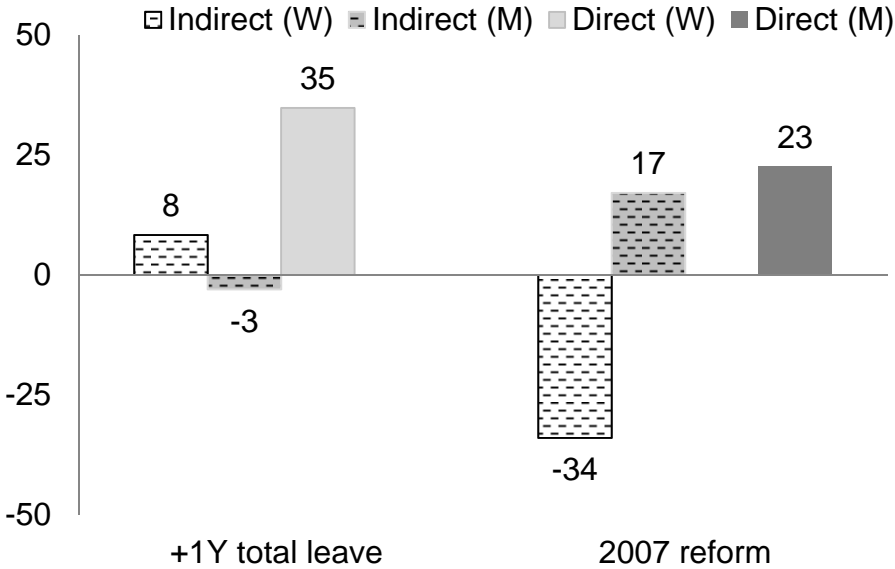
Note: The straight arrows and H1 to H6 indicate the hypothesized relationships. The bent arrows indicate that error terms between these processes are freely estimated.

Figure 2: Effects of mothers' labor market return on weekday child care minutes of mothers and fathers



Source: Author calculation based on SOEP 1984-2009.  
 Note: Only statistically significant associations are shown.

Figure 3: Direct and indirect effects of parental leave reforms on weekday child care minutes of women and men in couples



Source: Author calculation based on SOEP 1984-2009.  
 Note: Only statistically significant associations are shown.