Genus

ORIGINAL ARTICLE Open Access

Who is affected by parental leave reforms? Women's selection into different parental leave lengths across recent policy reforms in Germany

Lara Bister[1,2,3*], Peter Eibich[4] and Roberta Rutigliano[5,6]

*Correspondence:
lara.bister@unibocconi.it

[1] Population Research Centre, Faculty of Spatial Sciences, University of Groningen, Groningen, The Netherlands
[2] Max Planck-University of Helsinki Center for Social Inequalities in Population Health (MaxHel), University of Helsinki, Helsinki, Finland
[3] Dondena Center for Research on Social Dynamics and Public Policy, University Bocconi, Milan, Italy
[4] Université Paris Dauphine, LEDa-LEGOS, Paris, France
[5] Department of Sociology and Social Work, University of the Basque Country (UPV/EHU), Bilbao, Spain
[6] Research Group on Social Determinants of Health and Demographic Change—OPIK, Leioa, Spain

Abstract

Public parental leave schemes aim to facilitate women's reconciliation of family and employment after their transition into motherhood. While parental leave policies underwent several reforms over the past decades, adapting to changing female labour market participation and family cultures, the available entitlements are not tailored to women's individual circumstances and needs. It remains unclear how these affect the women's parental leave uptake, particularly the leave length. In this paper, we followed an exploratory and descriptive approach to study the selection of women into different parental leave lengths with changing public parental leave entitlements in Germany and according to their individual characteristics. We use data from the German Statutory Pension Fund on 29,001 women born between 1955 and 1984 who had their first child between 1991 and 2016 at the ages 20–39. We estimate linear regression and discrete-time proportional hazard models to examine associations between women's characteristics and their length of leave. We identify the effects of two major parental leave reforms in Germany in 1992 and 2007 in a Regression Discontinuity Design. Our results show that the general extension of available parental leave entitlements in 1992 increased the likelihood of women's parental leave uptake between 25 and 36 months. For women who became mothers at an older age, had a high income before transitioning into motherhood, or with higher education; however, the likelihood of parental leave uptake of 2 months increased. The reform of 2007 led to an increased likelihood of leave uptake longer than 2 months for these women. These findings suggest that women with a higher labour market attachment have responded more strongly to the changes in parental leave benefits in Germany.

Introduction

Public parental leave schemes represent a family policy tool that enables women to reconcile family and employment after transitioning into motherhood (for example, Hewitt et al., 2017). Previous research shows that women's parental leave uptake positively affects their post-partum distress levels (Brugiavini et al., 2013). Therefore, parental leave legislation aims to protect women's health and stimulate their labour market attachment after their transition into motherhood (ILO 2011; Low &

Sánchez-Marcos, 2015). However, the normative component of women's parental leave uptake likely varies with the legal framework, the cultural context, and women's characteristics, as well as the interplay between these three dimensions (Gangl & Ziefle, 2015; Gauthier, 2002, 2011).

Compared to the extensive literature on women's general parental leave use, research on the determinants of women's realised parental leave length is limited. Existing studies show that gender norms at the societal level and practised gender ideologies at the individual level might impact women's realised parental leave lengths. Precisely, higher levels of gender equality likely correspond to shorter parental leaves (Barnes, 2014; Morgenroth & Heilman, 2017), while the opposite was found for lower levels of gender equality. For instance, family policies, which reinforce traditional gender roles, usually promote extended parental leave periods for women but only among a more selected and advantaged group of women (cf. Lapuerta et al., 2011). However, from a gender-egalitarian perspective, the availability of an extended parental leave period for women, i.e., translating into a more extensive recovery period after the transition into motherhood and familiarisation period for the reconciliation of family and employment, is essential for preventing adverse health and labour market trajectories for women after the transition into motherhood and—at the same time—long-term gender inequality on the labour market. It is, therefore, expected to precede high levels of (full-time) work resumption after the leave period.

The implementation of parental leave policies is essential to change society's individual and normative attitudes towards women aiming to reconcile family and employment. Research on the role of family policy finds that parental leave regulations and public childcare supply enable women to expand their parental leaves (Ondrich et al., 2003). In particular, more generous parental leave schemes, including extended job protection periods and financial benefits, allow more vulnerable women, for example, those of a lower socioeconomic status or poor health, to take parental leaves that meet their specific needs after transitioning into motherhood. Such generous leave schemes might, in turn, promote women's work resumption and eventually improve their maternal health in the long run (Bister et al., 2023; Guertzgen & Hank, 2018; Lapuerta et al., 2011). Although the impact of a prevailing parental leave policy on women's parental leave uptake and length realised has been considered in prior studies investigating women's long-term health and labour market attachment (cf. Bister et al., 2023; Guertzgen & Hank, 2018; Low & Sánchez-Marcos, 2015), the role of parental leave policy reforms on the actual selection of women into different parental leave lengths has not been researched.

We aim to fill this gap by exploring the impact of parental leave policy schemes on women's selection into parental leave lengths in Germany.

Thereby, we present an exploratory and descriptive study of the impact of two reforms on the length of parental leave according to women's characteristics. Exploiting the German context for our study has several advantages. The female labour force participation in Germany has increased in recent decades to approximately 70%, but almost 40% consists of women working part-time (OECD, 2019). At the same time, the persistence of conservative family norms and adherent policies promoting the male-breadwinner model (Gottschall & Bird, 2003), jointly with the prevalent intensive mothering ideology (Borck, 2014; Collins, 2021; Diabaté & Beringer, 2018), makes

Germany an interesting case study. Shifts in German family policy during the past decades have, however, aimed to increase women's work resumption after transitioning into motherhood by extending the available job-protected parental leave period and financial benefits and incorporating fathers in the available parental leave benefits. Nevertheless, there is substantial variation in women's realised length of parental leave in Germany, which likely concerns women's individual needs when reconciling family and employment. Women of varying labour market attachment or health might respond differently to anticipating a motherhood penalty (Mari & Cutuli, 2021) or experiencing social role pressure (Ennis, 2014). Both might affect the realised length of their parental leave uptake.

With our study, we aim to address this research gap and contribute to the literature by showing how different parental leave entitlements and changes in these through substantial reforms affect the selection of women of varying maternal ages, education, income, and health in parental leave lengths after they become first-time mothers, drawing on rich administrative German data enabling the analysis of two major parental leave reforms in Germany in 1992 and 2007.

Theoretical background

Previous empirical findings

There is robust evidence about the potential positive effects of parental leave policies on different outcomes in women and their children, such as children's development (Andres et al., 2016; Waldfogel, 2001) and women's mental health (Courtin et al., 2022) or work resumption after transitioning into motherhood (Pronzato, 2009). Parental leave legislation mediates the relationship between women's employment attitudes and the labour market requirements. However, understanding each factor's specific role in women's parental leave uptake is crucial for disentangling parental leave policies' impact on women's parental leave uptake (Brugiavini et al., 2013). While the consequences of public parental policies on women's return to the labour market have been well researched (cf. Burgess et al., 2008; Gangl & Ziefle, 2015; Kluve & Tamm, 2013; Schönberg & Ludsteck, 2014), little is known about how parental leave policies affect the variation in women's realised parental leave length.

The few studies available suggest that particularly gender and family norms, both at the individual and the societal level, determine the realised length of women's parental leave.

First, individuals gendered social roles, family norms, and family structures might explain women's labour market attachment after transitioning into motherhood. Respective studies found that women who developed more egalitarian values at a younger age (Thornton et al., 1983) or who grow up with working mothers as potential role models (Burt & Scott, 2002) tend to be more attached to the labour market in the first place, more likely return to their work after transitioning into motherhood in general, and take comparatively short parental leave (Barnes, 2014; Desai & Waite, 1991). However, these studies disregard variations in gender role and family norms across different societies.

Second, societal-level gender and family norms, particularly the prevailing level of gender egalitarianism, provide an additional explanation for women's realised parental

leave lengths (Hsiao, 2023; Olsson et al., 2023). Literature shows that societal norms on the maternal role might moderate the impact of public parental leave policies on women's leave uptake and work resumption, emphasising the role of women's compliance with gendered mothering norms such as the 'good mother' and their perception of this normative behaviour (Morgenroth & Heilman, 2017). In other words, in less egalitarian family-cultural contexts, i.e., contexts that reinforce traditional gender roles and force women into the role of the primary caretaker for their children (Lapuerta et al., 2011), women are more likely to leave their employment after transitioning into motherhood (Gottschall & Bird, 2003), particularly among more disadvantaged groups (Lapuerta et al., 2011). The opposite is likely true for more egalitarian family cultures, such as Sweden (Duvander & Cedstrand, 2022).

Thereby, women's health before transitioning into motherhood is a relevant expression of disadvantage and a significant selection mechanism for different parental leave lengths (Aitken et al., 2015). Some studies indicated a negative health selection in parental leave lengths in more fragile women, but that this mechanism also improves these women's labour market attachment (Bister et al., 2023; Guertzgen & Hank, 2018). In line with these findings, some studies indicated that extended parental leaves (both available and realised) decrease maternal distress after transitioning into motherhood and improve mental health (Courtin et al., 2022; Heshmati et al., 2023; Hewitt et al., 2017).

The German context represents an interesting case as it is considered a traditional country regarding family and parental leave policies (Gottschall & Bird, 2003). Women's education expansion, followed by a massive return of women into the labour market, was not followed by a timely reform of the parental leave policy, pushing women, significantly less educated ones, out of the labour market (Konietzka & Kreyenfeld, 2010; Kuhlenkasper & Kauermann, 2010). Specifically, parental leave expansions have been found to lead to a short-term increase in women's work attachment, i.e., a higher share of women returned to work immediately after these reforms (Schönberg & Ludsteck, 2014). However, in the long run, the impact of such reforms was considerably smaller (Schönberg & Ludsteck, 2014).

Parental leave entitlements and policy reforms in Germany

The current parental leave legislation in Germany consists of two pillars: the leave period and the financial benefits during the leave. For the analysis period considered in this paper, all entitlements are linked to a specific period of the parental leave and vary along the recent parental leave policy periods in Germany before and after the reforms of 1992 and 2007 (see Table 1).

First, the entitled parental leave period: The parental leave period defined in the German legislation consists of a statutory leave period, the maternity leave (in German: "Mutterschutz"), and a consecutive optional leave period, the parental leave (in German: "Elternzeit"). Statutory maternity leave is exclusively available for women who gave birth to the child and lasts until 8 weeks or 2 months post-partum. Parental leave is—at least since the 1992-reform—available to both parents, and women seamlessly transition into this spell after their statutory maternity leave. The granted length of parental leave varies between 18 months before and 36 months after the 1992-reform (no adjustments after the 2007-reform), starting with the child's birth (BMFSFJ, 2006, 2018a, 2018b; Spiess &

Table 1 Overview of the difference in parental leave entitlements of job protection and financial benefits across the three parental leave policy reform periods of 1991 and earlier, 1992 to 2006, and from 2007 onwards in Germany for parental leave lengths in categories of 2 (statutory maternity leave), 3–12, 13–24, and 25–36 months

Parental leave length		2 (Statutory) months	3–12 months	13–24 months	25–36 months
Parental leave legislation period	Job protection regulation				
	Reform period				
	Before 1992	Yes	Yes	Yes (up to 18 months)	No
	1992 to 2006[a]	Yes	Yes	Yes	Yes
	From 2007[2]	Yes	Yes	Yes	Yes
	Financial benefits (income compensation)				
	Before 1992	Full	€300–450	No	No
	1992 to 2006[b]	Full	€300–450[b]	€300–450[c]	No
	From 2007[b]	Full	€300–1,800 (12–14 months)[c]	No[d]	No

Job Protection regulations and financial benefits for mothers in Germany for different parental leave lengths and reform periods. Currency of financial benefits before the introduction of the Euro in 2001 was recalculated from Deutsche Mark into Euro

[a] From the reform of 1992 onwards, fathers have been entitled to parental leave for up to 3 years after the child's birth, which is offset against the mother's leave additional to the statutory period. These regulations are omitted in this table for reasons of clarity

[b] Income compensation depended on the maternity leave length, Parental leave benefits of €300 per month were paid for a maximum of 24 months; alternatively, higher monthly benefits of around €450 per month could be received for a maximum of 12 months

[c] The 67% income reimbursement can be received 14 months post-partum if parental leave is allocated between both parents

[d] A partial income compensation ("Elterngeld Plus") can be paid for up to 24 months post-partum given the parent on leave works part-time. However, since our maternity leave measure would not capture those cases as on maternity leave (due to how the underlying variable from the VSKT is coded), we do not refer to this variation of the maternity leave reform of 2007

Wrohlich, 2008). A key component of the parental leave period is the entitlement to full job protection, guaranteeing women the right to return to their previous employment position and workplace.

Second, the entitled financial benefits: The financial benefits during the parental leave depend on the specific moment of the parental leave trajectory. During the statutory maternity leave, women receive total income compensation up to 2 months post-partum. Starting with the parental leave, women receive income compensation as financial benefits. These are income-related throughout all reform periods, with an unconditional minimum amount and a maximum ceiling amount, with a hierarchical tier model before (BMFSFJ, 2006) and a relative income-compensation approach after the 2007-reform (Spiess & Wrohlich, 2008). The compensation amount ranges from €300 to €450 per month before to €300 to €1,800 after the 2007-reform (no adjustments in between with the 1992-reform) (BMFSFJ, 2006; Spiess & Wrohlich, 2008). The entitlement period and modality have changed with the policy reforms with up to 12 months before and up to 24 months after the 1992-reform (BMFSFJ, 2006; Ondrich et al., 2003), and up to 12 or 14 (dependent on if only one or both parents utilise a minimum of 2 months of

parental leave) or 24 months with part- and full-income-compensation modalities after the 2007-reform (Spiess & Wrohlich, 2008; see Kluve & Tamm, 2013 for further details on the German parental leave legislation).

Data

Data description and sample construction

The current study uses rich longitudinal data provided by the German Statutory Pension Fund (DRV), the FDZ-Biografiedatensatz für die Biografiedaten der Versicherten (VSKT) [Pension dataset on the biography data of insured persons], which includes employment biographies as a panel with monthly entries (DRV, 2018b). The VSKT represents a unique stratified random sample of all pension accounts for Germans aged between 30 and 67 years living in Germany at the end of each reporting period (31 December of every year).

Data from the VSKT are made available through scientific use files (SUFs) released annually by the German Statutory Pension Fund research data centre (FDZ-DRV). While the VSKT is a rotating panel (with new cohorts entering and exiting the panel due to the age limits mentioned above), each annually released SUF (or wave) contains only a 25% stratified random subsample of pension accounts in the VSKT. Each wave consists of a fixed part, which provides information on demographic characteristics and several quantities used to determine pension eligibility and accrued pension benefits concerning the reference date (31st December of each reporting year). In addition, the longitudinal part of the data provides detailed employment biographies for each individual for every month between January of the year in which the individual turns 14 years old and the end of the reporting period (i.e., at most up to December of the year in which they turn 67).

The main advantage of the VSKT data lies in its richness and accuracy. The monthly employment history information enables us to determine the exact length of each woman's parental leave. The administrative nature of data offers further advantages, such as objective and reliable measures of income, age, and health. Additionally, the data contain only a few missing values over a reasonably long period, which allows us to analyse several parental leave policies.

To maximise our sample size, we combine data across all annual waves of the VSKT for the period 2011 to 2019. Because each SUF consists of a random subsample of the larger VSKT, some individuals may appear in several waves of the VSKT. Unfortunately, the SUF does not contain a unique identifier allowing us to link individuals across waves. Therefore, we match individuals by year and month of birth and their monthly employment biographies to identify potential duplicates.

We restrict our sample to women born between 1955 and 1984, who had their first child between 1 January 1991 and 31 December 2016 when they were 20 to 39 years old. Furthermore, to ensure a certain degree of work attachment as well as a legal entitlement to parental leave, we select those women who were working at least up to 9 months before their child's birth (i.e., possible moment of the conception) and who continue to work during at least four out of their first six months of pregnancy. We also exclude women who had a second child less than nine months after the birth of their first child (for example, twins or due to adoptions). Finally, we exclude women who were on sick

leave or had a second child during their parental leave for their first child. In total, our working sample includes 29,001 women.

Women's parental leave length

Our dependent variable is the women's parental leave length measured in months. In line with the OECD (2017), we define parental leave as the time women take off from work, combining both the statutory maternity leave (in German: "Mutterschutz") and consecutive parental leave (in German: "Elternzeit") within 3 years after the women's first child had been born resembling the maximum length of parental leave available (BMFSFJ, 2006, 2018b). This definition enables the international and comparative contextualisation of our analysis of parental leave lengths within the German context (see Rizzi & Rees, 2023). To build the parental leave measure, we start with a variable documenting women's monthly 'social employment situation'. This variable has several categories, including the "childrearing and household" category (DRV, 2018a). This category reflects periods during which individuals received pension credits. These credits are only given to the primary caregiver of a child, which the legislation assumes to be the mother unless otherwise requested by both parents. It is important to note that these periods do not necessarily imply that the individual received any financial benefits or benefitted from other parental leave policies (for example, job protection). We nevertheless argue that these periods represent parental leave, because the coding of the "social employment situation" variable ensures that individuals coded as "childrearing and household" are neither working nor registered as looking for work. Thus, we define each woman's parental leave length as the period between their first child's birth and the last month coded as "childrearing and household" within 36 months post-partum. We code the variable as follows: 2 months (statutory maternity leave, reference category), 3–12 months, 13–24 months, 25–36 months, and > 36 months.

The main explanatory variables

We analyse how women's parental leave length uptake differs across three main parental leave policy reform periods. Building on the existing literature, we focus on two parental leave reforms in Germany in 1992 and 2007, and we explore their impact on women's parental leave uptake along with the changing composition of their characteristics for each leave length (i.e., their age when transitioning into motherhood and their prior health status, individual income, and education). We focus on parental leave when women had become first-time mothers to ensure a homogeneous study population and to avoid possible influences of, for example, previous birth complications or declining labour market attachment on the length of parental leave (cf. Kuhlenkasper & Kauermann, 2010).

We assess how women's characteristics are associated with their realised parental leave length and how women responded differently to the parental leave reforms based on the following characteristics: women's (1) age when transitioning into motherhood in categories (20–24, 25–29, 30–34, and 35–39 years); (2) health status before the transition into motherhood as a dummy (for registered sick leaves from work lasting at least 6 weeks); (3) income percentiles measured 12 months prior to their first child's birth in categories (25 percentile and lower, 26–50 percentile, 51–75 percentile, and above 75

percentile). Income is measured using pension points, calculated based on a person's income subject to pension insurance contributions. We define income quartiles based on the highest reported monthly income 12 months before. We also use information on women's education derived from the occupational code transmitted at specific time points (for example, registration or de-registration of an employee) by an individual's employer to the German pension fund. We define three levels of education—(i) tertiary education for individuals with a university degree, (ii) upper secondary education for individuals with "Abitur", which is granted after 12 or 13 years of schooling and required to attend university, and (iii) lower secondary education for individuals with a secondary degree below "Abitur" (usually 9 or 1 years of schooling). Due to a substantial amount of missing data on the education variable (~35% of the sample), we also generated an indicator for women with missing education information.

Descriptive statistics

Table 2 shows summary statistics for our working sample. On average, women took 12 months of parental leave in the first 3 years after transitioning into motherhood. Over 60% of the sample took either the statutory leave of 2 months or a parental leave between 3 and 12 months. 11% of the sample took between 24 and 36 months of parental leave, and 5% took more than 3 years. Most women in our sample become first-time mothers

Table 2 Sample characteristics

	Mean	Standard deviation	Min	Max	N
Parental leave length in months	11.905	10.846	1	36	29,001
In categories					
2 months (statutory)	0.325	0.469	0	1	29,001
3–12 months	0.311	0.463	0	1	29,001
13–24 months	0.206	0.405	0	1	29,001
24–36 months	0.106	0.308	0	1	29,001
> 36 months	0.052	0.221	0	1	29,001
Prior sick leaves	0.147	0.354	0	1	29,001
Maternal age at first child					
20 to 24 years	0.144	0.351	0	1	29,001
25 to 29 years	0.391	0.488	0	1	29,001
30 to 34 years	0.349	0.477	0	1	29,001
35 to 39 years	0.115	0.319	0	1	29,001
Prior income in quartiles					
1st quartile	0.250	0.433	0	1	29,001
2nd quartile	0.250	0.433	0	1	29,001
3rd quartile	0.250	0.433	0	1	29,001
4th quartile	0.250	0.433	0	1	29,001
Education					
Tertiary education	0.146	0.353	0	1	21,368
Upper secondary education	0.210	0.407	0	1	19,347
Lower secondary education	0.643	0.479	0	1	19,347

'Parental leave length' measures the length of parental leave in the first 3 years after transitioning into motherhood in months. The minimum value of this variable is one, because the 1st month of parental leave is the month of the child's birth, i.e., month 0. All other variables are binary indicators

at the ages 25–34. The majority (~64%) of the sample has a lower secondary education, with about 15% of women having a tertiary education. 15% of women had experienced a prior spell of sick leave.

Methods

We conduct our analysis in three steps: First, we estimate associations between women's characteristics and their realised parental leave lengths. Then, we document how the parental leave reforms of 1992 and 2007 affected the women's parental leave length. Finally, we show how these reforms affected the parental leave lengths for specific subgroups of women.

Associations between women's characteristics and the length of parental leave

We document associations between women's characteristics and their realised parental leave length after their first transition into motherhood by estimating linear regression models using our measures of parental leave length as an outcome variable and women's age when and their health status, income, and education before transitioning into motherhood as control variables. We use heteroskedasticity-robust standard errors.

We also conduct a survival analysis for our continuous measure of parental leave length in months. Our data are structured in monthly intervals, and we, therefore, estimate a discrete-time proportional hazard model using complementary log–log regression (Jenkins, 2005a, 2005b). The baseline hazard is specified using a piecewise-constant specification, i.e., we include one binary indicator for months 1–3, binary indicators for every month between 4 and 36, and binary indicators for 12-month periods between months 37 and 120.

Effects of parental leave reforms on parental leave length

We evaluate the impact of two major parental leave reforms in Germany in 1992 and 2007 on women's realised parental leave length using a Regression Discontinuity Design. Intuitively, we estimate these reform effects by comparing the average length of parental leave for children that were born in a narrow window (referred to as the "bandwidth" in an RDD) around the date when the reforms came into effect (1 January 1992 and 1 January 2007, respectively). Any change in the length of parental leave following the reform is attributed to the causal impact of these reforms under two assumptions: (i) there were no other sudden changes that affected women's parental leave uptake close to these dates, i.e., in the absence of these reforms, any changes in the average length of women's parental leave over time would have followed a smooth trend, and (ii) women were not able to precisely manipulate whether they would have their children before or after the reform came into effect. While we cannot entirely rule out any possible violations of these assumptions, we argue that they are plausible here and allow us to interpret our RDD estimates as causal effects. We also conduct several robustness checks that fail to detect any potential violations of these assumptions (see the section "Robustness").

We estimate these regression discontinuity designs using local nonparametric regression models with a data-driven selection of the optimal bandwidth (Calonico et al., 2014). We report bias-corrected estimates with robust variance estimators. Because we

limit our sample to parental leave uptakes for children born from 1991 onwards, the optimal bandwidth on the left side of the discontinuity for the 1992-reform will be larger than the bandwidth used in our analysis. A smaller than optimal bandwidth would be expected to reduce bias but lead to estimates with a larger variance.

Reform effects for population subgroups

We examine how the parental leave reforms of 1992 and 2007 affected women's parental leave uptake for different subgroups by re-estimating the RDD described above for women stratified by the age when they had their first child and their prior sick leaves, income, and education. We report separate RDD estimates for each of the subgroups in our sample.

Results

Women's characteristics and their parental leave length

We first document associations between women's characteristics and their realised parental leave length. Figure 1 shows the predicted survival curve for our working sample based on the estimates from our discrete-time proportional hazard regression model. In line with the descriptive statistics in Table 1, we note a marked decline in the probability of being on parental leave after 12 months and again after 36 months. Aside from these two drops, the survival curve is relatively smooth, implying considerable variation in the women's realised parental leave length, even within the categories we defined for our analysis.

We complement the survival analysis by estimating the overall associations between women's characteristics and their realised parental leave length as a continuous measure and in categories of 2, 3–12, 13–24, and 25–36 months (see Table A.1 in the online appendix). Higher age when becoming a mother and higher income are associated with a prolonged parental leave, while higher education is associated with a decreased parental leave. The analyses of women's parental leave length in categories reveal some subtle differences; for example, a higher age when becoming a mother

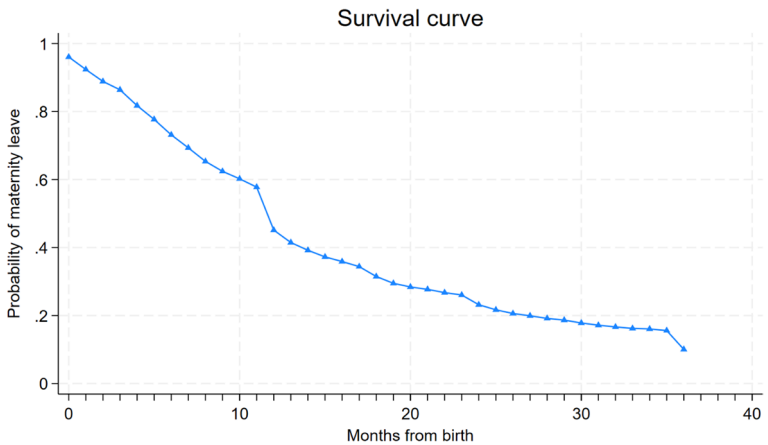

Fig. 1 Survival curve for the sample of working women. The figure shows the predicted average survival probability for our working sample based on estimates from a discrete-time proportional hazard survival regression model

is positively associated with a leave uptake longer than 24 months, higher income is positively associated with leave uptakes between 3 and 24 months and negatively associated with the uptake of the statutory maternity or a leave uptake longer than 24 months, and higher education is positively associated with a leave uptake of 3–12 months and negatively with a leave uptake longer than 13 months.

Effects of parental leave reforms on women's realised parental leave length

Figures 2 and 3 show the women's average parental leave length by birth month for children born within a 3-year time window around the 1992- and 2007-reforms. First, we note that there is substantial variation by month of birth, likely due to the limited sample size—for the 1992-reform, we observed between 43 and 98 births per month, and for the 2007-reform, we observed between 94 and 169 births per month. Despite this limitation, we observe an apparent increase in the share of women with parental leave between 25 and 36 months following the 1992-reform. In contrast, Fig. 3 suggests that following the 2007-reform, the share of women taking a leave between 25 and 36 months declined, and the share of women taking any shorter leave, most noticeably for the 3–12 months category, increased.

Table 3 shows RDD estimates of these reform effects. We find that the 1992-reform led to a 7.4 percentage point increase in the probability of taking between 25 and 36 months of parental leave and a 10 percentage point decrease in the probability of taking a leave longer than 36 months. These effects are statistically significant at the 5% level. For the 2007-reform, we find an 8.5 percentage points increase in the probability to take between 3 and 12 months of leave (significant at the 1% level), a 4.1 percentage point increase in the probability to take between 13 and 24 months of leave (significant at the 5% level), and a 3.2 percentage point decrease in the probability to take between 25 and 36 months leave (significant at the 10% level).

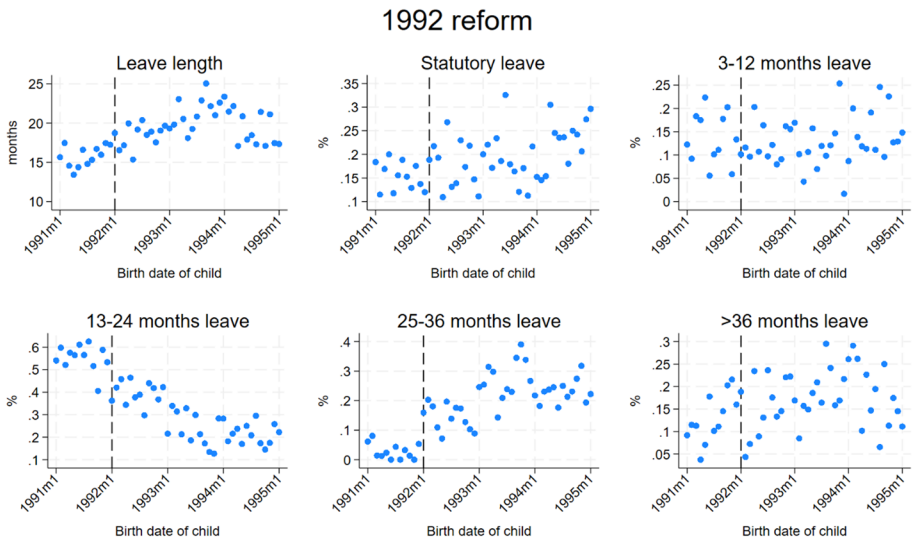

Fig. 2 Women's average parental leave length by birth month for the reform of 1992. The figure shows averages for the outcome specified in each panel by month of birth. The vertical line marks the implementation of the parental leave reform on 1 January 1992

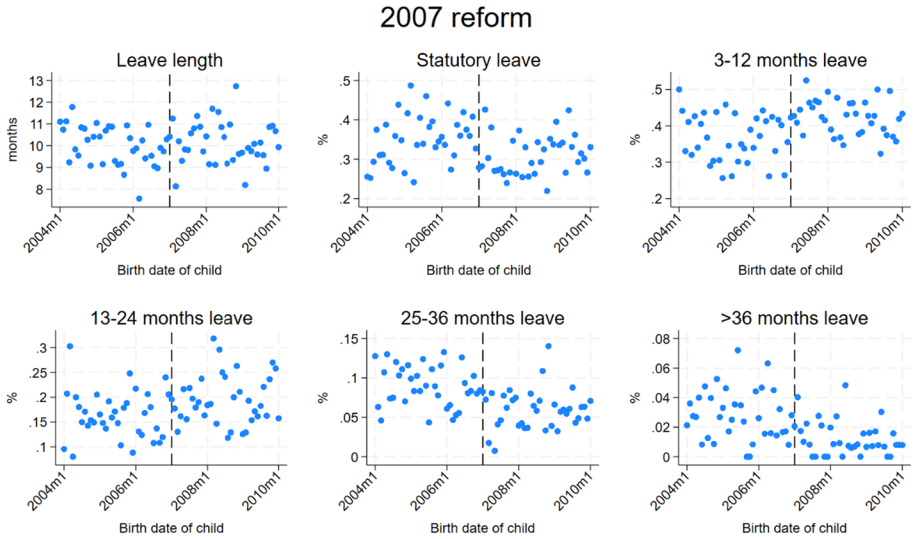

Fig. 3 Women's average parental leave length by birth month for the reform of 2007. The figure shows averages for the outcome specified in each panel by month of birth. The vertical line marks the implementation of the parental leave reform on 1 January 2007

Table 3 Reform effect on women's realised parental leave length—Regression Discontinuity Design (RDD) estimates

	Leave length	Statutory leave	3–12 month leave	13–24 month leave	25–36 month leave	> 36 months leave
2007						
All	0.093 (0.641)	− 0.043 (0.031)	0.085*** (0.024)	0.041** (0.017)	− 0.032* (0.016)	− 0.005 (0.007)
East	0.829 (0.698)	− 0.075 (0.051)	0.058 (0.053)	0.059* (0.031)	− 0.018 (0.021)	− 0.013 (0.009)
West	− 0.163 (0.789)	− 0.027 (0.038)	0.090*** (0.032)	0.022 (0.023)	− 0.036* (0.021)	0.002 (0.008)
1992						
All	− 1.365 (1.365)	0.070 (0.048)	0.006 (0.045)	− 0.046 (0.068)	0.074** (0.033)	− 0.100** (0.050)
East	− 1.620 (1.762)	0.054 (0.055)	− 0.020 (0.079)	0.039 (0.113)	0.069* (0.039)	− 0.137* (0.073)
West	− 1.199 (1.811)	0.073 (0.064)	0.021 (0.055)	− 0.097 (0.081)	0.074* (0.043)	− 0.070 (0.064)

Estimates shown are bias-corrected nonparametric RDD estimates for the effect of the reform on parental leave length. Column 1 shows result using the total length of parental leave as an outcome, and columns 2–5 show results for the specified categories of parental leave

Robust standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Effects for East and West German women are broadly similar, and we only present combined estimates for the following analyses.

Effects of parental leave reforms on women's realised parental leave length in subgroups

We examine changes in the selection into parental leave length following the two parental leave reforms in Germany by re-estimating the RDD models for specific subgroups of women defined by the characteristics considered in the section "Women's characteristics and their parental leave length". We present these estimates visually in Figs. 4 and 5 to facilitate comparisons across subgroups. Each marker in these figures represents a separate RDD estimate for the specified subgroup and outcome. We

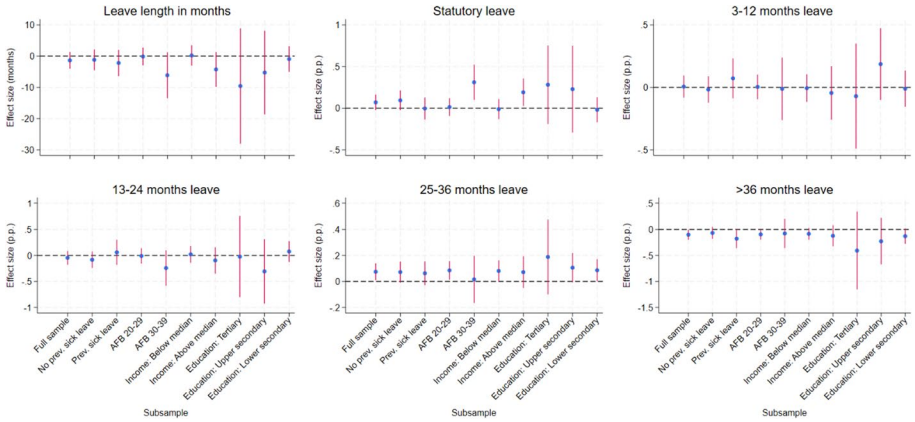

Fig. 4 Heterogeneity for the reform of 1992. Each marker represents a separate RDD estimates. Estimates come from a nonparametric local polynomial regression with a data-driven optimal bandwidth choice, bias correction, and robust variance estimators. The lines represent 95% confidence intervals. Observations on the left side of the discontinuity only include births that occurred from 1991 onwards

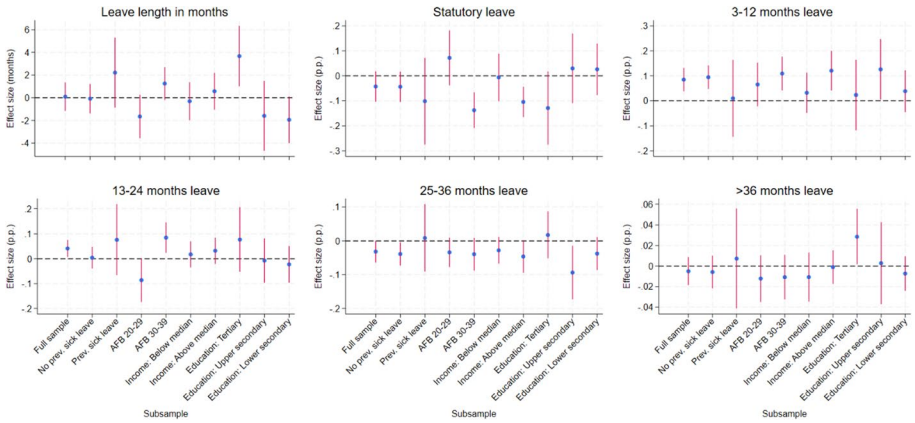

Fig. 5 Heterogeneity for the reform of 2007. Each marker represents a separate RDD estimates. Estimates come from a nonparametric local polynomial regression with a data-driven optimal bandwidth choice, bias correction, and robust variance estimators. The lines represent 95% confidence intervals

reduced the number of categories for age when transitioning into motherhood and income to reduce the complexity of the figure and to increase the sample size in our RDD regressions.

Figure 4 shows minimal heterogeneity in the effects of the 1992-reform. We observe an increase in women's probability of taking parental leave of 24–36 months for most subgroups, except women who became mothers aged 30 and above, those with an income above the median, and women with tertiary education. Similarly, we observe a decrease probability of taking parental leaves longer than 36 months for all other subgroups. For women aged 30 and above and with an income above the median, we observe an increased probability of taking statutory maternity leave.

For the 2007-reform, we observed an increase in women's average parental leave length by almost 4 months for women with a tertiary education. The significant decrease in the probability of taking only statutory maternity leave reported earlier primarily stems from women aged 30 and above and those with an income above the median. For both

groups, we also observed a significant increase in the probability of taking 3–12 month leave. We also observe an increase in the probability of taking 3–12 months of leave for women without previous sick leave. While women who became mothers aged 30 and above are significantly more likely to take 13–24 months of leave following the reform, those who did at a younger age are less likely to take such leaves. Finally, the decreased probability of taking 24–36 months of parental leave occurs in most subgroups (albeit not always statistically significant), except women with previous sick leave and women with tertiary education.

These findings suggest that these reforms affected parental leave lengths for primarily women who became mothers after age 30, with a higher income, and with tertiary education.

Robustness

We conduct a series of diagnostic checks to assess the robustness of our results. We focus on the robustness of our RDD estimates of the effects of the two parental leave reforms on women's realised parental leave length.

First, we implement a density continuity test (Cattaneo et al., 2020) to check for discontinuities in the distribution of the assignment variable in our RDD (i.e., birth date of the child). Suppose the distribution of the assignment variable is not smooth around the threshold. In that case, this may indicate that individuals can manipulate the assignment variable close to the threshold and thus select a treatment. For both reforms, the density continuity test does not reject the null hypothesis that the distribution of birth dates around the date of the reform is smooth.

Second, we consider the robustness of our estimates concerning the chosen bandwidth. Intuitively, the bandwidth represents a trade-off between bias and variance. Estimates based on a larger bandwidth will have a lower variance because more observations are used on both sides of the threshold but a larger potential bias because the local linear trend does not sufficiently fit the data. Conversely, a smaller bandwidth reduces the bias but leads to a larger variance. The estimated optimal bandwidth for the RDD estimates shown in Table 3 varies between 22 and 60 months, with most estimates using a bandwidth between 24 and 36 months on both sides of the threshold. As a robustness check, we consider a smaller bandwidth of 12 months on both sides of the threshold. The results in Table A.2 in the online appendix broadly confirm our findings. While none of the estimates for the 2007-reform are statistically significant, the increase in the 3–12 month leave category observed in Table 3 is even larger with this smaller bandwidth. The lack of statistical significance is not surprising, given the reduction in sample size. For the 1992-reform, the significant positive effect for the 25–36 months category also increases in magnitude (from 7.4 to 12 percentage points) and remains statistically significant.

Third, we re-estimate our RDD regression models with control variables for education (binary variables for upper secondary and tertiary education), age at first-time motherhood over 30, and an income above the median. If the RDD assumptions hold, the estimated reform effects should not be sensitive to the inclusion or exclusion of such predetermined control variables. Significant changes in the estimates indicate selection

bias. Table A.3 shows that the estimates reported in Table 3 are robust to including these covariates.

Finally, in a related check, we plot average levels of these predetermined covariates against the child's birth date. Since these covariates are unrelated to the parental leave reforms, we expect no discontinuity in these trends around the date of these reforms. A discontinuity in these trends (at the threshold or elsewhere) could indicate selection effects or alternative interventions, which would violate the required RDD assumptions. Figs. A.1 and A.2 in the online appendix show that all four predetermined variables considered here follow a smooth trend over time. These diagnostic checks fail to detect any violation of the required RDD assumptions. Therefore, the reform effects estimated in the sections "Effects of parental leave reforms on parental leave length" and "Reform effects for population subgroups" can be interpreted as causal.

Discussion

Summary of results

In this study, we explore the impact of changing public parental leave entitlements on the selection of women into different parental leave lengths in Germany from 1991 to 2016. Our results show a decline in women's overall probability of being on parental leave after 12 months and again after 36 months. Generally, women who became mothers at a higher age and with higher income were associated with longer parental leaves. In contrast, higher education was associated with parental leaves shorter than 12 months. However, when analysing women's realised parental leave lengths in categories of 2 (statutory maternity leave), 3–12, 13–24, 25–36, and more than 36 months, the results by women's characteristics became more nuanced. Specifically, women who became mothers at a higher age tended to take parental leaves longer than 24 months, whereas higher income was positively associated with parental leaves between 3–12 and 13–24 months. Higher education was associated with parental leaves of 3–12 months.

The analysis of the parental leave policy reforms revealed an increase in women's uptake of parental leaves of 25–36 months following the 1992-reform and a decrease in the same category following the 2007-reform, which was, however, accompanied by an increase in women's uptake of parental leaves of 3–12 months. The policy analysis by subgroups generally revealed women's increased uptake of parental leaves longer than 12 months following the reform of 1992, except for women who became mothers at an older age, with higher income and of higher education. In turn, the reform of 2007 was followed by women's increased uptake of parental leaves shorter than 12 months for women with higher income, of higher education, who became mothers at a younger age, and without previous sick leave. However, women who became mothers at an older age tended to take 13–24 months.

Results and discussion

Our analysis reveals individual differences in women's realised parental leave lengths along their characteristics and emphasises how leave policies interact with these characteristics. Therefore, our results on the association between women's characteristics and their realised parental leave length challenge the perception of the appropriate parental leave length for women after transitioning into motherhood and

to succeed in reconciling family and employment. Specifically, they point to the general importance of extended parental leave lengths of at least 12 months available to women.

First, women with a higher labour market attachment who thus risk a greater motherhood penalty (cf. England et al., 2016; Mari & Cutuli, 2021), those with a higher education or higher income, are more likely to take up 12 months as maximum. At the same time, these women also have more resources to afford such leaves. Therefore, this finding highlights, on the one hand, that the parental leave length perceived as appropriate after the transition into motherhood by the legislator might not match the actual needs of women. For instance, at the European level, 14 weeks or roughly 3.5 months is the minimum parental leave length (Directorate-Generale for Internal Policies, 2010). On the other hand, the fact that women who access these leave are likely more advantaged points to inequalities in parental leave uptake. In line with the previous studies, these findings may support implications of the "traditional" labour market opportunities in Germany, forcing particularly women with lower education and a weaker labour market attachment into part-time employment arrangements to enable reconciliation of family and employment (Konietzka & Kreyenfeld, 2010).

Second, women who took up leaves longer than 12 months had either higher income or indicated disadvantaged health conditions. Specifically, we find that those women who had sick leave or became mothers at an older age take leaves that are longer than 12 months. In line with previous studies, this finding highlights the importance of more extended leave to avoid excluding more vulnerable women from the labour market (Bister et al., 2023; Guertzgen & Hank, 2018). Access to more extended parental leave does not necessarily translate into a universal utilisation. Instead, it raises the inclusivity and equality of labour market opportunities for less-advantaged women.

Our findings on the impact of different parental leave reforms show that the extension of job protection in 1992 to up to 36 months led to an increase in leaves between 25 and 36 months, and the increase in financial benefits in the first year in 2007 led to two shifts—a reduction in leaves longer than 24 months, and a reduction in the uptake of only the statutory leave. However, our analysis also shows that these average trends differ for all women. Instead, specific subgroups of women respond differently to the changing balance between extended parental leave lengths and increased financial benefits. Specifically, in line with the previous findings (Schönberg & Ludsteck, 2014), women with higher income and of higher education responded more strongly to the increase in financial benefits after the 2007-reform and took parental leaves up to 12 months (Spiess & Wrohlich, 2008). This finding can be interpreted as a positive response to the parental leave reform of 2007, which aimed to incentivise women with a high labour market attachment and human capital for an earlier return to their employment after the transition into motherhood (Geyer et al., 2015).

It is, however, essential to highlight that this group of women relies on sufficient resources to compensate for shorter parental leave lengths with marginal financial incentives. In other words, a minor increase in the financial incentive might enable this group of women to externalise more childcare (topping up on their resources) and return earlier to work. At the same time, these results imply that more disadvantaged groups of women might require other approaches to facilitate their return to the labour market, for example, women of lower education (Konietzka & Kreyenfeld, 2010; Kuhlenkasper

& Kauermann, 2010) or in worse health (Bister et al., 2023; Guertzgen & Hank, 2018). Women with prior sick leaves were excluded from the impact of the 2007-reform of the financial incentives. This insight emphasises the importance of including a health dimension of the analysis of women's parental leave uptake in Germany, providing insights into the selection and the tenures of parental leave in more vulnerable women and potentially aiding in explaining long-term maternal health consequences of parental leave policies (Bister et al., 2023; Guertzgen & Hank, 2018).

Limitations

We acknowledge several limitations of our study. In particular, our data do not include partner or household information, which has various consequences for interpreting our results. Partner and household characteristics, however, are considered in the design of the parental leave policy (Spiess & Wrohlich, 2008). First, we cannot evaluate how household income, which may be more relevant in the individual assessment of financial benefits and affordable leave length than women's income, affects leave uptake. Second, we do not obtain information on the division of unpaid work within the household or father's uptake of parental leave. Although equal shares of parental leave between fathers and mothers is still rare in Germany (Samtleben, Schäper, and Wrohlich 2019), this information could shed light on the gender-egalitarian attitudes of both parents. Subsequently, the partner supports a woman returning to the labour market after transitioning into motherhood.

Moreover, we must acknowledge that our results adhere to a specific context. Germany still has a relatively conservative family culture with strong intensive mothering ideologies, likely reflected in the care responsibilities after the transition to motherhood and the opportunities in the labour market. The parental leave legislation, at least until 2007, favours these prevailing conservative gender role models (see Gottschall & Bird, 2003), and thus may impact women's realised parental leave lengths. Although the parental leave reform of 2007 provides—mainly financial—incentives for women to return to their work soon after the transition into motherhood (Spiess & Wrohlich, 2008), the parent with the higher income is less incentivised to take any or a considerable share of the available parental leave due to the proportionally higher income loss (Geisler & Kreyenfeld, 2011).

Conclusions

Our study indicates vast differences in women's realised parental leave length in Germany, showing that parental leave entitlements during the past decades were not universally adherent to women's needs after transitioning into motherhood. Our findings particularly highlight the intricate relationship between policy changes and women's characteristics in shaping their realised parental leave lengths, suggesting more tailored parental leave entitlements to individual characteristics of women. Furthermore, the interplay of individual needs with the cultural acceptance of motherhood and employment both at the individual and societal level contributes another relevant angle to understanding women's selection into parental leave lengths. Given this interplay between cultural, institutional, and individual conditions, our main findings are similarly relevant in contexts other than the German one: the provision of public parental leave schemes should aim to adapt to

women's specific needs and circumstances after transitioning into motherhood, reflecting the heterogeneity in labour market conditions, available social support, and individual health prerequisites these women experience. This objective in parental leave legislation helps to ensure optimal reconciliation support for women after transitioning into motherhood, particularly to those who are vulnerable, thereby maximise their individual benefit due to the parental leave utilisation and, at the same time, preventing the selection-driven reinforcement of structural inequalities in female labour market attachment in the long run.

Following the current international debate on the expansion of parental leave schemes for fathers, future research may particularly address women's and men's selection into parental leave lengths at the couple level, i.e., consider fathers' parental leave uptake and realised length (Geisler & Kreyenfeld, 2011; Samtleben, Schäper, and Wrohlich 2019). This perspective will aid in drawing a complete picture of the complex interplay between parental leave legislation, family-cultural contexts, and women's selection into parental leave lengths, potentially creating a more nuanced picture on the long-term consequences of parental leave policies for the female labour force participation, both at the individual and the societal level (Schönberg & Ludsteck, 2014), women's long-term health (Bister et al., 2023; Guertzgen & Hank, 2018), and other relevant life course outcomes.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s41118-024-00221-4.

Additional file 1.

Acknowledgements
This work originated from a master thesis of the first author in the M.Sc. Population Studies, University of Groningen (2018-2019). The research was conducted during a research internship at the research group Labor Demography, Max Planck Institute for Demographic Research (2019). The first author thanks the Max Planck Institute for Demographic Research for hosting and the Erasmus+ traineeship programme of the European Union for funding the internship. This work has further greatly benefitted from discussions with colleagues Mine Kühn and Karen van Hedel.

Author contributions
LB: conception, study design, acquisition of data, interpretation of the data, draft, and revision of manuscript; PE: idea, conception, acquisition of analysis, interpretation of the data, draft, and revision of manuscript; RR: study design, interpretation of the data, draft, and revision of manuscript.

Funding
The authors kindly acknowledge funding from the ERASMUS + programme of the European Union for a research visit of the first author to the Max Planck Institute for Demographic Research, Germany to conduct the analyses presented in this paper.

Availability of data and materials
This study uses data from the German Statutory Pension Fund (DRV) from 2015. The data are not publicly available, yet they can be requested from the DRV research data centre: https://www.eservice-drv.de/FdzPortalWeb/dispcontent.do?id=main_fdz_english. Meta data, analysis files, and further analyses are available from the authors upon reasonable request.

Declarations

Competing interests
The authors have no competing interests to declare.

Received: 28 February 2023 Accepted: 28 June 2024
Published online: 01 October 2024

References

Aitken, Z., Garrett, C. C., Hewitt, B., Keogh, L., Hocking, J. S., & Kavanagh, A. M. (2015). The maternal health outcomes of paid maternity leave: A systematic review. *Social Science & Medicine, 130*, 32–41. https://doi.org/10.1016/j.socscimed.2015.02.001

Andres, E., Baird, S., Bingenheimer, J. B., & Markus, A. R. (2016). Maternity leave access and health: A systematic narrative review and conceptual framework development. *Maternal and Child Health Journal, 20*(6), 1178–1192. https://doi.org/10.1007/s10995-015-1905-9

Barnes, M. W. (2014). Deciding on leave: How us women in dual-earner couples decide on maternity leave length. *Families, Relationships and Societies, 3*(1), 3–18. https://doi.org/10.1332/204674313X13835741904375

Bister, L., Eibich, P., Rutigliano, R., Kühn, M., & Van Hedel, K. (2023). Selection into maternity leave length and long-run maternal health in Germany. *Journal of Social Policy*. https://doi.org/10.1017/S0047279423000429

BMFSFJ (2006). Erziehungsgeld, Elternzeit. Das Bundeserziehungsgeldgesetz. [Childcare benefit, parental leave. The federal childcare benefit law]. .

BMFSFJ (2018a). Elterngeld, ElterngeldPlus und Elternzeit. Das Bundeselterngeld- und Elternzeitgesetz. [Parental benefit, parental benefit plus, and parental leave. The federal parental benefit and leave law]. .

BMFSFJ (2018b). *Mutterschutzgesetz [Maternity Protection Act]*. https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl117s1228.pdf#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl117s1228.pdf%27%5D__1558450252780. Accessed 7 June 2022.

Borck, R. (2014). Adieu Rabenmutter—culture, fertility, female labour supply, the gender wage gap and childcare. *Journal of Population Economics, 27*(3), 739–765. https://doi.org/10.1007/s00148-013-0499-z

Brugiavini, A., Pasini, G., & Trevisan, E. (2013). The direct impact of maternity benefits on leave taking: Evidence from complete fertility histories. *Advances in Life Course Research, 18*(1), 46–67. https://doi.org/10.1016/j.alcr.2012.10.003

Burgess, S., Gregg, P., Propper, C., & Washbrook, E. (2008). Maternity rights and mothers' return to work. *Labour Economics, 15*(2), 168–201. https://doi.org/10.1016/j.labeco.2005.05.010

Burt, K. B., & Scott, J. (2002). Parent and adolescent gender role attitudes in 1990s Great Britain. *Sex Roles, 46*(7/8), 239–245. https://doi.org/10.1023/A:1019919331967

Calonico, S., Cattaneo, M. D., & Titiunik, R. (2014). Robust nonparametric confidence intervals for regression-discontinuity designs: robust nonparametric confidence intervals. *Econometrica, 82*(6), 2295–2326. https://doi.org/10.3982/ECTA11757

Cattaneo, M. D., Jansson, M., & Ma, X. (2020). Simple local polynomial density estimators. *Journal of the American Statistical Association, 115*(531), 1449–1455. https://doi.org/10.1080/01621459.2019.1635480

Collins, C. (2021). Is maternal guilt a cross-national experience? *Qualitative Sociology, 44*(1), 1–29. https://doi.org/10.1007/s11133-020-09451-2

Courtin, E., Rieckmann, A., Bengtsson, J., Nafilyan, V., Melchior, M., Berkman, L., & Hulvej Rod, N. (2022). The effect on women's health of extending parental leave: a quasi-experimental registry-based cohort study. *International Journal of Epidemiology*. https://doi.org/10.1093/ije/dyac198

Desai, S., & Waite, L. J. (1991). Women's employment during pregnancy and after the first birth: Occupational characteristics and work commitment. *American Sociological Review, 56*(4), 551. https://doi.org/10.2307/2096274

Diabaté, S., & Beringer, S. (2018). Simply the Best!?—Kulturelle Einflussfaktoren zum „intensive mothering" bei Müttern von Kleinkindern in Deutschland. *Journal of Family Research, 30*(3), 293–315. https://doi.org/10.3224/zff.v30i3.04

Directorate-Generale for Internal Policies (2010). Costs and benefits of maternity and paternity leave. . http://www.europarl.europa.eu/document/activities/cont/201010/20101005ATT85068/20101005ATT85068EN.pdf. Accessed 17 June 2019.

DRV (2018a). *Code Plan FDZ-Biografiedatensatz Für Die Biografiedaten Der Versicherten Für Das Jahr 2015 (VSKT 2015). [Codebook for the FDZ Biography Data Set for the Biography Data of Insured Persons in the Year 2015 (VSKT 2015)]*. Forschungsdatenzentrum (FDZ) of the Deutsche Renten-versicherung (DRV).

DRV (2018b). *FDZ-Biografiedatensatz Aus Der Versicherungskontenstichprobe. Benutzerhinweise Methodische Umsetzung. [FDZ Biography Data Set for the Biography Data of Insured Persons. User Instruction on the Methodological Implementation]*. Forschungsdatenzentrum (FDZ) of the Deutsche Renten-versicherung (DRV).

Duvander, A.-Z., & Cedstrand, S. (2022). Gender equal parental leave use in sweden: the success of the reserved months. In C. De La Porte, G. B. Eydal, J. Kauko, D. Nohrstedt, P. T'Hart, & B. S. Tranøy (Eds.), *Successful Public Policy in the Nordic Countries* (pp. 263–283). Oxford University PressOxford.

England, P., Bearak, J., Budig, M. J., & Hodges, M. J. (2016). Do highly paid, highly skilled women experience the largest motherhood penalty? *American Sociological Review, 81*(6), 1161–1189. https://doi.org/10.1177/0003122416673598

Ennis, L. R. (2014). *Intensive mothering: The cultural contradictions of modern motherhood*. Demeter Press.

Gangl, M., & Ziefle, A. (2015). The making of a good woman: Extended parental leave entitlements and mothers' work commitment in Germany. *American Journal of Sociology, 121*(2), 511–563. https://doi.org/10.1086/682419

Gauthier, A. H. (2011). Comparative Family Policy Database, Version 3 [computer file]. www.demogr.mpg.de. Accessed 15 Dec 2021.

Gauthier, A. H. (2002). Family policies in industrialized countries: Is there convergence? *Population, 57*(3), 457. https://doi.org/10.3917/popu.203.0457

Geisler, E., & Kreyenfeld, M. (2011). Against all odds: Fathers' use of parental leave in Germany. *Journal of European Social Policy, 21*(1), 88–99. https://doi.org/10.1177/0958928710385732

Geyer, J., Haan, P., & Wrohlich, K. (2015). The effects of family policy on maternal labor supply: Combining evidence from a structural model and a quasi-experimental approach. *Labour Economics, 36*, 84–98. https://doi.org/10.1016/j.labeco.2015.07.001

Gottschall, K., & Bird, K. (2003). Family leave policies and labor market segregation in Germany: Reinvention or reform of the male breadwinner model? *Review of Policy Research, 20*(1), 115–134. https://doi.org/10.1111/1541-1338.d01-7

Guertzgen, N., & Hank, K. (2018). Maternity leave and mothers' long-term sickness absence: Evidence from West Germany. *Demography, 55*(2), 587–615. https://doi.org/10.1007/s13524-018-0654-y

Heshmati, A., Honkaniemi, H., & Juárez, S. P. (2023). The effect of parental leave on parents' mental health: A systematic review. *The Lancet Public Health, 8*(1), e57–e75. https://doi.org/10.1016/S2468-2667(22)00311-5
Hewitt, B., Strazdins, L., & Martin, B. (2017). The benefits of paid maternity leave for mothers' post-partum health and wellbeing: Evidence from an Australian evaluation. *Social Science & Medicine, 182*, 97–105. https://doi.org/10.1016/j.socscimed.2017.04.022
Hsiao, H. (2023). A cross-national study of family-friendly policies, gender egalitarianism, and work–family conflict among working parents. *PLoS ONE, 18*(9), e0291127. https://doi.org/10.1371/journal.pone.0291127
International Labour Office and Conditions of Work and Employment Programme. (2011). *Maternity protection resource package: From aspiration to reality for all*. ILO.
Jenkins, S. P. (2005a). Lessons (to accampany Survival Analysis op. cit.), 9 pdf files. . https://www.iser.essex.ac.uk/resources/survival-analysis-with-stata. Accessed 4 Nov 2023.
Jenkins, S. P. (2005b). Survival Analysis, unpublished Lecture Notes manuscript. . https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9bb46b98492c0d8e33ffbddab4a0f99d84f3f0c0. Accessed 4 Nov 2023.
Kluve, J., & Tamm, M. (2013). Parental leave regulations, mothers' labor force attachment and fathers' childcare involvement: Evidence from a natural experiment. *Journal of Population Economics, 26*(3), 983–1005. https://doi.org/10.1007/s00148-012-0404-1
Konietzka, D., & Kreyenfeld, M. (2010). The growing educational divide in mothers' employment: An investigation based on the German micro-censuses 1976–2004. *Work, Employment and Society, 24*(2), 260–278. https://doi.org/10.1177/0950017010362140
Kuhlenkasper, T., & Kauermann, G. (2010). Duration of maternity leave in Germany: A case study of nonparametric hazard models and penalized splines. *Labour Economics, 17*(3), 466–473. https://doi.org/10.1016/j.labeco.2009.12.001
Lapuerta, I., Baizán, P., & González, M. J. (2011). Individual and institutional constraints: An analysis of parental leave use and duration in Spain. *Population Research and Policy Review, 30*(2), 185–210. https://doi.org/10.1007/s11113-010-9185-y
Low, H., & Sánchez-Marcos, V. (2015). Female labour market outcomes and the impact of maternity leave policies. *IZA Journal of Labor Economics, 4*(1), 14. https://doi.org/10.1186/s40172-015-0029-1
Mari, G., & Cutuli, G. (2021). Do parental leaves make the motherhood wage penalty worse? *European Sociological Review, 37*(3), 365–378. https://doi.org/10.1093/esr/jcaa048
Morgenroth, T., & Heilman, M. E. (2017). Should I stay or should I go? Implications of maternity leave choice for perceptions of working mothers. *Journal of Experimental Social Psychology, 72*, 53–56. https://doi.org/10.1016/j.jesp.2017.04.008
OECD (2017). Key characteristics of parental leave systems. http://www.oecd.org/els/soc/PF2_1_Parental_leave_systems.pdf. Accessed 4 Apr 2024.
OECD. (2019). How does GERMANY compare? *The pursuit of gender equality: An uphill battle*. OECD Publishing.
Olsson, M. I. T., et al. (2023). Gender gap in parental leave intentions: Evidence from 37 countries. *Political Psychology, 44*(6), 1163–1192. https://doi.org/10.1111/pops.12880
Ondrich, J., Spiess, C. K., Yang, Q., & Wagner, G. G. (2003). The liberalization of maternity leave policy and the return to work after childbirth in Germany. *Review of Economics of the Household, 1*(1/2), 77–110. https://doi.org/10.1023/A:1021851531667
Pronzato, C. D. (2009). Return to work after childbirth: Does parental leave matter in Europe? *Review of Economics of the Household, 7*(4), 341–360. https://doi.org/10.1007/s11150-009-9059-4
Rizzi, E., & Rees, A. (2023). Belgian family policy from a comparative perspective: Does it support fertility and gender equity? *Quetelet Journal, 9*(1), 65–99. https://doi.org/10.14428/rqj2021.09.01.04
Samtleben, C., Schäper, C., & Wrohlich, K. (2019). Elterngeld und elterngeld plus: Nutzung durch Väter gestiegen, Aufteilung zwischen Müttern und Vätern aber noch sehr ungleich. *DIW Wochenbericht*. https://doi.org/10.18723/DIW_WB:2019-35-1
Schönberg, U., & Ludsteck, J. (2014). Expansions in maternity leave coverage and mothers' labor market outcomes after childbirth. *Journal of Labor Economics, 32*(3), 469–505. https://doi.org/10.1086/675078
Spiess, C. K., & Wrohlich, K. (2008). The parental leave benefit reform in Germany: Costs and labour market outcomes of moving towards the nordic model. *Population Research and Policy Review, 27*(5), 575–591. https://doi.org/10.1007/s11113-008-9086-5
Thornton, A., Alwin, D. F., & Camburn, D. (1983). Causes and consequences of sex-role attitudes and attitude change. *American Sociological Review, 48*(2), 211. https://doi.org/10.2307/2095106
Waldfogel, J. (2001). International policies toward parental leave and child care. *The Future of Children, 11*(1), 98. https://doi.org/10.2307/1602812

Publisher's Note