The duration of family-related employment interruptions - the role of occupational characteristics

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The duration of family-related employment interruptions – the role of occupational characteristics

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Abstract After childbirth, women often interrupt their careers. These interruptions are associated with negative consequences for later employment, which are greatly influenced by the duration of the interruption. We analyse the influence of occupational characteristics on this duration, as occupations are crucially important for career trajectories in Germany. Specifically focusing on occupational sex segregation, the occupational wage level and the share of part-time workers in occupations, we test two competing hypotheses: on the one hand, lower wages in female-dominated occupations should lead to longer employment interruptions due to lower opportunity costs. On the other hand, a higher ratio of part-time workers should lead to shorter interruptions due to better reconciliation between family and work. In addition, we analyse whether the proportion of women in a given occupation influences the duration of employment interruptions. We test these hypotheses using data from the National Educational Panel Study (starting cohort 6), combined with occupational information from the Sample of Integrated Labour Market Biographies and the German Microcensus. We focus on family-related employment interruptions after the birth of the first child between 1992 and 2010. The results of our discrete event history models indicate that higher wages lead to shorter breaks, while the part-time rate and the proportion of women in an occupation have no significant effects.

Die Bedeutung des Berufs für die Dauer von Erwerbsunterbrechungen nach der Geburt des ersten Kindes

Zusammenfassung Nach der Geburt eines Kindes unterbrechen viele Frauen ihre Erwerbstätigkeit. Diese familienbedingten Erwerbspausen führen zu Karrierenachteilen, deren Ausmaß entscheidend von der Dauer der Unterbrechung abhängt. Aufgrund der nachhaltigen Bedeutung des Berufs für den gesamten Erwerbsverlauf in Deutschland untersuchen wir, inwieweit berufliche Merkmale diese Dauer beeinflussen. Dabei konzentrieren wir uns auf den Effekt beruflicher Geschlechtersegregation und die damit einhergehenden Berufsmerkmale Lohnniveau und Teilzeitquote und testen gegenläufige Hypothesen: Einerseits sollte das geringere Lohnniveau in frauendominierten Berufen durch niedrigere Opportunitätskosten zu längeren Erwerbsunterbrechungen führen. Andererseits sollten sich hohe Teilzeitquoten in frauendominierten Berufen aufgrund der besseren Vereinbarkeitsmöglichkeiten verkürzend auf Erwerbsunterbrechungen auswirken. Zudem wird untersucht, ob der Frauenanteil selbst darüber hinaus einen eigenständigen Effekt auf die Unterbrechungsdauer aufweist. Wir testen diese Hypothesen anhand von Daten des Nationalen Bildungspanels (Startkohorte 6), die um berufliche Merkmale be-

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ruhend auf der Stichprobe der Integrierten Arbeitsmarkt-biographien und des Mikrozensus erweitert werden. Wir betrachten dazu Erwerbsunterbrechungen nach der Geburt des ersten Kindes in den Jahren 1992 bis 2010. Anhand von diskreten Ereignisdatenmodellen zeigt sich, dass ein hohes berufliches Lohnniveau die Rückkehr von Müttern auf den Arbeitsmarkt beschleunigt, während der Teilzeitanteil und der Frauenanteil selbst keinen signifikanten Einfluss aufweisen.

1 Introduction

In recent decades, women in the German labour market have become more employment oriented. This has expressed itself both in higher levels of educational achievement and in a continuously growing female employment rate (Helbig 2012; Wanger 2011). But even though the employment behaviour of men and women is converging, especially at the start of their employment careers, after childbirth, men and women still frequently return to a more traditional division of roles (Bühlmann et al. 2010; Dressel et al. 2005; Drobnič et al. 1999; Schulz and Blossfeld 2006). It seems that women, and in particular mothers, still feel a greater responsibility for domestic work and child-raising duties than men. Consequently, after a child is born they interrupt their career more frequently and for longer periods of time than men.

However, these employment interruptions entail negative consequences for mothers' careers: they have a destabilising impact on future career paths (Grunow et al. 2011) and a negative effect on further wage development (Boll 2009; Ondrich et al. 2002; Ziefle 2004, 2009). It is primarily the duration of the interruption that determines how severe these consequences are: the longer the interruption, the worse the career repercussions (Aisenbrey et al. 2009; Boll 2009; Ejrnæs and Kunze 2013; Ondrich et al. 2003; Ruhm 1998; Ziefle 2004).

Previous studies have already identified various key factors that influence the duration of family-related employment interruptions, including the individual characteristics of the mother and contextual factors at the level of firms, institutions and the economy as a whole. However, prior research has largely neglected occupational characteristics. The decision not to include occupations is unfortunate, because occupations have lasting consequences for individuals' entire employment careers, especially in Germany, and play a crucial role in creating and maintaining social stratification (Konietzka 1999; Solga and Konietzka 1999). They can thus be assumed to have a decisive impact on the duration of family-related employment interruptions. This particularly applies to one central and persistent characteristic

of the German occupational structure, namely occupational sex segregation.

This article studies the impact of occupational sex segregation and associated occupational characteristics on women's family-related employment interruptions. Although previous studies included the proportion of women in an occupation as a control variable, they did not examine how it exerts its influence (e. g. Stuth and Hennig 2014; Ziefle 2009; Ziefle and Gangl 2014). This is what our study explores. To understand the influence of occupational sex segregation, we take the share of part-time employees and the occupational wage level into consideration and explore whether the ostensibly family-friendly working hour arrangements in female-dominated occupations allow mothers to return to work more quickly or whether the low wage levels in female-dominated occupations result in longer interruptions due to lower earning losses. Moreover, we examine the sole effect of the proportion of women on the duration of employment interruptions when controlling for the occupational part-time rate and wage level. To address these concerns, we analyse data of starting cohort 6 (adults) of the National Educational Panel Study (NEPS), which is supplemented with occupational information based on the Sample of Integrated Labour Market Biographies (SIAB) and the German Microcensus.

The following section summarises the research on family-related employment interruptions and the determinants of their duration. The third section describes the role of occupations in the German labour market and outlines the theoretical framework. Sect. 4 describes the data, variables and methodological design followed by Sect. 5, which presents the results, and Sect. 6, which draws the final conclusion.

2 Family-related employment interruptions and factors influencing their duration

Although policy measures have increasingly sought to support a more equal distribution of childcare tasks between mothers and fathers in recent years, it is still predominantly women who interrupt their careers to care for children (Statistisches Bundesamt 2015). In a new parental leave regulation introduced in 2007, a specific portion of leave was reserved exclusively for partners. This did lead to a significant increase in men taking such leave: before this new regulation, only 1–3% of fathers took parental leave (Pollmann-Schult and Wagner 2014, p. 21), whereas 18% of fathers with children born in 2007 took some parental leave (Trappe 2013, p. 240). This number continued to rise in subsequent years, reaching 27% for children born in 2011 (Trappe 2013, p. 240). But women still account for the biggest share of parental leave and men typically only take the two additional parental leave months reserved for

partners, which are therefore often called "daddy months" (Statistisches Bundesamt 2015).[1]

Various empirical studies have supported the finding that family-related employment interruptions have lasting negative career consequences. The severity of these negative consequences depends greatly on the length of the interruption (Aisenbrey et al. 2009; Beblo and Wolf 2003; Boll 2011; Ondrich et al. 2003; Ruhm 1998; Waldfogel 1998; Ziefle 2004). For example, several studies detect a negative impact on wage development following the birth of a child (Ondrich et al. 2003; Schmelzer et al. 2015; Ziefle 2004). In addition to these monetary losses, especially long interruptions also have a destabilising effect on subsequent employment careers (Aisenbrey et al. 2009; Grunow et al. 2011).

Breaks that last longer than the statutory leave period entail particular risks, because the protection against dismissal that comes as part of statutory parental leave counteracts the potentially negative consequences of the interruption (Grunow et al. 2011). This job protection during leave has a positive effect on women's labour force attachment (John and Stutzer 2002) and allows mothers to "continue their previous career and reap the full benefits of their investment in education […]" (Grunow et al. 2011, p. 426). Ziefle (2004) shows for Germany that returning to the previous employer on average compensates for the wage-related career disadvantages associated with a one-year employment interruption. In this sense, government regulations have a crucial influence on the decision about how long women interrupt their careers (Aisenbrey et al. 2009; Drasch 2012; Gottschall and Bird 2003; Ondrich et al. 1996, 2003; Schönberg and Ludsteck 2007; Ziefle 2009; Ziefle and Gangl 2014). The longer the statutory parental leave period, the longer the mothers' employment interruptions (Grunow et al. 2011; Ruhm 1998; Ziefle and Gangl 2014). Another condition created by family policy is the availability of public childcare which supports the labour force attachment of mothers and facilitates the return to work (Grunow and Müller 2012; Büchel and Spieß 2002).

In addition to family policy measures, there are other structural factors that influence the duration of women's employment interruptions, e.g. the unemployment rate (Grunow and Müller 2012; Weber 2004) and cultural factors, such as attitudes towards maternal employment transmitted through socialisation. The role of socialisation is reflected in the different return behaviour exhibited by mothers in East and West Germany and by those who moved from East to West (Grunow and Müller 2012).

Apart from that, factors relating to the specific employment context, such as firm size, have a relevant influence on employment interruption durations (Frodermann et al. 2013; Weber 2004) as do individual factors and household characteristics. For example, better-educated women return to the labour market more quickly (Bredtmann et al. 2009; Drasch 2013; Grunow et al. 2011), whereas married women and women with alternative sources of income or more extensive household resources take longer breaks (Ondrich et al. 1996; Weber 2004). The mothers' age at childbirth has a u-shaped relationship with the probability of returning (Ondrich et al. 1996). The employment experience gathered before the child is born accelerates the return to the labour market (Gustafsson et al. 1996).

Although extensive research has been conducted on the factors that influence the duration of family-related employment breaks, a key structural characteristic of the German labour market has been neglected so far: the occupation. Only few previous empirical studies have taken occupations into consideration (Krüger et al. 1989; Stuth and Hennig 2014; Stuth et al. 2009), but those that have done so have always identified it as an important influencing factor. For example, Krüger et al. (1989) analysed how occupational cultures and structures affecting work-family reconciliation influence the duration of women's employment interruptions and their return to work in five occupations. They found that women in occupations with high part-time rates and/or flexible working hour arrangements, in this case commercial and administrative employees, returned to work more frequently than women in manual, physical jobs such as hairdressers (Krüger et al. 1989). Looking at data for 2006 and including a much larger range of occupations (111 occupations), Stuth et al. (2009) come to similar conclusions: occupations requiring long weekly hours display longer employment breaks, whereas flexible working hour models promote women's return into gainful employment. Building on this, Stuth and Hennig (2014) conducted a study for the year 2007, in which they also established the importance of the signalling function of occupations (measured by the specificity of an occupation) and occupational closure (licensing, legal protection of the activity and credentialing educational heterogeneity) as well as whether the occupation was typically found in a structured or unstructured labour market (employee turnover, etc.) for the length of interruptions (Stuth and Hennig 2014). The two latter studies point to the importance of the occupation as a context that sets opportunities and constraints, within which the conditions for employment interruptions and possibilities for re-entry are structured.

Overall, the current research underlines the relevance of the occupation an individual had before parental leave.

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[1] For example, parental benefit was paid to 32% of fathers but to 96% of mothers for all children born in 2013 (Federal Statistical Office 2015, p. 26). Moreover, most women (92%) received parental benefit for a period of 10–12 months, whereas the majority of men received benefit for only one to two months (Statistisches Bundesamt 2015, p. 7).

However, they only look at a small number of occupations, a few years or focus on a specific group. The two most recent studies (Stuth and Hennig 2014; Stuth et al. 2009), for example, concentrate exclusively on a selected group of women, i. e. late re-entrants, who have already exceeded the statutory parental leave period and thus no longer benefit from the associated statutory job protection. For instance, Stuth and Hennig (2014) focus on the occupational characteristics that guide employers' recruitment decisions e. g. occupational closure or the specificity of an occupation, which functions as a signal for employers. In contrast, our goal is to investigate the relevance of occupational characteristics as factors that either encourage or inhibit female employees in their decisions and actions. For this purpose, we examine women immediately after a child is born, that is during the statutory leave period, when they still enjoy job protection, as the decision to return to work is made primarily by the mothers themselves during this time.

The present study centres on this decision and analyses to what extent it is shaped by occupational characteristics. For this purpose, we have obtained data on the structural characteristics of more than 250 occupations over a time span of 19 years (1992 to 2010). Subsequently, we will discuss how occupational characteristics might impact the individual decision to return to the labour market after a family-related employment interruption. To this end, we will start by describing the importance of occupations on the German labour market and continue by taking a theoretical look at the phenomenon of occupational sex segregation and its impact on the duration of employment interruptions.

3 Theoretical background and hypotheses

3.1 Occupation and occupational sex segregation in the German labour market

Occupations can be described as "institutionalised structures that define a job in terms of its contents, differentiate and structure it" (Brater 2010, p. 805). They are specialisations that arise as part of the division of labour and take the form of bundles of skills learned in education or training (Sackmann and Rasztar 1998, p. 26). At the general societal level, occupations thus have the function of assigning workers to jobs (Abraham et al. 2011), and thereby contribute to social stratification (Weber 1972).

Especially in the German labour market, an individual's occupation has a lasting impact on the entire life course and career trajectory. Through the dual vocational training system, occupations closely link the education system to the labour market (Solga and Konietzka 1999). Even tertiary education in Germany has a strong occupational focus (Leuze 2010). Accordingly, labour market entry is charac-

terised by a high skills and status match between the apprenticeship a person completes and her first job (Konietzka 1999; Solga and Konietzka 1999). Therefore, changing occupation increases downward mobility if an individual does not hold the necessary credentials (Konietzka 1999). Overall, switching occupation entails the loss of occupation-specific human capital, resulting, for example, in wage penalties (Mertens 1997) and discontinuous earning trajectories (Hacket 2009). Accordingly, occupational mobility is low in Germany (Allmendinger and Hinz 1997).

In fact, to highlight their great importance for both the German labour market and individual action, occupations could be understood as institutions (Stuth et al. 2009; Abraham et al. 2011). This means that occupations represent institutionalised rules that "harmonise and coordinate qualifications and job requirements" (Abraham et al. 2011, p. 6). This reduces uncertainty between employer and employee in the labour market and thus facilitates the matching process (Abraham et al. 2011). In this context, the occupational title not only signals that the bearer has a specific skills profile; it also signals specific norms and values that are communicated during vocational education. The rules of the occupation limit an occupation member's scope of action and influences his decisions (Stuth et al. 2009). Hence, occupations fulfil another central property of institutions: they define and limit the set of choices of individuals (North 1998, p. 4). Applying this to (family-related) employment interruptions, this means that not only the different standards and rules implicit in an occupation, but also the associated institutionally regulated requirements and conditions may promote or impede women's return to the labour market (Stuth et al. 2009). Hence, occupations and occupational characteristics should influence the decision to return to the labour market in different ways.

Employees are not randomly distributed among different occupations; instead it emerges that "decisions to choose an occupation [are] structured socially, i. e. they are influenced by social categories such as gender and social background" (Abraham et al. 2011, p. 1). In particular, the unequal distribution of men and women across different occupations is a persistent and characteristic feature of the German labour market[2] that has changed only marginally over the past 35 years despite the increase in the female employment rate (Hausmann and Kleinert 2014).[3] Occupational sex segregation is systematically linked to different opportunities and conditions in the labour market (Achatz et al. 2005; Anker

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[2] Occupational sex segregation is an international phenomenon that is not limited to the German labour market (Charles and Grusky 2004).

[3] The reasons why occupational sex segregation arises and persists can be explained by both the different occupational selection behaviour of men and women and employer-related processes of personnel selection and discrimination (Achatz 2008).

1997; Busch 2013; Falk 2005; Liebeskind 2004; Leuze and Strauß 2016). This is illustrated by the fact that employees in occupations with a high proportion of women are confronted with lower wages, fewer promotion opportunities and higher part-time rates (Binder 2007; Busch and Holst 2009; Liebeskind 2004). The theory of compensating differentials suggests a direct relationship between these factors: according to the theory, women systematically choose occupations with higher part-time rates so that they can better combine job and family, in turn accepting lower wages in these occupations (Becker 1985; Filer 1985). However, the assumption that more family-friendly working hours compensate for lower wages in women's occupations is highly contested in literature (Budig and England 2001 u. a.; Glauber 2011, 2012; Jacobs and Steinberg 1990).

3.2 The impact of occupational sex segregation on the duration of family-related employment interruptions

What incentives and limits do these occupational characteristics set regarding the ability to reconcile job and family following the birth of a child? Numerous studies show that occupations with higher proportions of women also pay lower wages than male-dominated occupations (for Germany see e.g. Achatz et al. 2005; Busch and Holst 2013; Hinz and Gartner 2005). The wage level in an occupation reflects the general income prospects it offers. Based on the economic theory of labour supply (Franz 2003; Killingsworth and Heckman 1986; Blau et al. 2010), these income prospects should have a direct influence on mothers' employment decisions. According to this theory, the decision to offer one's labour is based on an individual cost-benefit consideration: individuals compare the value of their time invested in the labour market to the value of time spent at home, for example, free time, time for domestic work or child-raising. Consequently, an individual will choose to participate in the labour market if this generates a greater value (Blau et al. 2010). Accordingly, with regard to family-related career breaks, mothers should return to the labour market if this allows them to generate a greater benefit than continuing the employment interruption would.

The benefit of labour market participation is not only influenced by the wage received before the employment interruption[4], but in particular by the wage a person can expect to earn by returning to the labour market. The higher this expected wage is, the sooner a mother is expected to return to work after childbirth (Ziefle and Gangl 2014). Especially in Germany, the expected wage depends heavily on the income prospects of an occupation, that is, on the

average wage level in an occupation. The same holds true for the opportunity costs of an employment interruption, which refers to the loss of wages due to non-employment. The higher the potential income and thus the potential opportunity costs, the more likely it is that mothers should return to work. Accordingly, a lower wage level, as is typical in occupations dominated by women, is expected to reduce mothers' propensity to return to work. After all, mothers in these occupations not only have less to lose from an interruption; they also have less to gain by returning to the labour market. These considerations lead to our first hypothesis:

H1.   The lower the wage level in an occupation, the slower women will return to the labour market after a family-related employment interruption.

In addition to wages, working hour arrangements are also related to the gender composition of an occupation. In occupations with a high proportion of men, working overtime, constant availability and business trips are standard requirements (Crompton and Lyonette 2011; Busch 2013; Leuze and Strauß 2016; Williams 2000), whereas working part-time is associated with insecure employment and is considered harmful to the career (Busch 2013). In contrast "many female-dominated occupations are conceived as part-time jobs" (Busch 2013, p. 280) allowing women to reconcile gainful employment and family obligations. Accordingly, occupations with a high proportion of women have higher rates of part-time employees (Binder 2007). The part-time rate in an occupation is an indicator of the ability to reconcile work and family or of whether an occupation is generally suitable for working part-time.[5] The option to be employed on a part-time basis should provide for a quicker return to the labour market. Therefore, our second hypothesis says:

H2.   The higher the part-time rate in an occupation, the faster women will return to the labour market after a family-related employment interruption.

While the part-time rate of an occupation addresses concrete options to achieve work-family balance, the proportion of women itself can reflect the social acceptance of violating male-influenced, traditional employment histories and work standards (Williams 2000). Usually, it is still women who take a break from gainful employment after a child is born (Statistisches Bundesamt 2015). Accordingly, employees in occupations dominated by women,

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[4] This is approximated in our analyses based on the educational level and the employment experience of the mother.

[5] Returning to work part-time for an employer, who employs more than 15 employees, is assured by the German law on part-time work and limited term employment act (Section 8 TzBfG). However, the proportion of part-time employees in the occupation shows to what extent it is actually common and feasible in the daily work routine to work part-time in an occupation.

where a lot of people are working who anticipate employment interruptions themselves, should show solidarity towards mothers, encourage them to use such work-life policies and support them when they return to work (Blair-Loy and Wharton 2002).

The proportion of women in an occupation also increases the occurrence of work-family conflicts resulting from the dual socialisation ("doppelte Vergesellschaftung", Becker-Schmidt 2008, p. 66) of women into the worlds of gainful employment and family. The standard of the "ideal worker" (Williams 2000) is challenged more in occupations with a high proportion of women, because absolute dedication to the job, non-stop employment, all-time availability and employee flexibility are based on access to family work, which men tend to have and women usually do not (Williams 2000). A lot of women therefore find it impossible to concentrate on employment alone (Cech and Blair-Loy 2014).

Against this background, a high proportion of women in an occupation should signal an occupation and work culture where the dedication of a (male) "ideal worker" is not taken for granted, and deviations from this standard are punished less severely regardless of the wage structure and the possibilities to reconcile work and family in this occupation. The pressure to return quickly to the workplace is hence lower, leading to the following hypothesis:

H3. The higher the proportion of women in an occupation, the slower women will return to the labour market after a family-related employment interruption.

Besides the mechanisms discussed here, which lead occupational characteristics to have a direct impact on mothers' decisions to return to work, self-selection effects that operate for specific groups of women in different occupations could also drive the different lengths of the motherhood breaks observed in different occupations. For example, family-oriented women might systematically choose occupations dominated by women, whereas career-oriented women may tend to opt for male-dominated occupations. If that was the case, different interruption behaviours by women in occupations dominated by men or women would not necessarily be a result of the different characteristics of these occupations, such as the wage level or part-time rate, but instead be the result of mothers' personality traits and attitudes. However, previous research challenges whether job selection processes are actually influenced by family-related attitudes and expectations. For example, Hakim (2002) does not find any connection between women's preferences for family or employment and the selection of female- or male-dominated occupations. Ochsenfeld (2016) among others finds no indication that university subject choice is determined by the anticipation of gendered family roles (see also Lörz and Schindler 2011). Additionally, research has shown that actual occupational changes in the context

of starting a family are not necessarily based on the gender composition of the occupations (Trappe and Rosenfeld 2004) and that occupations dominated by women have a similar probability of being populated by women with and without children (Roos 1985). On the whole, the empirical results suggest that family-oriented and career-oriented women do not necessarily choose occupations with a different proportion of women. This supports the assumption that the occupational characteristics described above represent incentives or impediments to resuming gainful employment and that different interruption periods from different occupations are not preferentially based on self-selection.

4 Data, variables and statistical modelling

4.1 Data description

The data used in this study consists of the first wave of starting cohort 6 (adults) of the National Educational Panel Study (NEPS).[6] This survey contains retrospective information on the life course of 11,649 persons born between 1944 and 1986. The respondents stated their education and employment history on a monthly basis and also reported any periods of unemployment or parental leave (Blossfeld et al. 2011). To analyse the duration of family-related employment interruptions, the data set is initially restricted to women who have had at least one child. Moreover, we focus on women who are closely attached to the labour market to counteract distortions caused by heterogeneous employment inclinations and thus to absorb possible selection effects. Consequently, the sample consists of women who had been employed without any interruption for at least 15 h per week[7] for a minimum of six months before their first child was born and whose last job ended within six months prior to giving birth. Furthermore, we restrict our analysis to mothers who had their first child between

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[6] This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort Adults, doi:10.5157/NEPS:SC6:1.0.0. From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

[7] We chose this hour limit in accordance with the Federal Employment Agency (BA). A person who works 15 h a week is not classified as job seeking or unemployed according to the BA. At the same time, this number of hours is the lower limit for employment subject to social insurance contributions (on this matter see Drasch 2012).

1992 and 2010[8] in West Germany[9]. During this time span, one aspect of parental leave regulation central to our study, namely job protection during leave, did not change and was consistently at 36 months (Drasch 2012).[10]

For our analysis, we supplemented the individual life course data from the NEPS with data on the occupational level. For this purpose, an occupational panel data set, named "OccPan", is used, which was created on the basis of the Sample of Integrated Labour Market Biographies (SIAB) (vom Berge et al. 2013).[11] The SIAB data represent a 2% sample of the Integrated Employment Biographies (IEB), process-generated data of the Institute for Employment Research (IAB) of the Federal Employment Agency (BA). This data is based on the annual mandatory notifications by employers to the social security agencies and provides exact daily information on the employment status of all employees in Germany who are covered by social security.[12] This reliable individual data is used to aggregate annual information, such as the proportion of women or the average wage level at the occupational level. The final panel comprises occupational characteristics for 254 different occupations per year (for a detailed documentation of the generation of the occupation panel "OccPan", see Hausmann et al. (2015)). Finally, this data basis was further supplemented by central, occupational level characteristics from the German Microcensus (1991 to 2010)[13] to increase the informational value of the data. Thus, aggregated information on working hours in different occupations are added based on the Microcensus.

4.2 Methodological approach

To study the impact of occupational sex segregation and associated occupational characteristics on the duration of women's employment interruptions after their first child is born, we employ event history analysis. The relevant event is the resuming of employment by the mother, which marks the end of the employment interruption. Event history analysis makes it possible to calculate the probability of occurrence of the event, which is, the return to the labour market, by considering the time that has already passed.

One advantage of this type of analysis is that it allows us to include (right) censored observations (Allison 1982). Accordingly, the analysis also includes mothers whose employment interruption has not yet ended by returning to the labour market. The method moreover enables the use of time-varying independent variables. Consequently, when external circumstances or living conditions at the start of the interruption episode change over the course of the employment break, e. g. the childcare enrolment rate, this can be taken into consideration.

The individual level data of the NEPS is recorded on a monthly basis, which justifies the use of event models for discrete time units (Singer and Willett 2003). In real life, the return to work after a family-related employment interruption can take place at any time during a month (BMFSFJ 2012).[14] Accordingly, it is a process that was recorded discretely, but happens continuously. For this case, Singer and Willett (2003) recommend the usage of a complementary log-log model.[15] In the logistic regression, the odds ratios represent the ratio of the odds of event occurrence in one group to the odds of event occurrence in another group (Singer and Willett 2003). In the complementary log-logis-

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[8] Thus, we also include births near the end of our observation period. To ensure that this does not generate distortions, we also calculated models that only include births from 1992 to 2007. Accordingly, these models exclude 85 employment interruptions that started after 2007 and resulted in 28 returns to work. This model specification yields comparable results.

[9] Studies by Drasch (2012) and Grunow and Müller (2012) show, the interruption periods following the birth of a child differ systematically between mothers in East and West Germany. This can be explained both by cultural (attitude, socialisation) and structural (child-care infrastructure) differences between East and West Germany. In addition, the dimension and consequences of occupational sex segregation also differ between the old and new federal states (Falk 2005; Busch 2013; Trappe 2006). This supports the strategy of observing the two parts of the country separately. Due to problems with case numbers, the present analysis could, however, not be conducted for East Germany. This is because the NEPS comprises fewer East German women ($N = 110$) that match our sample definition. Also, due to the low case numbers, the Microcensus does not allow us to depict the occupational characteristics for East Germany as finely as for West Germany. Accordingly, this study focuses on West Germany.

[10] In 1991, the protected leave ended after 18 months. For children born from 2007 onwards, a new parental benefit regulation applies. The benefit is now earnings-related at a replacement rate of 67% of net earnings between the minimum benefit of 300 €/month and the benefit cap of 1800 €/month for parents employed pre-birth (Ziefle and Gangl 2014, p. 565). Moreover, a couple where both partners take parental leave receives parental benefits for two additional months. The 36-month job-protection period is not affected. Among others, BMFSFJ (2012), Drasch (2012) and Ziefle and Gangl (2014) give an overview of the respective statutory regulations.

[11] The data basis of the occupation panel is the weakly anonymised Sample of Integrated Labour Market Biographies (version 1975–2010). The data record is available through the Research Data Centre (FDZ) of the Federal Employment Agency in the Institute for Employment Research. For more information on the data and on data access, see the FDZ websites: http://fdz.iab.de/.

[12] Civil servants and self-employed persons are not included in the data.

[13] For study years such as 1992, in which no Microcensus data were collected, the occupational characteristics were generated by manual imputation (for details, see the methods report by Leuze & Faas (due for publication in 2017)).

[14] This is the case as the calculation of the parental leave entitlement refers to the child's date of birth. So the return to the workplace does not necessarily fall on the start of a month (BMFSFJ 2012).

[15] To verify the robustness of our results, we additionally estimated event history models with a logistic function. They deliver comparable results.

tic regression, in contrast, the odds ratios express the ratio of the hazard rates, this means the ratio of the conditional probabilities (Lois and Kopp 2009). These models specify the probability that an event occurs at the time t on condition that the event has not yet occurred at the time t–1. The regression equation thus is: $\text{clog} - \log h(t_i) \equiv \log[-\log(1 - h(t_i))] = \alpha_t + \beta' x_{it} + \gamma' z_i$ (following Allison 1982, p. 72).

Where β' represents the regression coefficient of the time-varying independent variable x for individual i at time t. Analogously, γ' stands for the regression coefficient of the time-constant variable z of individual i. The time dependence is modelled by dichotomous variables α_t, which represent time intervals that cover the time since child birth. The definition of these intervals is based on empirically observed limits and takes the parental leave regulation into account.[16]

As there are multiple observations available for each individual due to the person-month structure of the data, robust standard errors are calculated.[17] The results show average marginal effects (AME). They indicate the average influence of the independent variable on the probability of event occurrence (Mood 2010; Wolf and Best 2010).

4.3 Operationalisation

The dependent variable in our study is a dichotomous variable that specifies for each individual and month of observation whether a woman has returned to the labour market (1) or not (0). We restrict our analysis to the birth of the first child, because this event is considered decisive for the further life and career trajectory (and any additional births). Therefore, our observation begins in the month the first child is born or in the first month of parental leave[18]. Taking up employment of at least 15 h a week is considered as return to the labour market. If a woman has not returned to the labour market after 72 months or if a second child is born, the episodes are right censored.[19] The decision to right censor after 72 months is based on our research question, as our aim is to analyse the influence of occupational characteristics on the mothers' individual decision to return.[20] The later a mother returns (or if the mother returns after the end of the statutory job-protection period), the more this decision also depends on the employer. Moreover, it can be assumed that the effects of the characteristics of the pre-parental-leave occupation decrease over time or that other factors are decisive for the decision to return after a period of more than six years.

Our central independent variables are the *proportion of women*, the *part-time rate* and the *occupational wage level* of the reference occupation, that is the occupation the woman worked in immediately before interrupting employment.[21] Based on the SIAB data, the proportion of women states the percentage of women among all employees by occupation and by year. Accordingly, the variable may take on values between 0 and 1, where 1 means that 100% of the incumbents in this occupation are women, whereas a value of 0 means that not a single woman is working in this occupation. For the descriptive observations, we put this variable into three categories based on Trappe (2006): Female-dominated occupations are occupations with a proportion of women of at least 70%. The proportion of women in male-dominated occupations can be 30% at the most, and the percentage of women in integrated occupations can range between 30 and 70%. The *proportion of part-time employees* was calculated on the basis of the Microcensus and states the percentage of employees (women and men) who work up to 20 h a week[22]. This variable also ranges from 0 to 1. Based on the SIAB data, moreover the average *daily wage*[23] of the full-time employees of an occupation was calculated.[24]

The selection of our *control variables* is based on the results of previous research (see Sect. 2). Accordingly, we include marital status (married vs. unmarried) as an indica-

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[16] The periods end after month 1, 6, 12, 24 and after month 36, the end of the job-protection period. Month 12 and 24 mark regulations on parental benefit and parental leave from 2001. In 2001, the *2 + 1 rule* was introduced which allows a parent to take the third year of parental leave at a later date (until the child's eighth birthday) (Drasch 2013). Also, a short interruption of 12 months was rewarded with higher parental benefit payments (Ziefle and Gangl 2014).

[17] Moreover, the use of multi-level models accounts for the fact that the observed women are partly clustered on the same occupations. Using the multi-level models, we obtain comparable results. Due to the fact that these multi-level models also show that only a small part of the variance falls to the occupational level (depending on the model, ϱ is between 0.02 and 0.03), we decided against this type of result presentation.

[18] There are only eight mothers who start their parental leave period later than 12 months after the child is born. These mothers enter our analyses as mothers without interruptions after childbirth. Interruptions that start much later may be due to special factors of an occupational or family-related nature that could distort our analysis.

[19] The transition from an employment interruption or a period of parental leave into education or unemployment is considered as a continuing employment interruption. The mother "stays at risk" of returning. However, if the educational episode or another status lasts for more than three months, the observation is censored. These mothers have thus not returned and are no longer part of our "risk set".

[20] As a further robustness check, we estimated models in which censoring took place after 4 or 5 years. These models yield similar results.

[21] Overall, the observed women worked in 118 different occupations.

[22] Modelling the part-time rate as a percentage of employees who work up to 34 h a week delivers comparable results.

[23] As a further check of the robustness of our results, we modelled the median daily wage, which returned the same results.

[24] As the SIAB data provides no information on working hours, we cannot calculate hourly wages from the daily wages. To avoid distortions, only the daily wages of the full-time employees will be considered.

tor of alternative sources of income. In previous studies, the level of education has additionally turned out to be a key influencing factor (Drasch 2013), which is why we take into account the highest educational qualification at the time the child is born. As the data we use here are retrospective, they do not include individual-level information on mothers' attitudes and personality traits. Therefore, we use the level of educational achievement to capture possible selection effects with regard to the mothers' career orientation. If specific personality traits actually cause self-selection in female-dominated occupations and longer employment interruptions, we would also have to assume that these women already based their educational decision systematically on their family orientation, which could be controlled for by taking the level of educational qualification into account. We differentiate the educational groups according to the CASMIN classification scheme and create three categories: mothers without vocational qualification, with vocational qualification and university/university of applied sciences degree.[25] Additionally, mothers' previous employment experience is included.[26] The level of the educational qualification and mothers' previous employment experience also serve as an indicator of the individual wage before the employment interruption. To take any differences in socialisation into consideration, we also control for whether the mother has a migration background (at least one parent or the person herself was born abroad). Moreover, a time-varying variable is used to factor in whether mothers become pregnant again during the interruption.[27]

At the individual level, we also control for characteristics of the pre-leave job. For this, we consider whether the woman held a management position prior to child birth. This also allows us to address women's career orientations. Moreover, we identify mothers who worked in the civil service before the interruption, as this is indicative of working conditions and should thus influence the speed of return. A final characteristic of the previous job that is included is whether the respondents had been employed for less than 20 h a week before the child was born. This piece of information maps the possibility of returning to the previous job in part-time without reducing the working hours and can

additionally serve as an indicator of the woman's employment orientation.

As described above, the parental leave regulations have a significant impact on the mothers' speed of returning to the labour market. Although the duration of job protection remained constant across our analysis sample, there was a change in the parental leave regulation during the observation period: from the year 2007, couples who divided child-care duties were rewarded, i. e. couples where both partners take parental leave were given two extra months of parental leave. Furthermore, the period for receiving parental benefit was reduced to 12 or 14 months and it was changed into a wage-dependent benefit (BMFSFJ 2012). To map these changes, we control whether the first child was born before 2007. Finally, the childcare rate for children under the age of three by federal state is also included in the models as a time-varying control variable, since the availability of (public) external childcare is often necessary for the mother to return to the labour market.[28] Table 2 in the Appendix gives an overview of the distribution of the variables used.

5 Results

5.1 Descriptive results on the duration of family-related employment interruptions

In a first step, we conduct a descriptive analysis of whether we can determine any impact of the proportion of women in the occupation held prior to giving birth on the length of the employment interruption. For this purpose, we analyse mothers' return to the labour market using Kaplan-Meier estimates separately for female-dominated, male-dominated and integrated occupations. Fig. 1 shows the months of employment interruption on the X-axis, while the Y-axis depicts the proportion of women who return to the labour market in month X, that is, those who start to work at least 15 h a week. The calculation of the proportion is based on the number of all mothers who are still *at risk* at this point, meaning that they have neither returned to the labour market nor have they been right censored. The Kaplan-Meier failure function depicts the proportion of women that return to the labour market for every month after the first child was born. The graph thus shows the accumulated proportion of returners.

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[25] Models that account for an interaction effect between the mother's level of educational achievement and the proportion of women in the occupation deliver comparable results. As the interaction effect does not show any significant impact, the more parsimonious model is chosen.

[26] It is mapped through the sum of all months of employment prior to the birth of the first child weighted by working hours. For this, only employment experiences outside of an educational context are considered.

[27] We use a dummy variable for this purpose, which takes on the value of 1 six months before the birth of the second child, as we can assume that women are aware that they are pregnant at this stage and that the pregnancy influences their decision to return accordingly.

[28] In 2002 the administrative measure of childcare was changed. The childcare rate used to depict the available supply of public childcare for certain age groups. From 2002 onwards the childcare rate measures the actual use of childcare facilities. Therefore there is no administrative data available to represent the childcare rate in the selected period from 1992 to 2010 consistently. We would like to thank Dana Müller (FDZ of the BA in the IAB) who calculated a consistent childcare rate based on the Microcensus data and made it available to us.

Fig. 1 Kaplan-Meier failure estimate for returning to the labour market after the first child is born (Source: NEPS 1.0.0 2011, SIAB weakly anonymous version 7510 & Microcensus, own calculations, $N = 1073$)
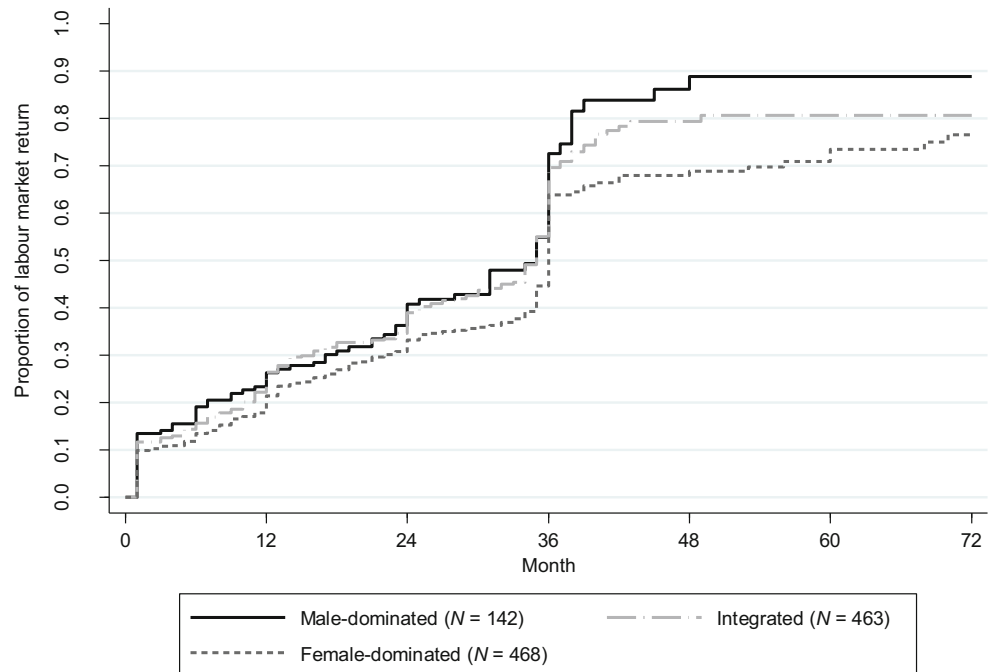

Fig. 1 shows the importance of statutory parental leave regulations, as most returns take place during the first three years of parental leave. In month 36 of the employment interruption we see a distinct step: Almost 20% of the mothers who have not returned by then re-enter employment in this month. The occupation only becomes relevant after the end of the statutory parental leave period. From this point, we observe significant differences in the return behaviour of women who had previously worked in a male-dominated occupation compared to women who had worked in an occupation dominated by women.[29] On the whole, women from male-dominated occupations return to the labour market more quickly and in a greater proportion than women from female-dominated occupations. Women who had worked in integrated occupations before the birth of the first child are in the middle.

This descriptive finding can be interpreted as a first hint regarding hypothesis 3. According to this hypothesis, mothers from female-dominated occupations are expected to interrupt for longer periods, because longer employment interruptions are better accepted due to the working culture in female-dominated occupations compared to male-dominated occupations, where there is a greater pressure to return quickly. However, the Kaplan-Meier failure function cannot answer the question whether the lower speed of return to the labour market of mothers from female-dominated occupations is in fact due to the high percentage of women in these occupations and the associated occupational culture. The observed pattern could also be caused by lower wage levels in female-dominated occupations and hence by lower opportunity costs of interrupting employment, as stated in hypothesis 1. The poorer income prospects in occupations dominated by women could also reduce women's propensity to return. These descriptive findings do not initially seem to support the suggestion put forward in hypothesis 2, namely that high part-time rates in female-dominated occupations motivate women to return to the labour market more quickly. How the three different mechanisms, namely the proportion of women, the wage level and the part-time rate actually interact will be analysed in the following section using multivariate models that also take the control variables into account.

5.2 Multivariate results on the duration of family-related employment interruptions

To investigate the influence of occupational sex segregation and of the associated occupational characteristics – i. e. the wage level and part-time rate – we calculate four multivariate models. The dependent variable represents the dichotomous variable of returning to the labour market. All models account for the duration of the interruption and the mother's individual traits, characteristics of her pre-leave job and influences at the overall society level (childcare rate and parental leave regulations) (the initial model without occupational characteristics is provided in the Appendix,

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[29] The significance of the differences becomes evident when we use confidence bands. Fig. 2 in the Appendix includes a representation of the Kaplan-Meier failure function for female- and male-dominated occupations, including confidence bands. For reasons of clarity, we did not include the confidence intervals in Fig. 1.

Table 1 Complementary log-log model to estimate the return probability. (Source: NEPS 1.0.0 2011, SIAB weakly anonymous version 7510 & Microcensus, own calculations)

Covariate	Model 1 AME	Model 2 AME	Model 3 AME	Model 4 AME
Proportion of women in pre-leave occupation	–0.011** (0.003)	–0.012+ (0.007)	–0.005 (0.005)	–0.007 (0.008)
Part-time rate in pre-leave occupation	–	0.005 (0.027)	–	0.009 (0.028)
Average daily wage (FT) in pre-leave occupation (in hundred thousand)	–	–	0.006* (0.003)	0.006* (0.003)
Time interval				
0–1 month	–0.053*** (0.005)	–0.053*** (0.005)	–0.062*** (0.007)	–0.062*** (0.007)
2–6 months	–0.091*** (0.006)	–0.091*** (0.006)	–0.100*** (0.008)	–0.100*** (0.008)
7–12 months	–0.076*** (0.005)	–0.076*** (0.005)	–0.085*** (0.007)	–0.085*** (0.007)
13–24 months	–0.081*** (0.006)	–0.081*** (0.006)	–0.090*** (0.007)	–0.090*** (0.007)
25–36 months	–0.063*** (0.005)	–0.062*** (0.005)	–0.071*** (0.007)	–0.071*** (0.007)
More than 36 months	–0.076*** (0.007)	–0.075*** (0.007)	–0.084*** (0.008)	–0.084*** (0.008)
Control variables				
Employment experience in years	–0.001+ (0.001)	–0.001+ (0.001)	–0.001* (0.001)	–0.001* (0.001)
Employment experience in years, squared	0.000+ (0.000)	0.000+ (0.000)	0.000+ (0.000)	0.000+ (0.000)
Education (reference with vocational training)				
Without vocational training	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)	0.001 (0.003)
University/university of applied sciences degree	0.009*** (0.003)	0.009*** (0.003)	0.007* (0.003)	0.007* (0.003)
Migration background	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
Married	–0.009*** (0.002)	–0.009*** (0.002)	–0.010*** (0.002)	–0.010*** (0.002)
Pregnant with second child	–0.003 (0.003)	–0.003 (0.003)	–0.003 (0.003)	–0.003 (0.003)
Management position in pre-leave job	0.000 (0.002)	0.000 (0.002)	0.000 (0.002)	0.000 (0.002)
Pre-leave job in public service	0.004* (0.002)	0.004* (0.002)	0.003+ (0.002)	0.003 (0.002)
Part-time work (< 20 h a week) in pre-leave job	0.003 (0.004)	0.003 (0.004)	0.004 (0.004)	0.003 (0.004)
Parental benefit regulation: Born from 2007 onwards	–0.013** (0.005)	–0.013** (0.005)	–0.013** (0.005)	–0.013** (0.005)
Childcare rate (in %)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.001*** (0.000)
N observations	26,186	26,186	26,186	26,186
N persons	1073	1073	1073	1073
N events	560	560	560	560
AIC	5193.3	5195.3	5191.8	5193.6
BIC	5348.6	5358.8	5355.2	5365.3

Average marginal effects, robust standard errors in parentheses

$^+p < 0.1$, $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Based on the variables in model 4, we also estimated a non-proportional hazard model with a complementary log-log function. The coefficients of the explanatory variables are not different from the illustrated model 4 in terms of effect direction and significance

Table 3). We then gradually add the relevant occupational characteristics: model 1 includes the percentage of women in an occupation. Model 2 additionally includes the part-time rate and model 3 the occupational wage level. The final model, model 4, includes all three occupational characteristics. This allows us to investigate which factor has the decisive influence. As explained above, we employ event history models for discrete-time units. The results are shown in Table 1.

Regarding the percentage of women in an occupation, model 1 shows a significant negative effect on the return to the labour market. This means that as the percentage of women in the pre-leave occupation increases, the probability of returning to the labour market decreases or the interruption period after the birth of a child increases. This finding is in line with the result of the Kaplan-Meier estimate and supports hypothesis 3. In the next step, we will investigate whether this connection remains when controlling for the factors associated with a high percentage of women, namely wage level and part-time rate.

Model 2 shows that accounting for the part-time rate in an occupation does not fundamentally affect the relationship observed. Accordingly, the proportion of women still has a negative impact on the mothers' probability of returning, but the effect's level of significance decreases. By contrast, the part-time rate alone does not have any significant impact on returning to the labour market. This contradicts our assumption made in hypothesis 2 that increasing part-time rates in occupations reduce the length of an interruption by offering better options for reconciling work and family. Obviously, high part-time rates in occupations are not sufficient to enable women to re-enter employment quickly following the birth of a child.

But when we include the average wage level of all full-time employees in the respective occupation (model 3) instead of the part-time rate, the significant impact of the proportion of women disappears. Thus, we can no longer determine any effect of the occupational gender composition on the individual probability to return. The wage level, however, has a significant positive impact on the probability of re-entering the labour market. This means the duration of family-related employment interruptions decreases as the average wage in the reference occupation increases. Women in better-paid occupations hence re-enter the labour market more quickly.

We see the same picture in our final model that includes all three occupational characteristics.[30] Here, too, only the

wage level has a significant influence, whereas the percentage of women and the part-time rate make no significant contribution to explaining the probability to return.[31] This points to our first hypothesis: women from occupations with a lower wage level interrupt their employment for longer periods and have a lower probability of returning after their first child is born than women from occupations with better income opportunities. This occupational effect is found regardless of the individual level of educational achievement, previous employment experience and the mother's position before interrupting the employment.[32] In contrast, the percentage of women as a sole indicator of the prevailing working culture in an occupation and the part-time rate as an indicator of the ability to reconcile work and family do not play any role in mothers' decision to return.

6 Discussion and outlook

Female employment careers are characterised by family-related employment interruptions, resulting in lower wages and destabilised career trajectories. Despite the lasting effect that the occupation has on individual's employment trajectories in Germany, it has been neglected in previous studies on family-related employment interruptions. We address this research gap and focus on the impact of occupational sex segregation. In our study, we suggest that a high proportion of women in the pre-leave occupation can have a different impact on the duration of the interruption through the associated factors of wage level and part-time rate. Accordingly, a low wage level in female-dominated occupations could lead to longer employment interruptions due to the poorer income prospects and the associated lower opportunity costs. A high part-time rate in female-dominated occupations, however, should have a positive impact on the propensity to return to the labour market, as it allows women to reconcile work and family more effectively. Moreover, it can be assumed that the proportion of women taken by itself has an influence. Accordingly, there are different cultures and standards of working in female- and in

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[30] Additionally, models were calculated in which only the occupational characteristics and the time dummies were considered. They yield comparable results, but in these models the proportion of women and the part-time rate also have a significant negative or positive influence on the employment interruption.

[31] Besides the depicted models, other models were calculated in which the wage level was centred at the group mean value of the type of occupation (male-dominated, female-dominated and integrated occupation). This models also show a significant effect of the wage level. Furthermore, this model specification reveals a significant effect of the proportion of women. We cannot ultimately determine whether this is also an effect of income or of another unobserved factor that correlates with the proportion of women. The models are available from the authors upon request.

[32] As an additional robustness check, we also calculated a model that includes only the occupational wage level and the part-time rate besides the control variables and disregards the proportion of women in the occupation. This model also backs the results presented here.

male-dominated occupations and this could influence the mothers' pace of re-entering the labour market.

Based on data of the NEPS's adult cohort, we looked at the interruption periods of women who had their first child between 1992 and 2010. To describe the occupational context, we supplemented the individual level data with occupational characteristics drawn from the SIAB and the Microcensus. Kaplan-Meier estimates show descriptively that the probability to return differs depending on the sex composition in the pre-interruption occupation. Accordingly, women from occupations dominated by women returned to the labour market more slowly than women who had been working in a male-dominated occupation before the break. Our multivariate results show, however, that this effect is not due to the proportion of women itself but to the low wage level in occupations with a high percentage of women. In contrast, the impact of the part-time rate is not significant.

Hence, the occupation does indeed influence how quickly women return to the labour market after a family-related employment interruption. This is in spite of the fact that female-dominated occupations do not seem to offer better working conditions in terms of achieving a good work-family balance (part-time rate), but instead provide incentives to prolong the time-out from employment and stay away from the labour market. This is contrary to the basic ideas of compensating differentials. According to this theoretical approach, women should select occupations that offer better options to combine work and family and accept lower wage levels in return (Filer 1985). The relationship between wage level and interruption duration causes the occupational sex segregation in the labour market to affect the individual employment career, creating a disequilibrium between the genders but also between women from occupations dominated by men or women.

The long employment interruptions which are promoted by a pre-leave occupation dominated by women are problematic for individual employment careers and life courses for various reasons: they promote the depreciation of human capital, which can result in a decreased income in later life, and downward occupational mobility and inadequate employment. In the long run, these circumstances may lead to a lower lifetime income and lower pensions for the women in question. But also from a macroeconomic perspective, it is a problem when women interrupt their employment careers for long periods of time and especially if they do not return to the labour market at all. Therefore, it is crucial, especially against the background of an increasing demand for skilled employees in female-dominated occupations such as care-sector occupations, to create stronger incentives for women to resume employment more quickly to counteract the loss of human capital.

Regarding the analyses we presented, it is important to note that the data does not allow for bargaining processes within the relationship to be mapped adequately. Moreover, as discussed in Sect. 3.2, it is possible that women who are less employment-oriented or more family-oriented choose typical, female-dominated occupations. Accordingly, the extended employment interruptions would not necessarily be a consequence of the specific characteristics of these occupations, but rather of the shared personality traits of the women working in these occupations. But we can at least in part control for these potential selection processes by focusing on employment-oriented women in our sample and by considering the educational achievement and the professional position of the mothers prior to the employment interruption. Moreover, it is unclear to what extent family-related attitudes influence job selection in the first place (for choice in field of study e. g. Lörz and Schindler 2011; Ochsenfeld 2016). Regardless of possible selection processes, our results demonstrate that the expected improved work-family balance that female-dominated occupations promise due to higher part-time rates does not seem to be attained or does not provide sufficient incentives for the mothers to return. Better pay in these occupations might provide a more powerful incentive to return to the labour market more quickly.

However, the analysis also has its limitations when it comes to the operationalisation of reconciling work and family. For instance, it is conceivable that the part-time rate does not adequately capture this latent characteristic. Moreover, in addition to examining the length of the interruption it would be interesting to look at the occupation to which the women return, as it is decisive for the impact of the employment interruption. Accordingly, occupational stability is central to resuming the previous career path and counteracting the possible consequences of the employment interruption (Waldfogel 1998). Future studies should therefore also focus on occupational mobility when returning to the labour market.

On the whole, we demonstrate in this study that the characteristics of the pre-leave occupation contribute to the duration of family-related employment interruptions. In previous research, this occupational influence was frequently only accounted for by the gender composition of the pre-leave occupation. But our analyses show that it is not the proportion of women that is the decisive factor, but an associated effect that is hidden behind it. The duration of family-related employment interruptions is not influenced by the proportion of women in the pre-leave occupation but by the associated wage level.

Appendix

Table 2 Distribution of the variables (in person-months). (Source: NEPS 1.0.0 2011, SIAB weakly anonymous version 7510 & Microcensus, own calculations)

| Variable	Percentage/mean	Standard deviation	Minimum	Maximum	N
Return	2.14%	–	0	1	26,186
Time interval 0–1 month	8.20%	–	0	1	26,186
2–6 months	17.93%	–	0	1	26,186
7–12 months	19.59%	–	0	1	26,186
13–24 months	29.92%	–	0	1	26,186
25–36 months	17.41%	–	0	1	26,186
More than 36 months	6.95%	–	0	1	26,186
Occupational characteristics					
Proportion of women in pre-leave occupation	0.64	0.25	0.00	1.00	26,186
Part-time rate in pre-leave occupation	0.14	0.07	0.00	0.51	26,186
Average daily wage of full-time employees in pre-leave occupation	107.07	37.89	40.88	245.78	26,186
Control characteristics					
Education without vocational training	13.84%	–	0	1	26,186
With vocational training	68.94%	–	0	1	26,186
Degree from a university/university of applied sciences	17.22%	–	0	1	26,186
Employment experience in years (weighted by working hours)	8.32	4.19	0.37	29.92	26,186
Migration background	14.30%	–	0	1	26,186
Married	83.60%	–	0	1	26,186
Pregnant with second child	9.72%	–	0	1	26,186
Management position in pre-leave job	29.42%	–	0	1	26,186
Pre-leave job in public service	33.57%	–	0	1	26,186
Part-time work (<20 h a week) in pre-leave job	5.16%	–	0	1	26,186
Parental benefit regulation: Births from 2007 onwards	6.63%	–	0	1	26,186
Childcare rate (in %)	6.37	2.97	3.84	18.58	26,186

Table 3 Complementary log-log model to estimate the return probability – initial model. (Source: NEPS 1.0.0 2011, SIAB weakly anonymous version 7510 & Microcensus, own calculations)

Covariate	Initial model AME
Time interval	
0–1 month	–0.060***
	(0.005)
2–6 months	–0.098***
	(0.006)
7–12 months	–0.084***
	(0.005)
13–24 months	–0.088***
	(0.005)
25–36 months	–0.070***
	(0.005)
More than 36 months	–0.084***
	(0.006)
Control variables	
Employment experience in years	–0.001+
	(0.001)
Employment experience in years, squared	0.000+
	(0.000)
Education	
(reference with vocational training)	
Without vocational training	0.001
	(0.003)
University/university of applied sciences degree	0.012***
	(0.003)
Migration background	0.001
	(0.003)
Married	–0.009***
	(0.002)
Pregnant with second child	–0.003
	(0.003)
Management position in pre-leave job	0.000
	(0.002)
Pre-leave job in public service	0.002
	(0.002)
Part-time work (<20 h a week) in pre-leave job	0.003
	(0.004)
Parental benefit regulation: Births from 2007 onwards	–0.012*
	(0.005)
Childcare rate (in %)	0.001***
	(0.000)
N observations	26,186
N persons	1073
N events	560
AIC	5199.8
BIC	5346.9

Average marginal effects, robust standard errors in parentheses
+$p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Fig. 2 Kaplan-Meier failure estimate for returning to the labour market after the first child is born. Representation of male-dominated and female-dominated occupations (including 95% confidence interval). (Source: NEPS 1.0.0 2011, SIAB weakly anonymous version 7510 & Microcensus, own calculations, $N = 610$)
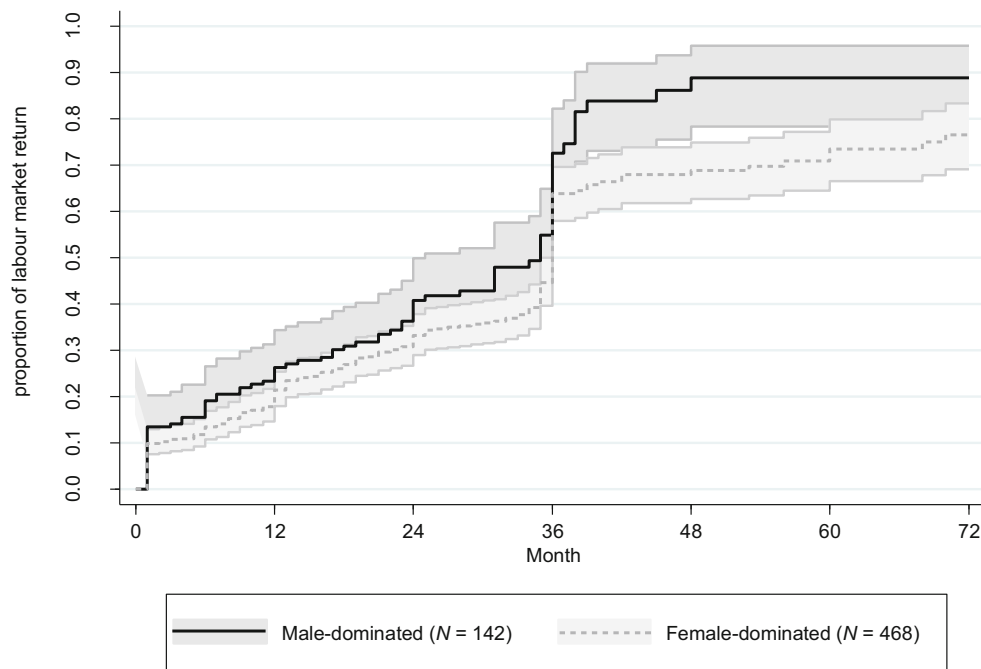
References

Abraham, M., Damelang, A., Schulz, F.: Wie strukturieren Berufe Arbeitsmarktprozesse? Eine institutionentheoretische Skizze. LASER discussion papers, vol. 55. Labor and Socio-Economic Research Center. University of Erlangen-Nuernberg, Erlangen (2011)

Achatz, J.: Geschlechtersegregation im Arbeitsmarkt. In: Abraham, M., Hinz, T. (eds.) Arbeitsmarktsoziologie, pp. 263–301. VS Verlag für Sozialwissenschaften, Wiesbaden (2008)

Achatz, J., Gartner, H., Glück, T.: Bonus oder Bias? Mechanismen geschlechtsspezifischer Entlohnung. Kolner Z Soz Sozpsychol **57**(3), 466–493 (2005)

Aisenbrey, S., Evertsson, M., Grunow, D.: Is there a career penalty for mothers' time out?: A comparison of Germany, Sweden and the United States. Soc Forces **88**(2), 573–605 (2009)

Allison, P.D.: Discrete-time methods for the analysis of event histories. Sociol Methodol **13**, 61–98 (1982)

Allmendinger, J., Hinz, T.: Mobilität und Lebensverlauf: Deutschland, Großbritannien und Schweden im Vergleich. In: Hradil, S., Immerfall, S. (eds.) Die westeuropäischen Gesellschaften im Vergleich, pp. 247–285. VS Verlag für Sozialwissenschaften, Wiesbaden (1997)

Anker, R.: Theories of occupational segregation by sex: An overview. Int Labour Rev **136**(3), 315–339 (1997)

Beblo, M., Wolf, E.: Sind es die Erwerbsunterbrechungen? Ein Erklärungsbeitrag zum Lohnunterschied zwischen Frauen und Männern in Deutschland. MittAB **36**(4), 560–572 (2003)

Becker, G.S.: Human capital, effort, and the sexual division of labor. J Lab Econ **3**(1), 33–58 (1985)

Becker-Schmidt, R.: Doppelte Vergesellschaftung von Frauen: Divergenzen und Brückenschläge zwischen Privat- und Erwerbsleben. In: Becker, R., Kortendiek, B. (eds.) Handbuch Frauen- und Geschlechterforschung: Theorie, Methoden, Empirie, pp. 65–74. VS Verlag für Sozialwissenschaften, Wiesbaden (2008)

Binder, N.: Zwischen Selbstselektion und Diskriminierung. Duncker & Humblot, Berlin (2007)

Blair-Loy, M., Wharton, A.S.: Employees' use of work-family policies and the workplace social context. Soc Forces **80**(3), 813–845 (2002)

Blau, F.D., Ferber, M.A., Winkler, A.E.: The economics of women, men, and work. Prentice Hall, Boston [u. a.] (2010)

Blossfeld, H.-P., Roßbach, H.-G., v. Maurice, J. (eds.): Education as a lifelong process – The German National Educational Panel Study (NEPS) (2011)

BMFSFJ (ed.): Elterngeld und Elternzeit. Das Bundeselterngeld- und Elternzeitgesetz. BMFSFJ, Berlin (2012)

Boll, C.: Lohneinbußen durch geburtsbedingte Erwerbsunterbrechungen – fertilitätstheoretische Einordnung, Quantifizierung auf Basis von SOEP-Daten und familienpolitische Implikationen. SOEPpapers on Multidisciplinary Panel Data Research at DIW Berlin 160. DIW Berlin, Berlin (2009)

Boll, C.: Lohneinbußen von Frauen durch geburtsbedingte Erwerbsunterbrechungen der Schattenpreis von Kindern und dessen mögliche Auswirkungen auf weibliche Spezialisierungsentscheidungen im Haushaltszusammenhang; Eine quantitative Analyse auf Basis von SOEP-Daten. Sozialoekonomische Schriften, vol. 43. Lang, Frankfurt a.M. (2011)

Brater, M.: Berufliche Bildung. In: Böhle, F., Voß, G.G., Wachtler, G. (eds.) Arbeitssoziologie. VS Verlag für Sozialwissenschaften, Wiesbaden (2010)

Bredtmann, J., Kluve, J., Schaffner, S.: Women's fertility and employment decisions under two political systems: Comparing east and west Germany before reunification. Ruhr Economic Papers, vol. 149. (2009)

Büchel, F., Spieß, K.: Kindertageseinrichtungen und Müttererwerbstätigkeit. Vierteljahreshefte Wirtschaftsforsch **71**(1), 95–113 (2002)

Budig, M.J., England, P.: The wage penalty for motherhood. Am Sociol Rev **66**, 204–225 (2001)

Bühlmann, F., Elcheroth, G., Tettamanti, M.: The divison of labour among European couples: The effects of life course and welfare policy on value-practice configurations. Eur Sociol Rev **26**, 49–66 (2010)

Busch, A.: Die berufliche Geschlechtersegregation in Deutschland. Ursachen, Reproduktion, Folgen. Springer VS, Wiesbaden (2013)

Busch, A., Holst, E.: Berufswahl wichtig für Karrierechancen von Frauen und Männern. Wochenber DIW Berl **23**, 376–385 (2009)

Busch, A., Holst, E.: The gender pay gap in leadership and other white-collar positions in Germany: Putting the relevance of women's share in occupations into context. Z Soziol **42**(4), 315–336 (2013)

Cech, E.A., Blair-Loy, M.: Consequences of flexibility stigma among academic scientists and engineers (english). Work Occup **41**(1), 86–110 (2014)

Charles, M., Grusky, D.B.: Occupational ghettos. the worldwide segregation of women and men. Stanford University Press, Stanford (2004)

Crompton, R., Lyonette, C.: Women's career success and work–life adaptations in the accountancy and medical professions in Britain. Gend Work Organ **18**(2), 231–255 (2011)

Drasch, K.: Between familial imprinting and institutional regulation. IAB Discussion Paper, vol. 9. Institute for Employment Research, Nürnberg (2012)

Drasch, K.: Educational attainment and family-related employment interruptions in Germany: Do changing institutional settings matter? Eur Sociol Rev **29**(5), 981–995 (2013)

Dressel, C., Cornelißen, W., Wolf, K.: Vereinbarkeit von Familie und Beruf. In: Cornelißen, W. (ed.) 1. Datenreport zur Gleichstellung von Frauen und Männern in der Bundesrepublik Deutschland, pp. 278–356. Bundesminisiterium für Familie, Senioren, Frauen und Jugend, München (2005)

Drobnič, S., Blossfeld, H.-P., Rohwer, G.: Dynamics of women's employment patterns over the family life course: A comparison of the United States and Germany. J Marriage Fam **61**, 133–146 (1999)

Ejrnæs, M., Kunze, A.: Work and wage dynamics around childbirth. Scand J Econ **115**(3), 856–877 (2013)

Falk, S.: Geschlechtsspezifische Ungleichheit im Erwerbsverlauf. Analysen für den deutschen Arbeitsmarkt, 1st edn. VS Verlag für Sozialwissenschaften, Wiesbaden (2005)

Filer, R.K.: Male-female wage differences: The importance of compensating differentials. Ind Labor Relat Rev **38**, 426–437 (1985)

Franz, W.: Arbeitsmarktökonomik. Springer, Berlin Heidelberg (2003)

Frodermann, C., Müller, D., Abraham, M.: Determinanten des Wiedereinstiegs von Müttern in den Arbeitsmarkt in Vollzeit oder Teilzeit. Kolner Z Soz Sozpsychol **65**(4), 645–668 (2013)

Glauber, R.: Gender, occupational composition, and flexible work scheduling. Sociol Q **52**(3), 472–494 (2011)

Glauber, R.: Women's work and working conditions: Are mothers compensated for lost wages? Work Occup **39**(2), 115–138 (2012)

Gottschall, K., Bird, K.: Family leave policies and labor market segregation in Germany: Reinvention or reform of the male breadwinner model? Rev Policy Res **20**(1), 115 (2003)

Grunow, D., Aisenbrey, S., Evertsson, M.: Familienpolitik, Bildung und Berufskarrieren von Müttern in Deutschland, USA und Schweden. Kölner Z Soziol Sozialforsch **63**(3), 395–430 (2011)

Grunow, D., Müller, D.: Kulturelle und strukturelle Faktoren bei der Rückkehr in den Beruf. Ostdeutsche, westdeutsche und ost-west-mobile Mütter im Vergleich. IAB Discussion Pape, vol. 2. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (2012)

Gustafsson, S.S., Wetzels, C.M.M.P., Vlasblom, J.D., Dex, S.: Women's labor force transitions in connection with childbirth: A panel data comparison between Germany, Sweden and Great Britain. J Popul Econ **9**(3), 223–246 (1996)

Hacket, A.: Lohnt sich Mobilität? VS Verlag für Sozialwissenschaften, Wiesbaden (2009)

Hakim, C.: Lifestyle preferences as determinants of women's differentiated labor market careers. Work Occup **29**(4), 428–459 (2002)

Hausmann, A.-C., Kleinert, C.: Berufliche Segregation auf dem Arbeitsmarkt: Männer- und Frauendomänen kaum verändert. IAB Kurzbericht, vol. 9. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (2014)

Hausmann, A.-C., Zucco, A., Kleinert, C.: Berufspanel für Westdeutschland 1976–2010 (OccPan). Dokumentation zur Erstellung und Anonymisierung. FDZ-Methodenbericht, vol. 09. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (2015)

Helbig, M.: Die Umkehrung – Geschlechterungleichheiten beim Erwerb des Abiturs im Wandel. In: Becker, R., Solga, H. (eds.) Soziologische Bildungsforschung, vol. 52, pp. 374–392. Springer, Wiesbaden (2012). Kölner Zeitschrift für Soziologie und Sozialpsychologie Sonderhefte

Hinz, T., Gartner, H.: Geschlechtsspezifische Lohnunterschiede in Branchen, Berufen und Betrieben. Z Soziol **34**(1), 22–39 (2005)

Jacobs, J.A., Steinberg, R.J.: Compensating differentials and the male-female wage gap: Evidence from the New York State comparable worth study. Soc Forces **69**(2), 439–468 (1990)

John, B., Stutzer, E.: Erwerbsverhalten von Erziehungsurlauberinnen. Z Fam Forsch **14**(3), 215–233 (2002)

Killingsworth, M.R., Heckman, J.J.: Female labor supply: A survey. In: Ashenfelter, O., Layard, R. (eds.) Handbook of labor economincs, pp. 103–204. Elsevier, Amsterdam (1986)

Konietzka, D.: Die Verberuflichung von Marktchancen. Die Bedeutung des Ausbildungsberufs für die Plazierung im Arbeitsmarkt. Z Soziol **28**(5), 379–400 (1999)

Krüger, H., Born, C., Kelle, U.: Sequenzmuster in unterbrochenen Erwerbskarrieren von Frauen. In: Bremen, U. (ed.) Arbeitspapier, Sfb 186 Statuspassagen und Risikolagen im Lebensverlauf, 7 edn. Universität Bremen, Bremen (1989)

Leuze, K.: Smooth path or long and winding road? How institutions shape the transition from higher education to work. Fachportal Pädagogik. DIPF, Germany (2010)

Leuze, K., Strauß, S.: Why do occupations dominated by women pay less? How 'female-typical' work tasks and working-time arrangements affect the gender wage gap among higher education graduates. Work Employ Soc (2016). doi:10.1177/0950017015624402

Liebeskind, U.: Arbeitsmarktsegregation und Einkommen. Kolner Z Soz Sozpsychol **56**(4), 630–652 (2004)

Lois, D., Kopp, J.: Zeitdiskrete Ereignisdatenanalyse (2009). https://www.tu-chemnitz.de/hsw/soziologie/Professuren/Empirische_Sozialforschung/Lehre/statistikskripte.php, Accessed 1 June 2015

Lörz, M., Schindler, S.: Geschlechtsspezifische Unterschiede beim Übergang ins Studium. In: Hadjar, A. (ed.) Geschlechtsspezifische Bildungsungleichheiten, pp. 99–122. VS Verl. für Sozialwiss., Wiesbaden (2011)

Mertens, A.: Industrielle und berufliche Mobilität: Eine Untersuchung auf der Basis der IAB-Beschäftigtenstichprobe. Mitt Arbeitsmarkt Berufsforsch **30**(3), 663–670 (1997)

Mood, C.: Logistic regression: Why we cannot do what we think we can do, and what we can do about it. Eur Sociol Rev **26**(1), 67–82 (2010)

North, D.C.: Institutionen, institutioneller Wandel und Wirtschaftsleistung. Mohr, Tübingen (1998)

Ochsenfeld, F.: Preferences, constraints, and the process of sex segregation in college majors: A choice analysis. Soc Sci Res **56**, 117–132 (2016). doi:10.1016/j.ssresearch.2015.12.008

Ondrich, J., Spieß, C.K., Yang, Q.: Changes in women's wages after parental leave. Schmollers Jahrb **123**(1), 125–138 (2003)

Ondrich, J., Spieß, K.C., Yang, Q.: Barefoot and in a German kitchen: Federal parental leave and benefit policy and the return to work after childbirth in Germany. J Popul Econ **9**(3), 247–266 (1996)

Ondrich, J., Spieß, K.C., Yang, Q.: The effect of maternity leave on women's pay in Germany 1984–1994. Discussion Paper DIW Berlin, vol. 289. DIW Berlin, German Institute for Economic Research, Berlin (2002)

Pollmann-Schult, M., Wagner, M.: Vaterschaft im Kontext. Wie die Familiengründung die Erwerbstätigkeit von Männern beeinflusst. WZB Mitteilungen, vol. 143., pp 19–22 (2014)

Roos, P.A.: Gender and work: A comparative analysis of industrial societies. SUNY Press, New York (1985)

Ruhm, C.J.: The economic consequences of parental leave mandates: Lessons from Europe. Q J Econ **113**(1), 285–317 (1998)

Sackmann, R., Rasztar, M.: Das Konzept "Beruf" im lebenslaufsoziologischen Ansatz. In: Blaschke, D., Engelbrech, G., Heinz, W.R., Dressel, W. (eds.) Was prägt Berufsbiographien? Lebenslaufdynamik und Institutionenpolitik. Beiträge zur Arbeitsmarkt- und Berufsforschung, vol. 215, pp. 25–53. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (1998)

Schmelzer, P., Kurz, K., Schulze, K.: Einkommensnachteile von Müttern im Vergleich zu kinderlosen Frauen in Deutschland. Kolner Z Soz Sozpsychol **67**(4), 737–762 (2015)

Schönberg, U., Ludsteck, J.: Maternity leave legislation, female labor supply, and the family wage gap. IZA Discussion Paper, vol. 2699. Forschungsinstitut zur Zukunft der Arbeit, Bonn (2007)

Schulz, F., Blossfeld, H.-P.: Wie verändert sich die häusliche Arbeitsteilung im Eheverlauf? Kölner Z Soziol Sozialforsch **58**(1), 23–49 (2006)

Singer, J.D., Willett, J.B.: Applied longitudinal data analysis. Oxford University Press, New York (2003)

Solga, H., Konietzka, D.: Occupational matching and social stratification – theoretical insights and empirical observations taken from a German-German comparison. Eur Sociol Rev **15**(1), 25–47 (1999)

Statistisches Bundesamt: Öffentliche Sozialleistungen. Statistik zum Elterngeld. Beendete Leistungsbezüge für im Jahr 2013 geborene Kinder. Statistisches Bundesamt, Wiesbaden (2015)

Stuth, S., Hennig, M.: Ist der Beruf entscheidend? Zum Einfluss beruflicher Eigenschaften auf die Dauer familienbedingter Nichterwerbsphasen von Frauen. WZB Discussion Paper, vol. P 2014–006. Wissenschaftszentrum Berlin für Sozialforschung, Berlin (2014)

Stuth, S., Hennig, M., Allmendinger, J.: Die Bedeutung des Berufs für die Dauer von Erwerbsunterbrechungen. WZB Discussion Paper, vol. P 2009–001. Wissenschaftszentrum Berlin für Sozialforschung, Berlin (2009)

Trappe, H.: Berufliche Segregation im Kontext: Über einige Folgen geschlechtstypischer Berufsentscheidungen in Ost- und Westdeutschland. Kolner Z Soz Sozpsychol **58**(1), 50–78 (2006)

Trappe, H.: Väterzeit – das Elterngeld als Beschleuniger von Gleichstellung? Z Fam Forsch **25**(2), 238–264 (2013)

Trappe, H., Rosenfeld, R.A.: Occupational sex segregation and family formation in the former East and West Germany. Work Occup **31**(2), 155–192 (2004)

vom Berge, P., König, M., Seth, S.: Sample of Integrated Labour Market Biographies (SIAB) 1975–2010. FDZ Datenreport, vol. 01. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (2013)

Waldfogel, J.: Understanding the "family gap" in pay for women with children. J Econ Perspect **12**(1), 137–156 (1998)

Wanger, S.: Ungenutzte Potenziale in der Teilzeit. Viele Frauen würden gerne länger arbeiten. IAB Kurzbericht, vol. 9. Institut für Arbeitsmarkt- und Berufsforschung, Nürnberg (2011)

Weber, A.M.: Wann kehren junge Mütter auf den Arbeitsmarkt zurück? ZEW Discussion Paper, vol. 08. Zentrum für Europäische Wirtschaftsforschung, Mannheim (2004)

Weber, M.: Wirtschaft und Gesellschaft: Grundriss der verstehenden Soziologie. Mohr, Tübingen (1972)

Williams, J.: Unbending gender. Why family and work conflict and what to do about it. Oxford University Press, Oxford (2000)

Wolf, C., Best, H.: Handbuch der sozialwissenschaftlichen Datenanalyse. VS Verlag für Sozialwissenschaften, Wiesbaden (2010)

Ziefle, A.: Die individuellen Kosten des Erziehungsurlaubs. Kölner Z Soziol Sozialforsch **56**(2), 213–231 (2004)

Ziefle, A.: Familienpolitik als Determinante weiblicher Lebensverläufe? VS Verlag für Sozialwissenschaften, Wiesbaden (2009)

Ziefle, A., Gangl, M.: Do women respond to changes in family policy? A quasi-experimental study of the duration of mothers' employment interruptions in Germany. Eur Sociol Rev **30**(5), 562–581 (2014)

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