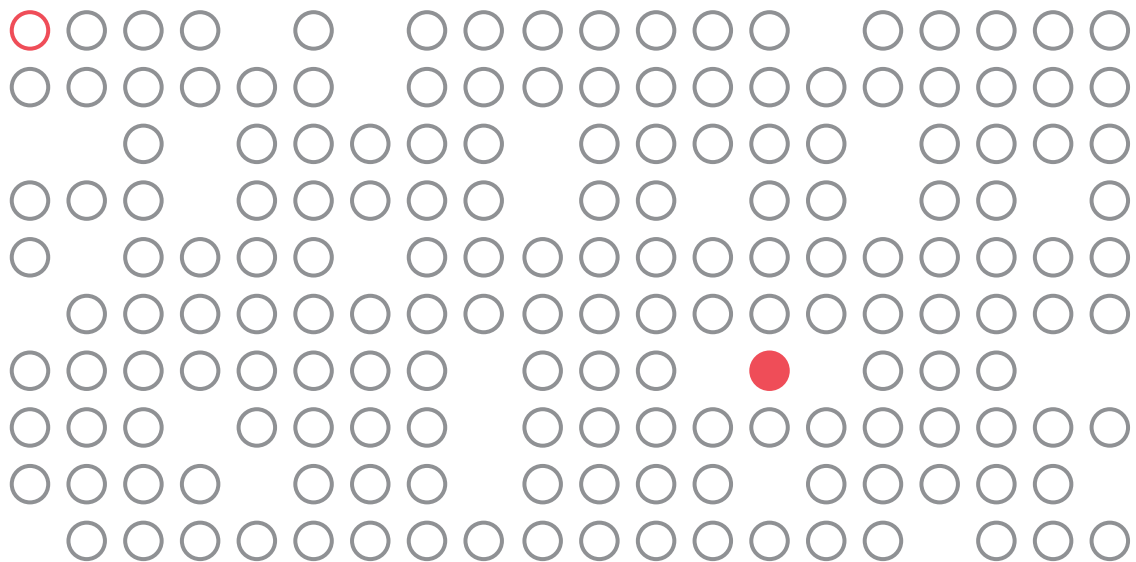

INAUGURAL DISSERTATION 2018

Expanding Public Childcare Services for Under-threes

AN EMPIRICAL INVESTIGATION OF MATERNAL
EMPLOYMENT AND GENDER IDEOLOGIES IN EAST AND
WEST GERMANY

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BAMBERG
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Expanding Public Childcare Services for Under-threes

**An Empirical Investigation of Maternal Employment and
Gender Ideologies in East and West Germany**

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Chapter 1 Public Childcare Provision, Gender Ideologies and Maternal Labour Market Participation – An Introduction and Overview

1 Introduction

Although in most industrialised countries, women's labour force participation has increased tremendously over the last few decades, gender inequalities in paid and domestic work have remained persistent. To date, most women continue to leave work or at least significantly reduce their working time after the birth of a child. Hence, mothers experience much more disruption in their employment life course trajectories compared to men or childless women (e.g., Aisenbrey, Evertsson and Grunow, 2009; Hook and Pettit, 2016; Simonson, Gordo and Titova, 2011; Struffolino, Studer and Fasang, 2016; Uunk, Kalmijn and Muffels, 2005).

Most western countries have therefore implemented policies that foster the reconciliation of paid employment and family work and, thus, aim at shortening family related employment interruptions and increasing maternal labour force participation. These work-family policies include leave policies for mothers and fathers, institutionalised childcare and policies regulating flexible work arrangements (see Hegewisch and Gornick, 2011 for an overview).¹ In the case of Europe, the European council has set precise coverage target rates for the national provision of childcare in all member states to further increase the female labour market participation rate up to 60 per cent, and thus, to reduce persistent gender inequalities over the life course across the EU. By 2010, access to childcare facilities were expected to be provided for at least 33 per cent of under-threes, and about 90 per cent for children between three and the mandatory school age in all member states (European Commission, 2008).

In line with EU policy-making, Germany has implemented a major childcare expansion to increase employment among mothers with under-threes. Germany has long been known for its considerably low maternal labour force participation rate (e.g., Böckmann, Misra and Budig, 2015; Fitzenberger, Sommerfeld and Steffes, 2013; Halldén, Levanon and Kricheli-Katz, 2016; Landivar, 2015; Ziefle, 2009), long employment interruptions after childbirth (e.g., Fitzenberger, Sommerfeld and Steffes, 2013; Schönberg and Ludsteck, 2014; Ziefle and Gangl, 2014), high part-

¹ For the purposes of this thesis, the term childcare is used to address public or publicly subsidised childcare service centres, in German known as *Kinderkrippe*, *Kindergarten*, *Kindertageseinrichtung* or *Kindertagesstätte*. Family day-care refers to single licensed carers (*Kindertagespflege*) who care for a smaller number in third-party rooms or their own homes and who also became publicly funded with the childcare reform (Schober, 2014).

time rates (e.g., Frodermann, Müller and Abraham, 2013; Hook, 2015; Simonson, Gordo and Titova, 2011), and a substantial motherhood penalty (e.g., Adda, Dustmann and Stevens 2017; Aisenbrey, Evertsson and Grunow, 2009; Budig, Misra and Boeckmann, 2015; Gangl and Ziefle, 2009; Schmelzer, Kurz and Schulze, 2015). During the course of the childcare expansion, childcare attendance rates have increased considerably across Germany, albeit starting from low levels in West Germany (Strunz, 2015). Hence, given the tremendous public investments in childcare services, the question remains as to whether increased childcare provision for under-threes has successfully encouraged maternal employment in East and West Germany.

By focusing on a period of a major increase in childcare provision in Germany, this thesis aims at investigating whether higher levels of childcare provision for under-threes are positively associated with maternal employment and a change in individual gender ideology among parents with young children. To date, only a few studies have investigated the consequences of this tremendous increase in public childcare services, however these studies provide mixed evidence on the positive effect on maternal employment (e.g., Müller, Sengül and Wrohlich, 2015; Müller and Wrohlich, 2016). Additionally, no study has yet addressed the question of whether the childcare expansion is associated with short-term changes in gender ideologies. Hence, this thesis investigates, firstly, whether the increase in public childcare provision has facilitated short-term change in individual-level gender ideologies among parents with young children (Chapter 2). Secondly, it analyses whether higher levels of childcare provision were associated with shorter employment interruptions amongst mothers of under-threes (Chapter 3). Thirdly, the thesis investigates whether the association between childcare provision for under-threes and maternal employment has been more pronounced among certain subgroups of mothers, considering mothers' educational attainment, first and second births, maternal part- or full-time employment, and whether the relationship with maternal employment was stronger when full-time childcare is available, or provision that includes both full- and part-time places (Chapter 4). By investigating these questions separately for East and West Germany, the thesis examines the relationships in two contexts that differ remarkably in the acceptance and use of formal childcare and maternal employment prior to the start of the childcare expansion.

Focusing on the relationship between public childcare provision and gender ideologies, as well as maternal employment is relevant for various reasons. Given long lasting disadvantages for women of non-continuous and predominantly marginal or part-time employment and its negative implications for society as a whole, the importance of shortening maternal employment interruptions and supporting the full-time employment of mothers becomes apparent. Previous research on the reconciliation of work and family has confirmed that the availability of public

childcare services seems to be particularly relevant to enable mothers to return to employment faster and preferably to full-time positions after childbirth (see Morrissey, 2017 for an overview).

Among the disadvantages suffered at the individual-level, previous life course research has shown that not only do longer employment interruptions and the predominance of part time employment among mothers lead to a loss in mother's current income (e.g., Fitzenberger, Sommerfeld and Steffes, 2013; Halldén, Levanon and Kricheli-Katz, 2016), and a more traditional division of domestic work (e.g., Cooke, 2007; Fuwa and Cohen, 2007; Hook, 2010; Kühhirt, 2012; Schober and Zoch, 2015), they also tend to place women on permanently lower career and income trajectories compared to men and childless women (e.g., Adda, Dustmann and Stevens, 2017; Aisenbrey, Evertsson and Grunow, 2009; Beblo, Bender and Wolf, 2009; Ejrnaes and Kunze, 2013; Evertsson, Grunow and Aisenbrey, 2016; Schmelzer, Kurz and Schulze, 2015; Ziefle, 2004). In the long run, long family related employment interruptions and marginal and part-time employment reduce mothers' pension entitlements, thus, increasing the risk of old-age poverty, particularly for single mothers (e.g., Hinrichs, 2017; Madero-Cabib and Fasang, 2016). Hence, the gender inequalities in income and career trajectories are not only limited to working life, but translate into later economic difficulties during the female life course. Particularly in Germany, the employment system is one of the most important in terms of determining an individual's life course outcomes as it provides a major allocation function via the earning-related system of social security with respect to later life course transitions, such as into unemployment and retirement (Hinrichs, 2017). Hence, women, and especially mothers, are exposed to greater risks of lower income-trajectories over their life course (e.g., Adda, Dustmann and Stevens, 2017; Struffolino, Studer and Fasang, 2016). In sum, the long lasting consequences of disrupted employment trajectories for mothers stress the relevance of increasing maternal employment and shortening family related employment interruptions through supportive work family policies.

In addition to the negative implications of mothers' reduced labour market participation on the individual-level, there are also economic arguments that stress the benefits for society as a whole of the continuous labour market participation of mothers, and thus the provision of public childcare in order to facilitate the combination of work and family. In the light of particularly high and increasing pension and healthcare costs due to an older population (Ferragina and Seeleib-Kaiser, 2015; Hinrichs, 2017), it becomes particularly important to increase employment among the active population, which is subject to taxation and social insurance contributions and, at the same time, to reduce the share of marginally employed women with only low pension entitlements in the future. In addition, given the continuing demographic trends, there is great fear of a future skills shortage on the national and regional level (Fleckenstein and

Seeleib-Kaiser, 2011), something which increased maternal employment participation could help to counter.

In sum, all of these factors show that increasing the employment participation of mothers is essential to both the well-being of individuals and of society as a whole. While previous research has shown that public childcare impacts positively on maternal labour supply, a few studies that have focused on the recent increase in public childcare in Germany prove mixed evidence on the positive effect on maternal employment (e.g., Geyer, Haan and Wrohlich, 2015; Müller, Sengül and Wrohlich 2015).

With respect to gender ideologies, previous research has shown that individual-level gender ideologies have been found to correlate with related behaviour, such as the gender division of paid and domestic labour, with less traditional gender ideologies being positively associated with maternal employment (e.g., Uunk, Kalmijn and Muffels, 2005; see Davis and Greenstein, 2009 and Steiber and Haas, 2012 for an overview). Earlier studies have predominantly evaluated how gender ideologies are formed during early socialisation and, hence, also vary with respect to the contextual factors present in different welfare regimes. Accordingly, welfare regimes that consist of more supportive family-work policies with respect to maternal employment correlate with less traditional gender ideologies on the individual-level (e.g., Böckmann, Misra and Budig, 2015; Grunow and Evertsson, 2016; Sjöberg, 2004). With longitudinal data becoming increasingly available, recent research has investigated intra-individual change in gender ideologies, providing positive evidence with respect to the impact of life course transitions (e.g., Baxter *et al.*, 2015; Brooks and Bolzendahl, 2004; Schober and Scott, 2012). However, to date only a few longitudinal studies have provided evidence on life course changes in gender ideologies in response to major changes in the institutional framework (Ellingsæter, Kitterød and Lyngstad, 2017; Gangl and Ziefle, 2015; Kotsadam and Finseraas, 2011; Unterhofer and Wrohlich, 2017). Considering the major shift in childcare policies in Germany, it comes somewhat as a surprise that none of the recent studies has investigated whether the tremendous expansion in childcare provision has facilitated individual change in gender ideologies.

Given the importance of maternal employment and its relationship with less traditional gender ideologies and public childcare provision, this thesis aims at contributing to the understanding of maternal employment and short-term changes in gender ideologies in the context of the recent expansion of childcare services. The remainder of the thesis is organised as follows: Chapter 1 provides an introduction to the institutional framework of maternal employment, particularly with respect to the recent increase in childcare provision across Germany. This is followed by a

presentation of relevant previous research on gender ideologies and maternal employment and their relationship with family policies, such as childcare services. After a brief overview of the major theoretical concepts that help to understand the influence of increased public childcare provision on short-term changes in gender ideologies, as well as on maternal labour market behaviour, the three major research themes are briefly summarised and their overall results presented. The empirical chapters 2 to 4, which constitute the cumulative dissertation, then present the theoretical considerations, the methodological framework and the empirical results, as well as their discussion for each of the three research questions in greater detail. Finally, chapter 5 summarises and critically discusses the major empirical findings concerning the relationship of increased public childcare expansion and changes in gender ideologies, as well as maternal employment in East and West Germany. The thesis closes with an outlook on promising future research.

2 Background: The Institutional Framework in Germany

Previous life course research on family formation and the gender division of paid and domestic work has emphasised the importance of the institutional context for explaining differences in work-care arrangements and, hence, gender disparities in overall life course trajectories (e.g., Cooke and Baxter, 2010; Evertsson, Grunow and Aisenbrey, 2016; Grunow and Evertsson, 2016; Madero-Cabib and Fasang, 2016; Simonson, Gordo and Titova, 2011; Struffolino, Studer and Fasang, 2016). The institutional context comprises the welfare state that consists of a large variety of different work and care policies, the labour market context, and the societal level of gender culture (Grunow and Veltkamp, 2016). In sum, the institutional context, also referred to as the institutional framework, has been shown to be an important provider of opportunity structures (e.g., Kohli, 2007; Mayer, 2009) as well as an important point of reference for work-care decisions and, hence, maternal employment (e.g., Grunow and Evertsson, 2016).

Given the importance of the institutional context for maternal employment, this section presents the institutional background in Germany. The first subsection characterises the German welfare state with respect to different regime typologies, and briefly summarises the developments of family policies and maternal employment in East and West Germany up until the millennium. The second subsection highlights more recent changes in family policies, and focuses particularly on the public childcare expansion for under-threes that started in 2005. The section concludes with a short summary and questions that arise from the recent changes in the German family policy model.

2.1 Reconciliation of Work and Family before the Turn of the Millennium - between the Ideal of a Conservative Welfare Regime and Supported Familialism

Based on the perhaps most prominent welfare regime typology by Esping-Andersen (1998), Germany and its institutional framework has been described as the *conservative welfare regime* par excellence.² Since the late 19th century, status-based welfare provision through the system of social insurances (Hinrichs, 2017) has been the dominant paradigm of the German social security system.³ Based on earnings related contributions from standard employment, these insurances provide wage replacement benefits for temporarily unemployed or retired workers and their families. As both access to and the value of the benefits paid, particularly in the case of retirement and unemployment, depend on prior proportional earnings-related contributions and, thus, indirectly on individual life-time earnings, the German welfare state centres particularly on wage labour (id.).

However, when it comes to the employment trajectories of women in general, and mothers in particular, in Germany, the dominance of status-based welfare provision through the system of social insurances results in several specificities for analysing the impact of the welfare regime on inequalities. The system of earnings-related contributions was designed based on the standard employment relationship (*Normalarbeitsverhältnis*) (Hinrichs, 2017). This concept relies on the assumption of a continuous and stable, dependent employment with one single employer, an employment relationship that prevailed when the social insurance system was designed and established. Employment was assumed to be full-time, with an unlimited contract and a salary that is enough to provide for a family's up-keep with a working man and a female homemaker. Hence, employment interruptions were considered to be rare and comparatively short (id.). However, although maternal employment participation rates have increased significantly, women leave work or at least significantly reduce their working time after the birth of their first child (e.g., Lewis, 2010; Struffolino, Studer and Fasang, 2016; Simonson, Gordo and Titova, 2011). This disrupted employment history not only leads to a loss in current income and permanently lower career and income trajectories, but translates into lower unemployment benefits and pension entitlements compared to men or childless women (e.g., Madero-Cabib and Fasang, 2016), thus, increasing the risk of poverty during times of unemployment and retirement particularly for mothers.

² Esping-Andersen's (1998) state-market focused typology of three ideal-types of welfare provision is based on the provided level of *decommodification*, that is "the degree to which individuals or families can uphold a socially acceptable standard of living independently of market participation" (Esping-Andersen, 1998: 37), and how this level of provision is delivered and distributed among the population and, thus, associated with social stratification.

³ To date, the insurance system remains very important as in 2016, social insurance expenditures amounted to 61.2 per cent of all total social expenditures, which is about 17.7 per cent of GDP (BMAS, 2017).

To account for the more disrupted employment trajectories for mothers and the persistent gender differences in paid and domestic work, not only in Germany, but also in most other European welfare states (Kohli, 2007; Lewis, 2010), additional welfare regime typologies have emerged that either extend Esping-Andersen's state-market relationship to a state-market-family perspective (Bonoli, 1997; Esping-Andersen, 1999; Orloff, 1993) or establish a central focus on gender and family (Crompton, 1999; Lewis, 1992; Pfau-Effinger, 1998). While Esping-Andersen's state-market based regime-typology had come under increasing criticism for not sufficiently accounting for the role of family and gender in welfare provision (e.g., Bonoli, 1997; Hook, 2015; Lewis, 1992; Lewis, 2010; Orloff, 1993; Saraceno and Keck, 2010), these new typologies aimed at shifting the perspective on women's labour market participation.⁴ Since, the alternative gender-focused *male breadwinner typology* has been frequently applied to analyse the impact of welfare regimes on the division of work and care among couples with young children (Crompton, 1999; Lewis, 2010; Lewis, Campbell and Huerta, 2008).⁵

Given the strongly gendered division of paid and domestic work, and, in line with most conservative welfare regimes, with the dominant model of a full-time working man and a woman focusing exclusively on household work during the 1950s post-war period, Germany had long been classified as a *male-breadwinner regime* (Lewis, 2003).⁶ However, in line with most western states, during the 1960s and 1970s maternal employment rates increased considerably in Germany, hence establishing the *dual-earner family* (Pfau-Effinger, 1998), or, the so-called *modernised male breadwinner model*, with a full-time working man and part-time working wife, as the most common arrangement across Europe (Lewis, 2010; Sigle-Rushton and Kenney, 2004). Although a number of explanations for the rise of female employment can be found, the most important driving forces include educational expansion (Coltrane, 1998), birth control, and thus changes in family structure with an increase in age at marriage and first birth as well as declining fertility rates, and increasing employment opportunities for women on the demand side (Lewis, 2010). In line with other European welfare states, the German government started to increasingly support maternal employment to further increase overall labour market participation rates (Sigle-Rushton and Kenney, 2004). Thus, during the late 1970s and mid-1980s, several reforms,

⁴ By focusing exclusively on (male) employment, Esping-Andersen's typology concentrated on the state-market relation of welfare provision but disregarded the disadvantageous access conditions to employment for mothers with young children and, thus, the gender inequalities in paid and unpaid work (e.g., Lewis, 1992; Lewis, 2010; Orloff, 1993). As the family's contribution to welfare provision was completely neglected (e.g., Bonoli, 1997; Orloff, 1993), this also resulted in the non-integration of Southern European welfare states into the typology (Bonoli, 1997). In addition, the concept of decommodification did not include the provision of social welfare such as services for institutional child-care or tax reductions for particular groups of citizens.

⁵ It classifies regimes according to their level of support for the male breadwinner model that describes the gendered division of paid and domestic work with a full-time working man and a women focusing exclusively on household work (Lewis, 2010).

⁶ At this time, only social democratic regimes seemed to already successfully support the dual full-time model with both partners working full-time (Lewis, 2010; Sigle-Rushton and Kenney, 2004).

such as changes in marriage and family law, the introduction of paid maternity leave, and the establishment of equal rights in the work place for men and women, as well as for part-time and full-time workers, aimed at aiding the reconciliation of childcare and maternal employment, and thus increasing maternal employment participation (Bredtmann, Kluge and Schaffner, 2013; Drasch, 2012; Schober, 2014).

Although maternal employment had increased considerably, women continued to work predominantly part-time, and were still expected to be the main carer. Hence, the majority interrupted their employment for several years after childbirth, and often returned to the labour market as only part-time workers when children grew older (Bredtmann, Kluge and Schaffner, 2013; Frodermann, Müller and Abraham, 2013; Grunow, Aisenbrey and Evertsson, 2011; Lewis, 2010; Rosenfeld, Trappe and Gornick, 2004). Consequently, the institutional setting was characterised by long but low-paid parental leave entitlements, a lack of public childcare services, child and housing allowances, a tax advantage due to joint taxation for married couples, and a social security system that enabled access to health care also for (female) partners in atypical or marginal employment or unemployment (Hinrichs, 2017; Rosenfeld, Trappe and Gornick, 2004). With public childcare places few and far between in West German and very little use of informal paid carers, such as nannies or au pairs, about one third of families relied on informal care alternatives provided by relatives, friends or neighbours (Schober, 2014).

Given the institutional support for family related employment interruptions and part-time employment among mothers, Germany has not only been classified as a *conservative welfare regime* (Esping-Andersen, 1998) or a regime that supports the *dual-earner model* (Lewis, 2010) or (*modernised*) *male breadwinner*, but also as a regime of (*supported*) *familialism* (Esping-Andersen, 1999; Leitner, 2003). Related to mixed empirical evidence with respect to Esping-Andersen's modified regime typology, scholars have argued for the differentiation of family spending with regard to their support of maternal employment in regime typologies (Hook, 2015; Leitner, 2003; Saraceno and Keck, 2010).⁷ By focusing on the relationship between familialising and de-familialising policies such as childcare or parental leave legislation, three different patterns can be identified: (1) *Supported familialism* that corresponds to Esping-Andersen's familialistic (or conservative) regimes, (2) *Familialism by default* (Esping-Andersen's former non-familialistic or liberal regimes) with neither state-provided incentives nor alternatives to family care and (3) *De-*

⁷ Esping-Andersen (1999) has integrated the level at which families are expected to absorb social risks as opposed to the state or market, i.e. *familialism*, into his state-market focused typology. Consequently, *de-familialising* welfare regimes provide either market driven or public social services as an alternative to family provided welfare. Different types of social spending, i.e. on childcare, parental leave benefits or family allowances, are also considered to be de-familialisation measures. According to Esping-Andersen, his original regime typology seems robust to the integration of family as a third welfare provider, with *familialistic regimes* corresponding to the *conservative regimes*, while *non-familialising* and *de-familialising regimes* closely match *liberal* and *social democratic welfare states*.

familialism which corresponds to social-democratic regimes. An institutional framework like in Germany, where policies support care responsibilities, particularly of mothers, through transfers or taxation, is also considered to suppress employment of second earners (Leitner, 2003).

However, although the employment centred regime typologies have classified Germany as a male-breadwinner-regime or (supported) familialism, with East German mothers always having returned to work faster and more often to full-time positions after the birth of their child (Rosenfeld, Trappe and Gornick, 2004), within-country variation in maternal employment in Germany must be acknowledged. In the German Democratic Republic (GDR), the dual-earner model was a matter of course due to the strong economic necessity of integrating women into the production process, and to addressing decreasing fertility rates in the 1970s (Rosenfeld, Trappe and Gornick, 2004).⁸ Hence, the institutional framework aimed at encouraging women's labour supply in order to increase productivity by providing extensive levels of formal childcare starting at very young age, after-school-care, and comparatively short parental leave entitlements, as well as equal training and education opportunities for women (Drasch, 2012; Rosenfeld, Trappe and Gornick, 2004). Paid parental leave of one year was initially introduced only for second and third births in 1976 and extended to first births only in 1986 (Bredtmann, Kluge and Schaffner, 2013). Additionally, by the end of the 1980s, the GDR provided childcare to more than 80 per cent of all under-threes (id.). As a result, equal labour market participation of women was the norm, and thus became a central element of women's identity while, at the same time, the traditional role of women remained stable in private life (Cooke, 2007; Hook, 2006; Rosenfeld, Trappe and Gornick, 2004). Consequently, East Germany has to be classified as a regime that supported the *dual-earner model* (Lewis, 2010) with *de-familialising policies* (Leitner, 2003; Saraceno and Keck, 2010).

Following the reunification of Germany in 1990, several changes were applied to the system of parental leave legislation and the provision of childcare that increased mothers' employment interruptions after childbirth, particularly in East Germany. The employment-protected parental leave was extended to 18 months in 1990 and to a maximum of three years in 1992, including a parental allowance which was related to household income and paid up to 24 months (Drasch, 2012). Since 1996, each child up to the age of three was entitled to a slot in childcare for at least four hours a day (Bauernschuster and Schlotter, 2015). At the same time, especially childcare capacities for under-threes were drastically reduced in East Germany, as family formation

⁸ Full integration of both partners into the labour market with dual full-time employment as well as sometimes unpaid overtime was not only linked to higher income but tremendous individual advantages, such as the entitlement to a flat. In addition, the so called 'right to gainful employment', implying an actual compulsion to work, had been part of the GDR constitution (article 24, "Das Recht auf Arbeit und die Pflicht zur Arbeit bilden eine Einheit").

was increasingly postponed, and thus birth rates had considerably declined after reunification (Gebel and Giesecke, 2009; Goldstein and Kreyenfeld, 2011). Overall, the transformation process has resulted in long-lasting consequences for the East German labour market and economy, with persistently lower wages, higher unemployment and only few management positions until today (e.g., Blien *et al.*, 2016).

Since the reunification in 1990, employment trends among mothers with young children in East and West Germany converged somewhat, and part-time employment has become the most prevalent arrangement for combining employment and family care in both regions (Frodermann, Müller and Abraham, 2013; Hanel and Riphahn, 2012; Konietzka and Kreyenfeld, 2010; Simonson, Gordo and Titova, 2011; Trappe, Pollmann-Schult and Schmitt, 2015). This aligns with the majority of western countries, where the *modernised male breadwinner*, or the *one-and-a-half earner model* with a full-time working father and part-time employed mother, has replaced the male breadwinner model (Lewis, 2010; Lewis, Campbell and Huerta, 2008). In Germany, fewer weekly working hours of mothers were supported by the right to request a reduction of working hours in 2001 (Schober, 2014). Additionally, East-West differences were still reflected in longer employment interruption durations, lower maternal employment participation (Hanel and Riphahn, 2012; Schmelzer, Kurz and Schulze, 2015; Schober, 2013; Simonson, Gordo and Titova, 2011; Vogel, 2009), and more conservative attitudes of parents towards maternal employment and using formal childcare for young children in West Germany compared to East Germany (Adler and Brayfield, 1997; Banaszak, 2006; Bauernschuster and Rainer, 2012; Goerres and Tepe, 2012; Ziefle and Gangl, 2014). Moreover, long parental leave entitlements and worsening labour market opportunities for mothers with lower education levels seemed to increase educational disparities in maternal employment up to the mid-2000s (Drasch, 2013), with full-time employment only being more widespread among mothers with higher education levels (e.g., Konietzka and Kreyenfeld, 2010; Struffolino, Studer and Fasang, 2016).

2.2 The Paradigm Shift in German Family Policy – Towards the Model of Optional

Familialism

As in most European member states, including Germany, women continue to leave employment or at least significantly reduce their working hours after the birth of a child (Lewis, 2010; Sigler-Rushton and Kenney, 2004), the role of employment-led policies have gained importance on the EU level and at the national level of most member states (Lewis *et al.*, 2008; Lewis, 2006). There are several reasons for the increased importance raising the labour market participation rates of mothers (Lewis *et al.*, 2008), including rising unemployment, falling fertility rates, changes in

family and household formation, and an aging population that has increased welfare state expenditures. At the same time in most European states the financing of the welfare state has become more challenging. Thus, on the EU level, perspectives have shifted from broader work-family reconciliation policies, which were based on the assumption of a male breadwinner and a female carer, towards employment-led policies explicitly targeting maternal employment participation rates (Fleckenstein and Seeleib-Kaiser, 2011; Lewis *et al.*, 2008).⁹ In 2000, the Lisbon Strategy set a goal of about 60 per cent female labour market participation for all EU member states by 2010. In order to achieve this target, in 2002, the European Council set precise targets to increase female and maternal labour force participation, and to tackle gender-specific disadvantages by providing childcare services in all member states. By 2010, access to childcare facilities were expected to be provided for at least 33 per cent of under-threes, and about 90 per cent for children between three and the mandatory school age in all EU states (Lewis 2008).

In line with EU policy-making, German family policy reforms have undergone a paradigm shift since the mid-2000s to increase maternal labour market participation (Fleckenstein, 2011). This has involved a parental leave reform in 2007 (Deutscher Bundestag, 2008a), and the increase in childcare services for under-threes that started with two sets of legislation in 2005 and 2008 (Deutscher Bundestag, 2004; Deutscher Bundestag, 2008b). Although both parents had been given the opportunity to take parental leave at the same time or split the period of leave, to choose a higher flat-rate benefit for shorter leave period, or even to work long part time up to 30 hours a week since 2001 (Schober, 2014), maternal employment rates remained low, particularly among women with children under three, and among mothers in West Germany (e.g., Böckmann, Misra and Budig, 2015; Lewis, 2010; Ziefle and Gangl, 2014). Similarly, the share of men taking up parental leave remained about 5 per cent (Drasch, 2012). Hence, the two major reforms aimed at further improving the compatibility of employment and family care, thus speeding up maternal labour market return, and increasing paternal childcare involvement.

In addition, political science research has shown how, on the national level, changes in voter groups, and intraparty political conflicts, as well as the competition between the Christian Democrats (CDU) and the Social Democrats (SPD) played key roles in influencing the major recent work-family policy reforms in Germany (Fleckenstein, 2011; Blome, 2016). Generally, religious citizens had been more likely to vote for the CDU, while the SPD had predominantly attracted voters with lower levels of educational attainment. However, these more traditional

⁹ By the early 2000s, several recommendations had been issued to the member states, such as the 1992 Council recommendation on childcare, or the 1996 directive on parental leave, in order to increase work-family reconciliation, and to thereby promote gender equality in all member states (Lewis, 2006). However, these recommendations remained broad and targeted a wider range of family policies such as childcare services, parental leave or working time policies.

voter groups have diminished in size since the early 2000s (Blome, 2016; Fleckenstein, 2011). Consequently, both major parties tried to attract new voter groups, particularly younger and female voters, with more progressive views about mothers' employment, and thus started to increasingly advocate for more employment centred family policies.¹⁰ With the coalition government of both parties in 2005, both the parental leave reform and the childcare expansion were written into the coalition treaty and adopted later during the legislative period (Blome, 2016).

The Parental Leave Reform in 2007

The new federal law on parental allowance and parental leave was introduced in 2007 (Deutscher Bundestag, 2008a) and aimed at reducing income loss after childbirth, particularly among middle and high income new parents, increasing parental leave up-take among fathers and speeding up maternal labour market return after the first year after childbirth (Schober, 2014). The now income-related reimbursement with a replacement rate about 65 to 67 per cent of prior net earnings (capped at 1800 Euros) was shortened to 12 months. However, due to an individual 'use-it-or-lose-it' entitlement of two months leave for each parent, the leave period can be extended to a maximum of 14 months. Hence, the new leave scheme has provided a clear incentive for mothers to return to employment within the second year after childbirth. Parents who were not employed prior to birth, receive a minimum payment of about 300 Euros, which is offset against basic social security benefits. As before, employed parents are still entitled to three-years of employment protected leave (see Reimer, Eler and Blum, 2017 for a detailed overview on leave and employment-related policies in Germany).

Overall, the parental leave reform has changed the division of paid and domestic work in couples with young children. In terms of the maternal labour supply, the more generous and income-related compensation provide incentives to significantly reduce employment during the 12 months after child birth (Geyer, Haan and Wrohlich, 2015; Kluge and Tamm, 2013). However, within the second and third year after the birth, both East and West German mothers return to employment faster (Geyer, Haan and Wrohlich, 2015; Kluge and Schmitz, 2014), though predominantly to part-time work. Thereby, mothers are increasingly returning to their pre-birth employer, and their likelihood of only having a temporary contract has decreased. Among West German mothers with higher educational levels, and thus higher career orientation, a faster la-

¹⁰ Bujard (2014) has highlighted the political justification of the new parental leave scheme with respect to the agenda-setting process in the preparation and planning of the reform. Accordingly, in the public debate, political actors used the arguments of worryingly low fertility rates, particularly among those mothers with higher educational levels, the overall importance of gender equality and family income after the birth of a child, and the right of families to have a real choice in their work-care arrangements (Lewis *et al.*, 2008), rather than stressing the individual and overall societal economic reasons for increasing maternal employment.

bour market return to full-time employment is observed. In contrast, East German mothers increasingly return to part-time instead to full-time employment (Geyer, Haan and Wrohlich, 2015; Kluge and Schmitz, 2014). Additionally, the share of fathers taking up parental leave increased considerably from 3.5 per cent in 2006 to almost 36 per cent in 2015 (BMFSFJ, 2017a). However, in 2015 only 20 per cent of fathers took more than the two take-it-or-leave-it months, while among those, only 14 per cent of fathers took about 3 to 9 months, and only 7 per cent took parental leave for 7 to 12 months. In sum, there seems to be a negative trend in the duration of paternal leave take-up, as between 2008 and 2015 the average length has declined from 3.7 to 3.1 months (BMFSFJ, 2016). From a broader perspective, the parental leave reform represents a turning point towards greater policy support for maternal employment. However, in order to increase maternal employment, particularly within the second year after birth, when leave entitlements expire, the parental leave reform was closely linked to the massive expansion of childcare facilities for under-threes.

The Childcare Expansion

In addition to the parental leave reform in 2007, Germany has made notable public investments in institutionalised childcare to meet the European childcare policy targets, and thus, to increase maternal labour force participation. In 2005 and 2008, two federal laws were passed to increase the availability of childcare for under-threes to at least 35 per cent by 2013 (Deutscher Bundestag, 2004; Deutscher Bundestag, 2008b). The Day-care Expansion Act (*Tagesbetreuungsausbaugesetz*), implemented in 2005, provided extra funding and granted prioritised access for children with parents in employment or education. Additionally, the 2008 Child and Youth Welfare Act (*Kinderförderungsgesetz*) stipulated a legal right to formal care of about four to five hours a day in childcare centres, or family day care, for all children aged one year or older from August 2013 (Schober, 2014).¹¹ This was accompanied by the introduction of a small flat-rate care allowance (*Betreuungsgeld*) granted for those parents who favour exclusive parental care for their under-threes. However, in 2015, the German Constitutional Court declared the subsidy for stay-at-home parents to be incompatible with federal law.¹²

Although the childcare expansion has been financially supported by the federal government, it is planned and implemented by the German federal states and county-level (*Kreisebene*) authorities, so there is considerable variation in the degree to which childcare services have increased from year to year across Germany (see, for example, Figures A4.4 and A4.5 in Chapter

¹¹ Some federal states, such as Saxony, Thuringia and Rhineland-Palatine have introduced entitlements to childcare for some groups of younger children (Spieß, Berger and Groh-Samberg, 2008).

¹² In some federal states, including Bavaria and Saxony, cash-for-care allowances are still in place (Reimer, Erler and Blum, 2017).

4).¹³ Thus far, childcare attendance rates have increased tremendously, albeit starting from lower levels in West Germany. In 2006 almost all East German counties provided childcare to more than 30 per cent of all under-threes, whereas West German counties seldom achieved more than 20 per cent (Federal Statistical Office, 2007). Between 2006 and 2015, attendance rates, and therefore coverage rates, increased from 8 to 28 per cent in West Germany and from 40 to 52 per cent in East Germany (Federal Statistical Office, 2016).¹⁴ However, these averages mask great regional variation. For example in 2015, coverage levels ranged from 44 to 63 per cent in East Germany and from 13 to 47 per cent in West Germany (Federal Statistical Office, 2016). The regional variation in the expansion of childcare coverage over time is significantly related to counties' productivity and trends in maternal employment, the strength of their catholic history, and the political priorities of specific parties (Andronescu and Carnes, 2015).

Because the federal states' are responsible for implementing and financing childcare services, considerable differences exist across the 16 federal states, not only with respect to provision levels, but also regarding providers (see Spieß, Berger and Groh-Samberg, 2008 for a detailed overview). In sum, the majority of children attend childcare centres compared to a small share that is enrolled in family day care. The majority of childcare centres are run by non-profit providers, such as the German churches, Workers Welfare Organisation or the Paritätischer Wohlfahrtsverband (Spieß, Berger and Groh-Samberg, 2008), who are financially subsidised to different degrees according to the federal state or even county they are situated in. The second largest group are publicly provided childcare services, which are more important in East Germany. For-profit providers or employer provided childcare services continue to account for less than 3 per cent of all services.

As public subsidies and providers vary across federal states and counties, childcare services also differ with regard to hours of care provided, parental fees and quality standards of care across Germany, and between East and West (Spieß, Berger and Groh-Samberg, 2008). Particularly full-time coverage still varies tremendously. Thus in East Germany more than 40 per cent of all children aged under three attend childcare for more than 7 hours a day, compared to only 13 per cent in West Germany (Federal Statistical Office, 2016).¹⁵ Moreover, since counties and federal states cover the largest share of costs of childcare coverage (about 47 and 32 per cent

¹³ Between 2006 and 2015, federal expenditures on childcare provision have increased from 11 to about 24.6 billion (BMFSFJ, 2017a).

¹⁴ Despite the substantial increase in childcare provision, demand still exceeds supply in East and West Germany (BMFSFJ, 2015) As this is constantly monitored, the childcare attendance ratio is considered a measure of supply, i.e. coverage rates, rather than demand, which is in line with previous studies on Germany (for a detailed description, see for example Kreyenfeld and Hank, 2000; BMFSFJ, 2008).

¹⁵ Again, also averages in full-time childcare attendance ratios mask great variation across East German districts (51 to 97 per cent) and West German districts (3 to 94 per cent) (Strunz, 2015).

respectively), childcare fees (on average about 14 per cent of the costs) are often income dependent and well below the OECD average (Spieß, Berger and Groh-Samberg, 2008). Due to large subsidies, a considerable number of parents pays no fees at all, and in most states childcare fees vary according to the child's age and care intensity required (Spieß, Berger and Groh-Samberg, 2008). More recent research shows, however, that during the expansion period, parents' childcare expenditures have increased, particularly for households with higher incomes (Schmitz, Spieß and Stahl, 2017). Although the increase was not significant for low-income families or those at risk of poverty, these families face higher relative childcare costs compared to families with higher incomes (Schmitz, Spieß and Stahl, 2017). Furthermore, childcare provision varies in terms of quality standards, particular when it comes to the regulation of structural aspects such as minimum teacher-child ratios, group sizes, opening hours or supervision and training requirements for staff. In East Germany, child-teacher ratios and groups sizes are larger compared to West Germany, and sometimes larger than usually recommended for under-threes (see Schober, 2014 and Spieß, Berger and Groh-Samberg, 2008 for an overview).

Overall, childcare provision has increased tremendously in East and West Germany, however, in both regions the target rate of about 35 per cent of under-threes in public childcare by 2013 has proved to be a moving target, as parental demand has continuously increased since the start of the expansion. While in 2012 supply-demand discrepancies in childcare for under-threes amounted to 13 percentage points in West Germany and to 6.4 percentage points in East Germany, by 2016 these gaps had increased to 14.8 and 7.3 percentage points (BMFSFJ, 2015; 2017a).¹⁶ Although in East Germany the supply-demand discrepancies are smaller, and levels of childcare provision are generally higher, there remain considerable disparities between parental demand and existing provision in both parts of Germany. Parental demand also varies considerably across the federal states, with higher demand particularly in urban areas, as well as for children aged two to three. In addition, the majority of East German mothers favour extended care hours, whereas about 50 per cent of West German mothers are content with current hours (BMFSFJ, 2017b). In sum, despite their tremendous expansion, in many places childcare services still do not yet match parental demands with respect to available slots and available hours of care.

¹⁶ For West Germany, research showed that between 2012 and 2016 parental demand for a childcare place increased by 7.6 percentage points to 32.9 per cent for parents with under-threes, while at the same time childcare coverage rates only increased by 5.8 percentage points to 28.1 per cent (BMFSFJ, 2017b; BMFSFJ, 2015).

2.3 Summary

In Germany, the introduction of the parental leave scheme in 2007, and the tremendous increase in childcare provision for under-threes have caused a paradigm change in German family policies. The German welfare state had long been characterised as a *conservative welfare regime*, which was strongly associated with the (*modernised*) *male breadwinner model*. However, with the parental leave and childcare policy reforms of the mid 2000s, the policy framework has adopted the Nordic model of the *dual-earner, dual-carer* in order to increase maternal employment. Thereby, the childcare reform is in line with changes in other EU member states, which as a result of the Lisbon Strategy that aimed at increasing maternal employment rates across EU states, have agreed to the Barcelona targets of increased childcare provision. Hence, in most European countries, including Germany, social policies and family policies have become more employment oriented.

Nevertheless, despite the paradigm shift, at the same time the German family policy framework still contains elements of the male breadwinner model, thus, the mix of different family- and work policies is also classified as *optional familialism* (Leitner, 2003). This mix of different family- and work policies is found in between *supported familialism* and *de-familiarisations*. The individualised rights of partners to take parental leave, the flexibility to combine leave with part-time work of up to 30 hours per week, as well as the massive expansion in childcare provision and the childcare entitlement for children aged two or older, all point to the German family policy framework clearly adopting a more employment oriented approach and aimed explicitly at fostering maternal employment. However, simultaneously the flat-rate parental leave benefits for mothers not-employed prior to birth, or older familialising policies such as the comparatively long job-protected, but unpaid parental leave period of three years, and the joint taxation and family health insurance have continued to suppress the employment of second earners, particularly women. In addition, childcare provision for under-threes remains noticeably rationed in some regions in Germany. Hence, the current policy framework includes both elements of supported familialism which are considered to suppress maternal employment, but also elements of de-familialism that explicitly encourage the employment participation of mothers with young children (Leitner, 2003; Schober, 2014; Steiber, Berghammer and Haas, 2016). While, Saraceno and Keck (2010: 677) have stated that it “is a rare case” where policies coexist that push in both familialising and de-familialising directions, the German family policy model represents just such a situation of optional familialism.

As the paradigm change in family policies has not only been encouraged by a change in EU policy, but also by a shift in national policy-making, this might have additionally fostered

the ambiguity of the current institutional framework. On the national level this change was particularly enabled by a modernisation of the major parties, particularly the CDU, which formerly advocated the male breadwinner model but needed to increasingly appeal to potential female voters by providing more employment centred family policies. Because this change in family policies appears instrumentalist rather than driven by a general interest in supporting the dual-earner, dual-carer model (Fleckenstein, 2011), the current ambiguity of German family policy does not come as a surprise.

In sum, given the importance of the institutional context for gender inequalities in paid and unpaid work and care, the tremendous changes in German family policies might be associated with changes in maternal labour market behaviour and gender culture. However, to date, previous research has focused particularly on the consequences of the introduction of the parental leave reform in 2007. Hence, the question remains of whether the recent expansion of childcare facilities for under-threes is also associated with a change in maternal employment. Additionally, the increase in childcare services might be linked to a change in gender ideologies, and thus, to a change in gender culture. Some authors have argued that the paradigm shift in German family policy may challenge long established work-care ideals (Schober, 2014). Particularly in West Germany, where the ideal of maternal care for young children has remained comparatively strong and childcare provision has been severely rationed, the recent expansion in childcare facilities may have altered work-care norms, fostered maternal employment, and thus perhaps has narrowed the persistent East-West differences in maternal employment and work-care norms. Hence, this thesis aims at investigating whether higher levels of childcare provision for under-threes are positively associated with maternal employment and a change in individual gender ideology among parents with young children.

3 State of the Art

Previous research has shown that a considerable share of variation in maternal employment across and within different welfare states is explained by individual- and household-level factors, as well as the contextual framework of the respective welfare state. With respect to **individual- and household-level factors**, the transition to marriage, the presence and number of children, women's educational levels, (and thus labour market experience and individual earnings), and individual gender ideologies, as well as partner characteristics have been shown to be important determinants of maternal employment (see van der Lippe and van Dijk, 2002 for a detailed overview). Maternal employment is negatively associated with marriage, higher household income and childbirth, but increases along with the age of the youngest child (e.g., Drobnic, Blossfeld

and Rohwer, 1999; Geyer, Haan and Wrohlich, 2015; Hoherz, 2014; Kluge and Schmitz, 2014; Vogel, 2009; Triebe, 2013). Particularly for Germany, mothers with higher educational levels usually exhibit higher employment rates, shorter interruption durations and higher numbers of working hours compared to women with lower education levels (e.g., Fitzenberger, Sommerfeld and Steffes, 2013; Grunow, Aisenbrey and Evertsson, 2011; Hook, 2015; Keck and Saraceno, 2013; Kluge and Schmitz, 2014; Kluge and Tamm, 2013; Konietzka and Kreyenfeld, 2010; Stahl and Schober, 2017; Steiber and Haas, 2012; Struffolino, Studer and Fasang, 2016). Similarly, less traditional gender ideologies have been found to be important predictors for the division in paid, but also domestic, work among couples (e.g., Uunk, Kalmijn and Muffels, 2005; Nitsche and Grunow, 2016; see Davis and Greenstein, 2009 for an overview). However, some studies have also shown weak association or even inconsistencies between gender ideologies and individual employment behaviour, which might point to insufficient institutional support which prevents women from aligning their employment behaviour with their individual gender ideologies, and thus, highlight the additional relevance of contextual factors (Lewis, 2010; Steiber and Haas, 2009).¹⁷ Besides the individual and household level factors, **contextual factors** such as (1) the policy context, (2) labour market regimes and (3) the gender culture have also been found to influence maternal employment (see van der Lippe and van Dijk, 2002 for a detailed overview). While policies include family policies such as parental leave and childcare policies, as well as policies on flexible working time or tax regulations, gender culture refers to gender ideologies regarding the ideal family form and the division of paid and unpaid work and care among couples on the societal level (Grunow and Veltkamp, 2016).

Previous research has aimed at investigating the relationship between maternal employment and individual- and household-level factors as well as contextual factors by either employing comparative approaches on the macro-level or by applying micro-level approaches in single-country studies or studies using a small number of countries (Mayer, 2009; van der Lippe and van Dijk, 2002 for an overview). Comparative macro-level studies have frequently applied welfare regime or family policy typologies (e.g., Esping-Andersen, 1998; Esping-Andersen, 1999; van der Lippe and van Dijk, 2002), and thus, have pointed to the importance of contextual factors more indirectly. However, these studies fail to account for individual-level self-selection factors affecting mothers' returns to employment and childcare take-up (Böckmann, Misra and Budig, 2015). To account for individual-level variation in determinants of maternal employment and

¹⁷ Consequently, this evidence contradicts the theoretical assumptions of some scholars who argued that in modern societies, women's labour force participation is entirely the result of their individual work-care decisions, which are in turn closely linked to their individual preferences (Hakim, 2000).

childcare take-up, previous studies have therefore investigated maternal employment and childcare take-up by analysing large-scale data-sets from single-countries or across a small number of countries with different contextual frameworks (Mayer, 2009; van der Lippe and van Dijk, 2002 for an overview). However, in line with macro-level approaches that apply regime typologies, these studies often, firstly, do not consider direct measures of policy and labour market contexts but instead apply family policy indices or often refer to welfare regime typologies (e.g., Drobnic, Blossfeld and Rohwer, 1999; Evertsson, Grunow and Aisenbrey, 2016; Grunow, Hofmeister and Buchholz, 2006; Hook and Pettit, 2016). Or, secondly, if only focusing on one country, these studies lack sufficient variation, for example in county-level characteristics (e.g., Kreyenfeld and Hank, 2000; Schmelzer, Kurz and Schulze, 2015; Triebe, 2013). Furthermore, studies that have begun to shed light on these issues have not specifically investigated whether some policies have a greater effect on maternal employment than others but rather focused on policy packages (e.g., Böckmann, Misra and Budig, 2015; van der Lippe and van Dijk, 2002 for an overview). Consequently, most previous micro-level studies have failed to disentangle the influence of individual- and macro-level indicators.

In sum, micro- and macro-approaches do not adequately account for the variation in individual characteristics and the (within-country) variation in contextual factors respectively and, hence, fail to include relevant explanatory factors in their analyses (van der Lippe and van Dijk, 2002). With respect to Germany, a surprisingly high number of comparative studies have not differentiated between East and West Germany (e.g., Andringa, Nieuwenhuis and van Gerven, 2015; Ciccia and Bleijenbergh, 2014; England, Gornick and Shafer, 2012; Hook, 2015; Kangas and Rostgaard, 2007; Pettit and Hook, 2005; Stier, Lewin-Epstein and Braun, 2001). Thus, these studies do not account for within-country variation in childcare provision, labour market opportunities, or gender culture. In sum, these gaps in research point to the importance of single policy analysis to more carefully investigate the social and national disparities in maternal employment.

In response to the limitations of micro- and macro-level approaches, more recent comparative and single-country studies have combined individual-level data with direct measures of the contextual framework, such as administrative data on childcare provision, parental leave arrangements, labour market indicators or occupational information (e.g., Bächmann and Gattermann, 2017; Evertsson, Grunow and Aisenbrey, 2016; Hondralis and Buchholz, 2017; Schober and Spieß, 2015; Sjöberg, 2004; van der Lippe and van Dijk, 2002; Ziefle and Gangl, 2014). By disentangling compositional differences at the individual-level and cultural or policy variations at the macro level, these studies, particularly those that apply panel data, aim at better explaining between and within country differences in women's employment participation than most

previous cross-sectional, comparative studies, and studies focusing exclusively on the individual-level (van der Lippe and van Dijk, 2002). In sum, micro-macro level studies have highlighted the importance of both the individual characteristics and the institutional context for maternal employment but also for influencing gender culture on the societal level. Particularly with respect to childcare provision, a large body of international economic and sociological literature has shown the importance of the role availability and childcare service costs play in gender inequalities in paid and domestic work.

Given the focus of this thesis, the following two subsections summarise previous research on maternal employment, focusing particularly on the relationship with individual-level gender ideologies and macro-level childcare provision. The first subsection introduces the concept of gender ideologies in more detail, followed by a presentation of previous research on, firstly, the association between gender ideologies and maternal employment and, secondly, important determinants in the formation and change of individual-level gender ideologies, particularly with respect to policy changes. The second subsection focuses on previous studies that investigate the effect of childcare provision on maternal employment. Finally, the third subsection summarises the most important gaps in the literature and introduces the research questions of this thesis.

3.1 Previous Research on Gender Ideologies

This part starts with an introduction to the applied concept of gender ideology and then summarises findings on the relationship between gender ideologies and maternal employment. The second part presents previous research that aims at explaining the formation and change of gender ideologies, focusing particularly on the role of family policy change. In both parts, previous research is grouped with respect to the applied empirical design, distinguishing between cross-sectional approaches and longitudinal studies.

The Concept of Gender Ideology and its relation with Maternal Employment

Within the large number of relevant sociological and economic literature, individual-level gender ideologies have been found to correlate with related behaviour (Fishbein and Ajzen, 1975), such as the gender division of domestic labour and parental care (e.g., Cunningham, 2001; Duvander, 2014; Nitsche and Grunow, 2016; Schober and Scott, 2012; see Davis and Greenstein, 2009 for an overview), fertility and family trajectories (e.g., Arpino, Esping-Andersen and Pessin, 2015; Hofäcker and Chaloupková, 2014), as well as maternal labour supply (e.g., Bertrand, Kamenica and Pan, 2015; Kan, 2007; Kangas and Rostgaard, 2007; Khoudja and Fleischmann, 2015;

Schober and Scott, 2012; Scott, 1999; Uunk, Kalmijn and Muffels, 2005; see Steiber and Haas, 2012 for an overview). Thereby, numerous terminologies have been employed to describe individual's support for gender spheres and, hence, the roles ascribed to parents and the institutional framework, particularly with respect to the division of paid and domestic work. Among the most common terms used across various sociological journals are *gender ideologies* and *gender role attitudes* (Davis and Greenstein, 2009). Following this tradition, the thesis utilises these two notions, and this subsection introduces the relevant concepts. The second part of this section then briefly summarises research on the relationship between gender ideologies and maternal employment.

Social psychology research has conceptualised how behaviour is driven by three psychological constructs: ideologies, values, and attitudes. Within this research stream, the term *attitudes* refers to “tendencies to evaluate an object positively or negatively” (Maio *et al.*, 2003: 284). Hence, attitudes are considered to reflect beliefs about specific situations and objects (Lewis, 2010), while *values* describe more abstract and stable ideals and preferences that are assumed to serve as important guidelines to individual behaviour (Lewis, 2010; Maio *et al.*, 2003). *Ideologies* denote a system of attitudes and values and therefore refer to the most abstract and most one dimensional construct compared to attitudes, which cover a wider range of objects or situations (Maio *et al.*, 2003).¹⁸ Accordingly, *gender ideologies* span values and beliefs about separate spheres and roles for men and women within society, particularly with respect to the ideal family form and the division of paid and unpaid work and care among couples. Hence, these ideologies are linked to *gender role attitudes* that negatively or positively evaluate the individual-level of support for specific gendered spheres in various contexts, and especially with respect to the issue of paid and unpaid work and care (Davis and Greenstein, 2009). Some authors conceptualise gender ideology as a more general but somehow one dimensional system of beliefs, but view gender role attitudes as multidimensional as they touch upon on various areas of daily life (Davis and Greenstein, 2009; Kroska, 2000).

To conceptualise and to distinguish between individual-level gender ideologies on the micro- and gender ideologies on the societal, i.e. macro-level, this thesis follows previously established concepts in earlier studies on gendered paid and domestic work. Accordingly, gender ide-

¹⁸ Previous research has revealed many different ideologies, such as political ideologies, like liberalism or social democracy, as well as cultural and social ideologies, including individualism, multiculturalism or gender ideologies. These ideologies span a large variety of attitudes and values which mutually affect each other. Hence, smaller changes in ideologies are assumed to induce numerous attitudinal changes as a variety of more concrete issues or situations start to be evaluated differently.

ologies on the macro-level are considered “as widespread societal beliefs that legitimate gendered power difference and inequality” (Grunow and Veltkamp, 2016: 7, Kroska, 2000). These beliefs are reflected in the dominant model of couples’ division of paid and domestic work but also in the institutional framework, especially in work-family policies. Previous literature has subsumed these societal beliefs or values and the interrelation with the policy framework under *cultural factors* (Steiber and Haas, 2012), *work-care norms*, *work-care arrangements* (Pfau-Effinger, 1998) or *gender culture* (Grunow and Evertsson, 2016). Hence, in this thesis, macro-level gender ideologies are referred to as **gender culture**, while **individual gender ideologies** refer to individuals’ level of support for the division in paid and domestic work based on the belief in (multiple) gendered separate spheres (Grunow and Veltkamp, 2016). In contrast, the term **gender role attitudes** is mostly applied to refer to measures in empirical research which aim at capturing the multi-dimensional concept of individual-level gender ideologies through standardised item batteries (see Davis and Greenstein, 2009 for an overview). Overall, beliefs in gendered spheres and, hence, in the gendered division of paid and unpaid work and care are referred to as more traditional gender ideologies, while more egalitarian or less traditional gender ideologies describe beliefs that value a more equal division of paid and domestic work among men and women.

While some authors have argued that multidimensional gender role attitudes do not comfortably fall onto a continuum of a traditional and egalitarian gender ideology (e.g., Knight and Brinton, 2017), this thesis follows previously applied concepts but concentrates only on gender ideologies related to maternal employment. Accordingly, due to an overall decline in more traditional gender role attitudes, various gender ideologies have emerged, including a variety of forms of egalitarianism.¹⁹ As a result of this, increasingly egalitarian beliefs within the context of paid employment might go hand in hand with persistent traditional gender ideologies within the context of care, such as the ideology of intense parenting (Grunow and Veltkamp, 2016). While this thesis acknowledges the mix of different egalitarian and traditional gender ideologies, it, however, narrows the perspective and concentrates only on gender ideologies and gender role attitudes with respect to the sphere of maternal employment. Thereby, it relies on the continuum of traditional and less traditional gender ideologies much in the same way as previous research on gender ideologies and gender role attitudes focusing on the gendered division of paid and domestic work (see Davis and Greenstein, 2009 and Steiber and Haas, 2012 for an overview).

¹⁹ In terms of empirical research, Davis and Greenstein (2009) have tried to conceptualise the frequently applied measures which aim to capture individual levels of support for gendered spheres. The authors distinguished the following six categories, highlighting the multidimensional approach of the concept of gender role attitudes. These categories focus predominantly on the spheres of the gendered division of paid and family work and include: (1) the primacy of the breadwinner role, (2) working women and relationship quality, (3) motherhood and the feminine self, (4) the belief in gendered separate spheres, (5) household utility and (6) the acceptance of male privilege.

But how is the concept of gender ideology related to maternal employment behaviour? To investigate this association on the macro- or micro-level, previous research has either exploited aggregated individual-level gender role attitude items as a measure of gender culture (e.g., see Heyne, 2017 for an overview), or applied a micro-level approach using various individual-level gender role attitudes items (e.g., Banaszak, 2006; Kangas and Rostgaard, 2007; Khouidja and Fleischmann, 2015). Both groups of studies have shown that less traditional gender ideologies are positively associated with maternal employment, while pointing to the importance of country differences in this relationship. For Germany, previous studies consistently found less traditional gender ideologies among East Germans compared to West Germans (Adler and Brayfield, 1997; Banaszak, 2006; Bauernschuster and Rainer, 2012; Lewis, 2010). However, as outlined earlier, these micro- and macro-level approaches come with several disadvantages for disentangling employment differences due to compositional effects on the individual- or household-level and differences in contextual factors.

In order to overcome the disadvantages of micro- or macro-designs, several cross-national studies have applied a micro-macro approach by combining (repeated) cross-sectional individual-level data with contextual measures, including aggregated measures of individual-level gender ideologies, to better disentangle compositional differences at the individual-level from country-variation at the macro-level. Overall, these studies have shown a positive correlation also between less traditional gender ideologies on the societal level and maternal employment behaviour (e.g., Böckmann, Misra and Budig, 2015; Kangas and Rostgaard, 2007; Sjöberg, 2004), as well as with related employment outcomes such as the motherhood pay gap (e.g., Budig, Misra and Boeckmann, 2012). Some of these studies thereby found considerable variation in the relationship between maternal employment and family policies with respect to gender ideologies (e.g., Budig, Misra and Boeckmann, 2012). However, by only using aggregated attitudinal measures on the macro-level without controlling for attitudinal differences on the individual-level, these studies fail to completely disentangle compositional differences due to the variation in attitudes on the individual-level from cultural or policy variations at the macro-level. Thus, these cross-national studies were unable to identify any causal effects as the positive correlation between gender ideologies and maternal employment might be either the result of selection processes into employment due to less traditional attitudes, or because mothers adjust their attitudes according to their employment participation.

Studies based on longitudinal data have tried to estimate a causal relationship, and thereby have shown that less traditional gender ideologies impact positively on maternal employment and vice versa (e.g., Berrington *et al.*, 2008; Bertrand, Kamenica and Pan, 2015; Himmelweit and

Sigala, 2004; Schober and Scott, 2012; van Putten, Dykstra and Schippers, 2008), providing additional support for previous cross-sectional approaches. Due to the lack in harmonised individual-level panel data, only a few comparative studies have applied a longitudinal design to provide additional support for the positive relationship between less traditional gender ideology and maternal employment across different contexts (Uunk, Kalmijn and Muffels, 2005). With respect to Germany, Gangl and Ziefle (2015) have applied a longitudinal approach and found that a stronger work-commitment positively affects women's labour force participation. However, at the same time, various extensions of parental leave benefits somewhat lowered mothers' work-commitment between 1990 and 2004. Similarly, some longitudinal studies have additionally shown that the relationship seems to be recursive (Berrington *et al.*, 2008; Cunningham, 2008; Himmelweit and Sigala, 2004; Schober and Scott, 2012), hence, these results point to the importance of intra-cohort change of gender ideologies within the life course.

In sum, previous results emphasise the importance of gender ideologies for understanding persistent gender differences in the division of paid and domestic work. However, while earlier studies have partially evaluated how gender ideologies are formed during early parental socialisation and vary depending on the contextual factors of different welfare regimes, it remains less clear whether gender ideologies are subject to change over the life course. With panel data becoming increasingly available, more recent research has tried to investigate whether life course transitions, as well as policy changes, are also associated with changes in gender ideologies within the life course.

The Formation of Gender Ideologies over the Life Course

This part presents previous research that aims at investigating the formation and change of individual-level gender ideologies, focusing particularly on the role of changes in the institutional context.

While modernisation theory has argued that economic development in modern societies goes hand in hand with change towards less traditional gender ideologies and, hence, convergence across countries (Inglehart and Norris, 2003), previous empirical research has aimed at explaining the formation and change in ideologies through two main mechanisms: Cohort replacement, or inter-cohort change, and the approach of intra-cohort change. According to cohort replacement theory, younger cohorts replace older cohorts with more traditional ideologies (e.g., Baxter *et al.*, 2015; Bolzendahl and Myers, 2004; Brooks and Bolzendahl, 2004; Lee, Alwin and Tufis, 2007; Sjöberg, 2004; Steiber and Haas, 2009). This approach implicitly assumes that beliefs and practices regarding work-family articulations are formed during childhood in response to the

overall context of parental, as well as welfare regime socialisation (Goerres and Tepe, 2012; Banaszak, 2006), and thus, considers individual-level gender ideologies as largely stable over the life course (e.g., Banaszak, 2006; Lee, Alwin and Tufis, 2007). Secondly, changes in gender ideologies are assumed to result from intra-cohort change that occurs due to aging and period effects as well as important life course transitions (e.g., Lee, Alwin and Tufis, 2007; Steiber and Haas, 2009). While the first sphere of literature concentrates on the influence of institutions in the long run, the second instead examines ideology change by focusing on short-term changes on the individual-level that – among other – are induced by changes in the institutional context.

With respect to the institutional context, several comparative studies of a small number of countries or cultural contexts have hinted at the cohort-specific importance of family policy institutions in shaping opportunity structures and gender ideologies regarding maternal employment and adequate care for young children (e.g., Banaszak, 2006; Bauernschuster and Rainer, 2012; Sjöberg, 2004), but also for influencing gender culture within society (e.g., Böckmann, Misra and Budig, 2015; Grunow and Evertsson, 2016; Sjöberg, 2004).

Considering Germany, numerous studies have exploited the reunification of the formerly divided Germany, in order to investigate the relationship between gender ideologies and institutional context in a comparative manner, providing positive evidence for inter-cohort change of gender ideologies. With Germany's different institutional context prior to the reunification in 1990, this framework serves as a "natural experiment" for investigating the determinants and the potential convergence of gender ideologies after a major institutional change. Overall, the predominantly cross-section studies based on ALLBUS data, while controlling for various occupational and family characteristics, have shown persistent East-West differences in gender ideologies, with less traditional gender role attitudes among East Germans (Adler and Brayfield, 1997; Banaszak, 2006; Bauernschuster and Rainer, 2012; Lee, Alwin and Tufis, 2007). These studies found East-West disparities to be particularly pronounced for mothers, and stronger for items focusing on maternal employment or the combination of work and family compared to items on marital roles (Adler and Brayfield, 1997; Banaszak, 2006). Thus, these findings were in line with theoretical expectations on strong welfare regime socialisation with respect to maternal employment prior to reunification, particularly in East Germany.

Some studies, however, have also pointed to slightly increasing East-West differences in gender ideologies after the reunification and, therefore, challenge the assumption of stable ideologies over the life course and cohort replacement based convergence (e.g., Banaszak, 2006; Bauernschuster and Rainer, 2012; Lee, Alwin and Tufis, 2007). Banaszak (2006) explains persistent and somewhat stronger East-West differences between 1991 and 2004 as the long-term effects of regime socialisation and compositional changes in the cross-sectional data, particularly

with respect to increased employment transitions due to improving labour market opportunities in East Germany. However, Bauernschuster and Rainer (2012) found that the persistent and even increasing East-West differences in gender ideologies are not correlated with the institutional context, such as labour markets, economy or childcare provision. However, distinguishing by cohorts revealed increasing gaps among the oldest cohorts in contrast to relatively stable or even converging East-West differences among younger cohorts. Similarly, Lee, Alwin and Tufis (2007) identified larger intra-cohort changes among East Germans, whereas among West Germans, intra- and inter-cohort changes seemed to have equal power to explain changes in gender ideologies over time. However, although these studies have highlighted the influence of the institutional framework, with only repeated cross-sectional data at hand, these studies failed to disentangle changes in gender ideologies within cohorts from individual-level changes over the life course.

With the lack of other regime changes comparable to the German reunification, comparative or international studies on single countries have aimed at exploring the relevance of the institutional framework for long-term changes in gender ideologies. A few authors have attempted to disentangle cultural change due to cohort replacement and changes over the life course, by controlling for period effects or analysing different periods with the help of cross-sectional data (e.g., Bolzendahl and Myers, 2004; Davis and Greenstein, 2009; Kraaykamp, 2012). By decomposing inter-cohort and intra-cohort effects, Kraaykamp (2012) shows considerably larger intra-cohort effects compared to cohort-change for the increase in gender-egalitarian views in the Netherlands. Hence, these repeated cross-sectional studies have provided additional support for the importance of intra-individual changes in gender ideologies. More recent comparative studies combine (repeated) cross-sectional data with more direct measures of family policies to better disentangle compositional differences at the individual-level, and cultural or policy variations at the macro level (Kangas and Rostgaard, 2007; Sjöberg, 2004). Sjöberg (2004) found that more generous family policy institutions which support the dual-earner family, were associated with more egalitarian gender ideologies at the individual-level. However, as the majority of these studies again used only (repeated) cross-sectional data, they face similar problems to those outlined earlier.

Given the disadvantages of cross-sectional data, some single country longitudinal studies of the UK, Australia, and Germany have tried to estimate a causal relationship and provided evidence of changes in gender ideologies due to changes in the institutional framework or major life course transitions, particularly with respect to childbirth (Baxter *et al.*, 2015; Berrington *et al.*, 2008; Schober and Scott, 2012). The extent of change after childbirth appeared to correlate with labour market transitions and childcare choices and the extent to which these are in line

with prenatal ideologies or constrained by economic and institutional factors (Berrington *et al.*, 2008; Schober and Scott, 2012). These longitudinal studies, however, were unable to consider direct measures of changes in institutional context, such as childcare services, over time and, hence, did not investigate whether and through which channels family policy reforms may alter individual gender ideologies in the short-term. Considering the cultural impact of the institutional framework on return-to-work behaviour in Germany, Grunow and Müller (2012) found that mothers who were born in the East, but had been living several years in the West prior to childbirth returned to the labour market more slowly than their East German counterparts did, but faster than other West German mothers. The authors take this as a sign of moderately stable socialisation, but also cultural adaptation to a different institutional and cultural setting in West Germany, particularly to the lack of childcare provision. However, the authors did not directly investigate a change in gender ideologies with respect to the institutional framework. Additionally, because they focused particularly on an institutional change for a selective group of east-west mobile mothers in the period between 1992 and 2002, they did not directly capture a relevant change in childcare provision in East or West Germany such as the increase in childcare services since 2005.

To date, only a few recent studies have examined the short-term impact of changes in work-family policy institutions on changes in gender ideologies. Based on a survey-experimental design, Pedulla and Thebaud (2015) showed that the majority of young adults preferred an egalitarian relationship structure. However, women were significantly more likely to choose a more gender-traditional arrangement when facing institutional constraints without supportive policies, such as gendered workplace cultures and policies, which constrain the equal sharing of breadwinning, housework, and care giving. With regard to childcare policies, Ellingsæter, Kitterød and Lyngstad (2017) found that a period of substantial increase in childcare availability in Norway has been associated with a considerable increase in the acceptance of formal childcare among all socio-economic groups and in all parts of the country. Unfortunately, they only examined repeated cross-sectional data at two observation times and were unable to consider a direct measure of childcare provision over time.

With respect to Germany, previous research has predominantly focused on the association between changes in parental leave policies and gender ideologies. By applying difference-in-difference estimators, Gangl and Ziefle (2015) revealed that several reforms increasing the generosity of parental leave entitlements in Germany during the 1990s and early 2000s were associated with role exposure and norm setting effects. Hence, they provide evidence that more generous

parental leave policies resulted in a decline in mothers' work commitment and labour force participation. Similarly, Unterhofer and Wrohlich (2017) have exploited a quasi-experimental setting of the parental leave reform that occurred in 2007 (see subsection 2.2). They found the introduction of the father' quota to be positively associated with changes towards less traditional gender ideologies among respondents whose son had a child after the reform, suggesting that the reform induced indirect effects on changes in gender ideologies based on social interaction.

In sum, the previous research presented in this subsection has found a positive association between supportive work-family policies and less traditional gender ideologies. While cross-sectional studies were the first to point to differences in gender ideologies across countries and different institutional frameworks, longitudinal studies have provided the first evidence on intra-individual change in gender ideologies in response to major changes in the institutional framework. Considering recent major shifts in childcare and parental leave policies in Germany, it comes somewhat as a surprise that none of the recent studies has investigated whether the expansion in childcare services is associated with individual short-term change in gender ideologies.

3.2 Previous Research on Childcare Provision and Maternal Employment

This subsection presents results on the relationship between formal childcare services and maternal employment, focusing on public childcare for under-threes. While the first part summarises the literature with respect to employment effects of public childcare availability, the second part briefly presents previous investigations of socioeconomic disparities in childcare take-up and, thus, differences in the relationship between childcare provision and maternal employment. Again, the presented findings are grouped with respect to the studies' applied empirical design, distinguishing mostly between cross-sectional approaches and longitudinal studies.

To investigate the effect of formal childcare on maternal employment, studies have increasingly linked large-scale data on the individual- and household-level with macro-level childcare indicators. Previous research has thereby either focused on childcare cost, particularly in the U.S., or the availability of childcare services (e.g., see Morrissey, 2017 for an overview). In most European countries, including Germany, the latter had been particularly scarce, especially at subsidised prices. Hence, a considerable amount of studies have predominantly focused on the relationship between maternal employment and childcare availability, rather than childcare costs (Del Boca and Vuri, 2007). These approaches have either relied on regional childcare variation,

particularly by using data from the U.S. or comparative studies across Europe, or exploited temporal variation induced by childcare policy reforms.

Most of the comparative studies applying a micro-macro approach with cross-sectional data (e.g., Berninger, 2009; Böckmann, Misra and Budig, 2015; Budig, Misra and Boeckmann, 2015; Kangas and Rostgaard, 2007; Keck and Saraceno, 2013; Misra, Budig and Boeckmann, 2011; Pettit and Hook, 2005; Ruppanner, 2013; Stier, Lewin-Epstein and Braun, 2001) or repeated cross-sectional data (e.g., Budig, Misra and Boeckmann, 2012; Steiber, Berghammer and Haas, 2016; Steiber and Haas, 2010), have established a positive relationship between childcare availability or childcare costs and maternal employment (see Müller, Sengül and Wrohlich, 2015 or Morrissey, 2017 for a detailed overview). Particularly with respect to Germany, East-West disparities in maternal employment have been frequently explained as the result of lower levels of childcare provision in West Germany (e.g., Böckmann, Misra and Budig, 2015; Budig, Misra and Boeckmann, 2015; Budig, Misra and Boeckmann, 2012; Berninger, 2009; Landivar, 2015; Pettit and Hook, 2005; Ruppanner, 2013; Stier, Lewin-Epstein and Braun, 2001; Stier, Lewin-Epstein and Braun, 2012).

However, these cross-sectional studies did not sufficiently account for unobserved heterogeneity and, hence, did not consider potential selection effects into family policy use and maternal employment. While it is difficult to assess whether some studies did make use of comparable macro indicators across countries (e.g., Budig, Misra and Boeckmann, 2012; Budig, Misra and Boeckmann, 2015), others have only used joint policy indicators or regime typologies (e.g., Uunk, 2015) and, hence, have failed to disentangle whether childcare policies in particular or other important work-care contextual factors support maternal employment more effectively. With respect to Germany, some comparative studies did not even distinguish between East and West Germany and, hence, failed to account for important contextual differences (e.g., Hook and Pettit, 2016; Hook, 2015; Pettit and Hook, 2005; Ruppanner, 2013; Stier, Lewin-Epstein and Braun, 2001; Stier, Lewin-Epstein and Braun, 2012; Uunk, 2015). Furthermore, it can be argued that cross-sectional differences in childcare provision are likely to be endogenous (Müller, Sengül and Wrohlich, 2015) as in regions with high maternal employment rates, childcare coverage is likely to be higher (Andronescu and Carnes, 2015). Additionally, it has been critically argued that more work oriented parents could happen to live in regions which offer higher childcare provision as well as different types of childcare services (Müller, Sengül and Wrohlich, 2015; Schober and Spieß, 2015). Consequently, longitudinal studies that rely predominantly on within-variation in childcare provision based on a major policy reform seem particularly suited for a more thorough investigation of the relationship between childcare provision and maternal employment (Müller, Sengül and Wrohlich, 2015).

International studies based on longitudinal data and exploiting exogenous quasi-experimental reform variation in childcare coverage within single countries, have confirmed that the availability of childcare services seems to be particularly relevant to enable mothers to return to employment faster and preferably to full-time positions after childbirth (see Morrissey, 2017 for an overview). However, some studies found larger effects in contexts where childcare availability was low prior to an expansion (e.g, Brilli, Del Boca and Pronzato, 2016 on Italy). In contrast, other studies revealed small or no significant effects (Havnes and Mogstad, 2011 on Norway; Lundin, Mörk and Öckert, 2008 on Sweden). These small or insignificant estimates were explained as the result of heterogeneous reform effects or of substitution effects of households using public or publicly subsidised childcare instead of informal care or costly private formal care (Havnes and Mogstad, 2011).

With respect to comparative approaches, only a few longitudinal micro-macro studies exist that provide evidence on the positive impact of childcare provision on maternal employment or other outcomes that are closely related, such as gender and motherhood wage gaps (Halldén, Levanon and Kricheli-Katz, 2016; Keck and Saraceno, 2013; Uunk, Kalmijn and Muffels, 2005). However, similar to frequent comparative cross-sectional approaches, these few studies do not differentiate between East and West Germany and, hence, do not take into account considerable differences in contextual factors, particularly childcare provision. Consequently, especially with respect to Germany, single country-studies and studies focusing on single policies prove useful in accounting for the persistent within-country variation in childcare policies and opportunity structures.

With respect to Germany, a large number of studies have provided mixed evidence on the relationship between childcare and maternal employment in the period before the start of the childcare expansion. The majority of studies rely on Socioeconomic Panel data (SOEP) (Wagner, Frick and Schupp, 2007). By focusing on West Germany, and thus, a context with an exceptionally low level of, and small variation in, childcare provision prior to the expansion, studies that made use of single SOEP waves showed no statistically significant association between childcare and maternal employment (Büchel and Spieß, 2002; Kreyenfeld and Hank, 2000). In contrast, studies that focused on a wider period, including data from several years up to 2009, and thus after the start of the expansion, found the provision of childcare services to be positively associated with maternal employment in East and West Germany (Krapf, 2014; Kreyenfeld and Krapf, 2010). However, these studies only made use of cross-sectional variation.

Contrary, previous longitudinal studies have generally provided evidence on the positive association between public childcare and maternal employment in Germany. By investigating

return-to-work behaviour for the period between 1992 and 2002, Grunow and Müller (2012) found county-level provision of childcare for under-threes to be positively associated with a faster return to work among mothers in the East and West. Similarly, by focusing again on West Germany and the period between 2002 and 2008, Felfe and Lalive (2014) found higher childcare provision to be positively associated with a higher probability of childcare take-up. Bergemann and Riphahn (2015) focused on the employment effects of the parental leave reform in 2007, thus comparing maternal labour market returns for mothers with a birth before and after the introduction of the new income-related and shortened leave scheme. Besides the overall positive reform effect on shorter interruption durations, they also found a positive effect of greater childcare provision. However, the results seemed to be driven by returns to part-time employment. Unfortunately, the authors did not differentiate between East and West German mothers, and did not explain which county-level measure of annual childcare information they had used for the period before the parental leave reform in 2007.

In sum, these earlier studies have relied on a very low exogenous within-county-level variation in their childcare measure, particularly in West Germany. As annual administrative childcare data have only become available with the start of the expansion in 2006 (BMFSFJ, 2008), earlier studies had made use of childcare data that were provided only once every four years and cover a period with only few variation in childcare provision. Although childcare provision increased in some federal states, however, overall increases remained below 5 percentage points between 2002 and 2006 (id.). Nevertheless, for East Germany, the assumption of increased childcare capacities over time (e.g., Grunow and Müller, 2012) might be problematic. Although generally childcare provision increased significantly, reaching an average of 6 percentage points, and even 15 percentage points in Thuringia, at the same time some federal states such as Brandenburg and Saxony-Anhalt continued to reduce capacities by 4 and 6 percentage points (BMFSFJ, 2008), following the tradition of the reductions carried out during the 1990s after reunification.

Considering the period after the start of the childcare expansion in 2005, among mothers with under-threes employment rates increased considerably from 43 to 53 per cent in West Germany, and from 47 to 65 per cent in East Germany between 2006 and 2016 (Federal Statistical Office, 2017). These increases seem to be particularly pronounced among mothers with a child aged between one and three years: While in 2006, employment rates of mothers with a child between one and two were about 32 per cent, and between two and three years about 41 per cent, these shares increased to 43 and 58 per cent by 2015 (BMFSFJ, 2017a). Hence, the question arises of

whether these increases can be attributed to the expansion of childcare services. However, to date, only a few studies have focused on the period of increased childcare services.

Earlier micro-simulations of the childcare reform have predicted an increase in maternal employment and childcare take up due to the increase in childcare services (Bonin *et al.*, 2013; Haan and Wrohlich, 2011) and the legal entitlement to a childcare slot for all children aged one and over (Müller and Wrohlich, 2016). By controlling for various individual- and contextual determinants, Haan and Wrohlich (2011) simulated positive employment effects for both East and West Germany mothers. In line with these results, Bonin *et al.* (2013) predicted a particularly pronounced increase in employment for mothers with two to three year old children, but also for mothers with low or medium incomes. With respect to the introduction of a legal right to childcare from age one, Müller and Wrohlich (2016) predicted significant positive effects on childcare take-up, maternal employment and wages. This would be in line with the positive effects found after the introduction of a legal right to childcare from age three in 1996 (Bauernschuster and Schlotter, 2015). However, in total, Müller and Wrohlich (2016) estimated a smaller positive effect due to the counteracting effects of the care allowance (*Betreuungsgeld*), which, today however, is no longer in force (see subsection 2.2).

Aside from the micro-simulation studies, to date, evidence on the relationship between increased childcare provision and maternal employment based on survey data is limited and, overall, mixed. By using cross-sectional variation for 2010 and 2011, Schober and Spieß (2015) found a positive association between childcare quality and the probability of maternal employment, but no significant effect of full-time provision for under-threes once childcare quality was controlled for. More precisely, the study found East German mothers whose childcare services provided smaller group sizes to be more likely to be employed and to extend their working hours compared to mothers in counties with larger childcare groups. In contrast, the authors did not find a significant association for West Germany, which may be explained by the persistently restricted access to childcare due to lower coverage levels. The formal qualification levels of staff, and child-teacher ratios were not significantly related to maternal employment. Additionally, a more recent, and so far unpublished study, focuses only on West Germany (Müller, Sengül and Wrohlich, 2015). By using Socioeconomic Panel Study and Microcensus data from 2007 to 2011, and applying different causal estimation strategies such as IV, difference-in-difference, and county-level fixed effects models, the authors aim at estimating the causal effect of increased childcare provision on maternal employment. However, by applying rigorous empirical designs that are based exclusively on within-county-level variation in childcare provision, the authors did not find any statistically significant association. This contradicts results from a study based on a quasi-experimental design, revealing positive employment effects, particularly among

mothers with children aged 2–3 years and, hence, confirming earlier micro simulations (Geyer, Haan and Wrohlich, 2015).

Finally, a few recent studies have investigated the link between increased childcare provision and other outcomes related to maternal employment. By analysing the association between childcare and the subjective well-being of mothers, Schober and Stahl (2016) indicated that greater full-time provision was positively associated with maternal satisfaction with family life and life overall. However, while childcare provision did not seem to have a statistically significant effect on satisfaction levels for West German women, a significant relationship was found for East German mothers, irrespective of their employment status. Additionally, two economic studies found the increase in childcare services to be positively linked to a change in family structure, i.e. an increase in divorce and single parenthood (Bauernschuster and Borck, 2016), as well as higher fertility due to additional higher order births (Bauernschuster, Hener and Rainer, 2016).

While previous literature suggests overall positive effects of public childcare provision on maternal employment, several studies have also indicated that the association varies according to socioeconomic characteristics (see Müller, Sengül and Wrohlich, 2015 for an overview). When it comes to under-threes, children of older age, children without a migration background, and children of single mothers or mothers with higher levels of educational attainment are most likely to attend childcare services (e.g., Becker, 2009a; Becker, 2010; Schober and Stahl, 2014; Spieß, Berger and Groh-Samberg, 2008; Stahl and Schober, 2017).

Particularly in the first year after birth, parents are likely to opt for exclusive parental care, which is supported by the paid parental leave of about 12 to 14 months, whereas children aged older than one are more likely to attend childcare (e.g., Felfe and Lalive, 2014), particularly in East Germany (Schober, 2014). In 2012, about 60 and 20 per cent of one year old children attended childcare in East and West Germany, respectively. This East-West difference remains persistent also for two-year olds (*id.*). In addition, recent parental surveys provide further evidence on considerable East-West differences in the preferred child's age for childcare enrolment and mothers' return to employment after birth, with East German mothers revealing a preference for a much younger age. By using 2011 PASS data (Panel Labour Market and Social Security), Lietzmann and Wenzig (2017) found that East German mothers prefer the child to be about 2 years and 6 months before they return to part-time employment, compared to an preferred age of about 3 years and 7 months among West German mothers. With an average age of about 4 years and 2 months in the East, compared to 7 years and 8 months in the West, even stronger differences were revealed with respect to the preferred age for a return to full-time employment.

Similarly, East Germans consider full-time care to be appropriate for children aged 3 years and 4 months compared to the much higher average age of about 5 years and 6 months in West Germany. In sum, the results point to the importance of selection effects with respect to childcare take-up and child's age.

Furthermore, empirical studies have shown considerable variation in childcare take-up according to mothers' educational attainments and household incomes, with mothers with lower educational levels or lower household incomes being less likely to take up formal childcare (e.g., Felfe and Lalive, 2014; Haan and Wrohlich, 2011; Krapf, 2014; Kreyenfeld and Krapf, 2010; Schober and Spieß, 2013; Schober and Stahl, 2016; Stahl and Schober, 2017; Wirth, Heike and Lichtenberger, 2012). Thereby, disparities as well as determinants in childcare use seem to vary between East and West Germany (e.g. Kreyenfeld and Krapf, 2010; Schober and Stahl, 2014; Schober and Spieß, 2013). Recent research has pointed to increasing socioeconomic differences in childcare take-up, according to which, since 2006, it is mothers with low education levels, single mothers, or parents with a migration background who were increasingly less likely to take up formal childcare (Schober and Stahl, 2014). For the period of 2007 to 2013, Stahl and Schober (2017) found growing educational disparities in maternal employment and childcare take-up in East and West Germany as compared to earlier periods, with a more pronounced increase in employment among mothers with at least vocational qualifications. At the same time, exclusive parental care increased especially for mothers with low education levels, which is explained by their consistently lower employment prospects, particularly in East Germany (id.) This longitudinal study, however, was unable to consider more control variables to account for important individual factors such as mothers' work experience before childbirth, or contextual factors such as labour market opportunities and childcare provision.

In sum, previous research has pointed to the positive effects of childcare provision, with more pronounced effects among some subgroups of mothers. With regard to the recent childcare reform in Germany, the little empirical evidence that exists is, however, inconclusive on whether higher levels of childcare provision have been positively associated with maternal employment in both East and West Germany and across various socioeconomic backgrounds.

3.3 Summary on Gaps in Previous Research and this Thesis' Research Questions

This section has presented research results on gender ideologies and public childcare provision and their relationship with maternal employment, as well as results on how policy changes may alter gender ideologies within the life course, focusing particularly on family policies. In sum, previous research has provided positive evidence on the link between public childcare provision

and maternal employment, and on the transition to less traditional gender ideologies due to family policies that facilitate the combination of work and care.

While cross-sectional studies were the first to point out the differences in gender ideologies across countries and different institutional frameworks, longitudinal studies have provided first evidence on intra-individual change in gender ideologies in response to major changes in the institutional framework. However, to date, few studies have investigated whether and through which channels family policy reforms may alter gender ideologies in the short-term. Considering the dramatic increase in childcare services in Germany, it comes as somewhat of a surprise that, to date, no study has investigated the short-term impact of childcare reforms on gender ideologies within the life course in East and West Germany.

Furthermore, by exploiting regional and time variation in childcare provision for under-threes, most international studies have hinted at the importance of public, or publicly subsidised, childcare for maternal employment (see Morrissey, 2017 for an overview). However, most of these studies analysed childcare coverage in contexts dominated by for-profit providers, hence, their findings may not be applicable to the German context of optional familialism. Moreover, more recent empirical evidence is mixed on whether the childcare expansion has increased maternal employment in Germany. Studies that either simulated the employment effects of increased childcare or studies that have focused on other outcomes, both overall found significant effects of increased public childcare. Conversely, recent evaluation studies that aim at applying rigorous models of causal inference, have found no effect for West Germany when considering the period between 2007 and 2011. Consequently, the question of whether increased childcare provision has been positively associated with maternal employment in East and West Germany has not yet been satisfactorily answered.

Given these gaps in previous research, this thesis aims at investigating whether the provision of childcare services for under-threes is positively associated with maternal employment and a change towards less traditional gender ideologies among parents with young children. More precisely, three empirical studies seek to analyse, *firstly*, whether greater childcare availability has facilitated short-term change in individual-level gender ideologies among parents with young children, and thus, has increased the acceptance of maternal employment due to role exposure or normative policy effects (Chapter 2). This study develops a conceptual framework to explain the short-term change in gender ideologies within the life course in order to investigate how institutional changes, in this case a significant increase in childcare services, might facilitate a change in gender ideologies in the short-term. *Secondly*, it analyses whether higher levels of childcare provision were associated with shorter employment interruptions amongst

mothers of under-threes in the time period studied (Chapter 3). *Thirdly*, the thesis investigates whether the association between childcare provision and maternal employment has been more pronounced among certain subgroups of mothers, focusing on mothers' educational attainments, and maternal full- or part-time employment, as well as differences in the relationship depending on whether the childcare available is full-time only or provision that includes both full- and part-time places (Chapter 4).

By empirically investigating these three overall research questions, the studies aim at contributing to the previous literature in various ways. Firstly, in line with the macro-micro approach, this thesis investigates the change in gender ideologies, as well as maternal employment behaviour with regard to increased childcare provision by taking into account individual- and household-level factors, as well as the regional context. Therefore, all three empirical studies link rich individual- and household-level panel data from different sources with administrative records on time-varying childcare provision and additional labour market characteristics at county-level.²⁰

Secondly, by estimating the associations between childcare availability and the formation of gender ideologies and maternal employment separately for East and West Germany, the studies examine the relationships in two contexts that differ remarkably in the acceptance and use of formal childcare and maternal employment prior to the start of the expansion and with respect to the historic differences that existed prior to reunification and the reform period. While in comparative family research, Eastern Europe has become an important focus point (Javornik, 2014; Lovász, 2016; van der Lippe and van Dijk, 2002), Germany provides a unique opportunity to study the influence of family policies in two contexts that reflect the historical differences of both Eastern and Western European countries. Hence, this thesis exploits the potential of traditional comparative studies by analysing the effect of a family policy reform in two different contexts within one country.

Thirdly, this analysis extends previous studies that have examined the change in gender ideologies in response to major changes in the institutional framework, or that estimated the employment effects of the recent increase in childcare provision by investigating whether these relations differ according to educational attainment. Thus, this thesis adds to the perspective of heterogeneous life course effects with respect to socioeconomic differences.

²⁰ To date, the legal right to childcare for all children aged one year or older seems not easily enforceable, as only few parents have taken legal action against regional authorities. In principle, in 2016, the top court decided that employed parents are entitled to financial compensation (Financial Times, 2016). However, due to only few observations of mothers with a one-year old child after August 2013, the studies focus on the gradual expansion of childcare services.

Fourthly, on the one hand, this thesis contributes to the previous literature on the labour market consequences of the childcare expansion by disentangling mothers' employment behaviour and analysing the length of the family related employment interruption after childbirth. On the other hand, it also focuses on full- and part-time employment participation, and the number of weekly working hours. Thereby, the studies extend previous findings by differentiating between first and second births to account for different labour market behaviour related to a change in family work and opportunity costs. Lastly, the analyses extend previous contributions which have focused on the childcare expansion by distinguishing between the availability of full-time childcare services compared to provision that includes both full and part time places.

4 Theory

Labour market inequalities have been frequently explained by applying three major theoretical approaches (for an overview see Heyne, 2017 and Steiber and Haas, 2012). Firstly, the structural approach, which predominantly aims at explaining increased female labour market participation over time as a result of economic development, i.e. technological and occupational changes or educational expansion. However this approach has so far failed to fully explain persistent gender differences in employment across equally developed countries. Secondly, institutional approaches, explaining employment inequalities by focusing on institutional frameworks, particularly work-family policies or labour market characteristic, and thus, seeking to complement structural approaches. Thirdly, cultural approaches, which covers a wide framework of different theoretical explanations that all aim at explaining gendered labour market inequalities, by accounting for gender ideologies on the individual-level, as well as the impact of gender ideologies within the different levels in society, such as discourses and norm-settings effects or work-family policies (Pfau-Effinger, 1998; see Davis and Greenstein, 2009 for an overview).

Although the three approaches vary according to their focus on different explanatory factors, they also share some similarities (see Steiber and Haas, 2012) and, thus, taken together they provide a suitable theoretical framework to conceptualise the effect of public childcare provision on the formation of gender ideologies, as well as maternal employment behaviour. As both the structural and institutional approach rely on the assumption of the economic models of labour supply (Becker, 1991; Blau, Ferber and Winkler, 1998), this section briefly introduces the rational-choice based framework. This is followed by a brief summary of the cultural perspective on the formation and impact of gender ideologies. Within the three empirical studies in this thesis, both approaches are only very briefly discussed in order to derive individual hypotheses with respect to the research question of each study. Thus, this section aims at presenting the main

arguments of the economic perspective, including the neoclassical model of labour supply and the signaling model, as well as the cultural approach in more detail in order to place the following arguments and analyses into the overall theoretical context.

4.1 Economic Perspectives on the Effects of Childcare Provision

This subsection presents economic perspectives that have been frequently applied to explain gender differences in paid and domestic work. Both the neoclassical economic model of labour supply, as well as the signaling model, are presented with regard to specific theoretical assumptions that help to understand the theoretical association between childcare provision and maternal employment.

Maternal Employment within the Neoclassical Model of Labour Supply

In economic theory, the division of paid and domestic work and, thus, mothers' employment decision is regarded as a rational cost-benefit decision that aims at maximising individual or household utility, by optimising the allocation of time to both family or care activities and to employment (Blau, Ferber and Winkler, 1998; Becker, 1991).²¹ According to neoclassical economic theory, the allocation within households is most effective when family members specialise in market or nonmarket activities. To optimise the allocation of time to nonmarket and market activities, the value of time in the market, i.e. the potential income, is compared to the value accorded non-market activities, i.e. family time. Hence, the decision to work is reliant on the income from work being perceived as greater than the value placed on family time. According to the theory, the partner with the comparative advantage of higher income from paid work specialises in their market activity, whereas the – usually female – partner with lower market value focuses predominantly on family time to increase overall household utility.

Additionally, the neoclassical framework has aimed at including parts of the so called cultural explanation into the cost-benefit analysis by integrating not only individual constraints but also preferences (Blau, Ferber and Winkler, 1998: 86-97). In sum, the decision to work is based on a comparison of the potential market time, i.e. income from paid employment minus childcare costs, and the value placed on family time. This decision is subject to certain restrictions

²¹ While the neoclassical approach focuses on individual utility derived from market goods and leisure in general (Blau, Ferber and Winkler, 1998), the New Home Economics, founded by Becker (1965) and Mincer (1962), centres on decisions that are made by households rather than by individuals. The focus within this thesis is on the individual choice rather than on the family choice. Other theoretical models consider the decision as a family decision and include partner income and therefore family income in the budget constraint and assume that individual preferences take those of other family members into account (Blau et al., 1998: 86-87)

due to a limited amount of possible constellations of market and non-market time allocation, as well as combination of constraints and preferences for certain combinations.²²

With respect to the employment of mothers with young children, preferences on employment or family time are usually linked to preferences regarding parental or formal childcare and mothers' overall employment orientations. Hence, the preferences are assumed to be influenced by gender ideologies and career orientation, and thus, within the formal model, these preferences are presumed to reflect the difficulty in substituting market time for non-market time. With respect to mothers with young children, it is very likely that within the first year after birth, mothers value their family time more than their labour market value because of stronger preferences for time spent with their child. In the case of Germany in particular, differences in gender ideologies might explain persistent employment disparities between East and West Germany.

Considering restrictions, some factors such as own income from employment, affect the decision to work directly, while others have only an indirect impact, for example the value accorded to family-time. The value of family-time is thereby positively affected by income from sources other than own market time, such as a partner's income and governmental transfers, i.e. parental leave benefits. Thus, an increase in the value of family time and, hence, an indirect reduction of opportunity costs of staying out of the labour market, decreases the probability of maternal employment participation (id., 94) (*income effect*). In contrast, the value of market time might be reduced by childcare costs, which in formal models is usually considered as an additional tax of labour market income (Blau, Ferber and Winkler, 1998: 103; Esping-Andersen, 2009). Hence, childcare costs decrease individual income, thus increasing the opportunity costs of employment. In contrast, a reduction in childcare costs is associated with higher income, and thus, higher opportunity costs for time spent outside the labour market (*substitution or opportunity cost effect*) (Blau, Ferber and Winkler, 1998: 97). Hence, mothers are assumed to work whenever the substitution effect dominates the income effect and vice versa. But as an increase of individual income also implies a higher household income, both effects will occur when the value of market time is changed. Hence, the net effect of lower childcare costs is theoretically indeterminate (id.: 100-101).

But how does an increase in childcare availability influence the employment decision according to economic theory? In contexts where childcare is predominantly provided by private providers,

²² See Blau et al. (1998) for a formal analysis using a micro-economic model of the decision to provide a labour supply, which aims at illustrating individual preferences with indifference curves and household resources or constraints with a budget constraint. To reduce complexity, most models assume a division of time spent either on family work or market work, and thus market income, which is entirely spent on market goods only. Hence, saving does not occur.

an increase in public or publicly subsidised childcare is associated with lower childcare costs, and thus, an increase in maternal employment.²³ Parents are considered to be price sensitive, thus, they are assumed to substitute more expensive childcare providers with cheaper services when all other factors are equal. Consequently, lower childcare costs would lead to an overall increase of mothers' wage rates and family income, implying an income as well as a substitution effect (Uunk, Kalmijn and Muffels, 2005; Haan and Wrohlich, 2011). Again, the net effect cannot be analysed theoretically (Ermisch, 1989), however, for most mothers the substitution effect is more likely to dominate the income effect, as first suggested by Mincer (Blau, Ferber and Winkler, 1998: 102) and empirically confirmed in the context of various high- and middle-income countries (e.g., England, Gornick and Shafer, 2012). This implies that the effect of mothers' potentially higher income dominates negative effects of higher household income.

Moreover, in view of the important restrictions and preferences for the decision to work, economic labour supply theory presumes that particularly mothers with high opportunity costs of non-employment will increase their labour supply most when public childcare becomes widely available (Becker, 2009b; Mincer and Polachek, 1974). Consequently, the effect of increased childcare provision on maternal employment is likely to vary according to mothers' socioeconomic backgrounds. Hence, mothers with higher earnings and, hence, higher levels of educational attainment, might be most likely to work, as this group is confronted with the highest opportunity costs. These result from larger income losses during a family related employment interruption, as well as stronger human capital deprivation, which is considered to be particularly important for individuals with higher educational attainment. Consequently, given the important connection between individual educational attainment, higher income (e.g., England *et al.*, 2016; England, Gornick and Shafer, 2012), less traditional gender ideologies (e.g., Cunningham, 2008; Cunningham, 2005) and increasingly homogenous relationships with respect to partners' educations, and thus household income (see Blossfeld, 2009 for an overview), the relationship is likely to vary not only according to mothers' educational attainment levels, but also according to gender ideologies and income on the individual- and household-level.

Maternal Employment within the Signaling Model

As an alternative to the textbook model of the neoclassical labour supply, the Signaling theory by Spence (1973) has also been applied to explain female labour market behaviour (e.g.,

²³ In contexts where market based childcare is not available, such as in West Germany prior to the start of the expansion of childcare provision, childcare costs might include families' expenditures for informal private carers, as well as social costs due to the reliance on relatives, friends or neighbours for care provision.

Schmelzer, Kurz and Schulze, 2015), as well as differences in maternal employment across welfare regimes (e.g., Halldén, Levanon and Kricheli-Katz, 2016). Rather than only focusing on the individual resource endowment of employees on the supply side, this theory focuses on signals, such as educational attainments, and therefore also takes labour demand into account. Although the theory primarily focuses on how employers use observable characteristics such as educational attainment to assess individual productivity and work-commitment, it can also be assumed that family related employment interruptions are considered as signals for mothers' work-commitment. Hence, employers might regard shorter child-related career interruptions as a signal for higher work-commitment (Schmelzer, Kurz and Schulze, 2015). Consequently, the employer's perspective might be anticipated by mothers, and therefore taken into account when deciding on whether to return to employment.

As employers cannot observe the marginal contribution of each potential worker directly before signing a contract, they assign a marginal product which depends on the combination of indices and signals (Spence, 1973). According to Spence (1973: 357), "the employer will have conditional probability assessments over productive capacity given various combinations of signals and indices". Hence employer observe a range of characteristics such as sex, age, education, previous contracts or periods of unemployment which they relate to previous experience with somehow similar employees, and thus assign an average marginal product, i.e. wage, based on the observed characteristics. However, in order to increase the assigned marginal product, and thus individual income, some signals can be manipulated by the job applicants (id.: 357), for example individual investments in education, as well as – with respect to maternal employment participation – the shortening of a family related employment interruptions.

Based on the expectation that employers consider marginal or part-time employment after childbirth as a signal of low productivity and reduced work commitment, mothers may decide to return to employment shortly after birth in order to signal their commitment to the employer, effectively increasing their labour supply. As the model presumes that the lower the signalling costs, the higher the assigned individual productivity, thus, a signal will only efficiently distinguish applicants from each other when the signalling costs are negatively correlated with productive capability (id.: 358). For mothers the costs of shorter family related employment interruptions might take the form of monetary costs for childcare, but also in indirect costs, such as time, as well as psychological costs due to the use of early non-parental childcare. Hence, with respect to mothers, the lower the signalling costs for shorter family-related employment interruption, the higher the estimated productivity by a prospective employer.

Increased, and relatively cheap, public childcare provision, is assumed to decrease monetary signalling costs making indirect costs such as foregone family time, and psychological costs

more important for the timing of a return to employment. Particularly career-oriented mothers with less traditional gender ideologies towards maternal employment and non-parental care might be more likely to experience comparatively low psychological costs, and thus, to send a positive signal to their employers by returning to employment quite soon after birth. Hence, in line with human capital theory and the neoclassical theory of labour supply, the signaling approach, reinforces the argument that particularly mothers with a higher level of educational attainment, and thus, higher incomes and less traditional gender ideologies, are most likely to use a shorter employment interruption as a signal to publicise their higher work related motivation levels and the importance they attribute to their careers in general.

In sum, both economic approaches presume the increase in childcare provision to be positively associated with maternal employment. By applying the neoclassical model as well as the signaling model, it has been shown that an increase in public childcare services is likely to increase maternal employment. This might be either because of lower opportunity costs of employment due to the increased availability of childcare at a comparatively low price, or because greater levels of childcare enable mothers to actually send their employer a signal regarding their career orientation by shortening their employment interruptions. In addition, both economic approaches indicate that the relationship between increased childcare provision and maternal employment is likely to vary according to mothers' socioeconomic backgrounds, with a stronger association for mothers with higher levels of educational attainment and, thus, higher earnings.

4.2 A Sociological Perspective: Gender Culture and Gender Ideologies

Although economic perspectives have contributed greatly to the understanding of maternal employment participation, to date, these approaches have not yet been able to fully explain the persistent gender differences in paid and domestic work. More precisely, the economic perspective fails to explain why it is still women that perform most of the household and care work, particularly after the birth of a child (e.g., Grunow, Schulz and Blossfeld, 2012; Kühhirt, 2012; Schober and Zoch, 2015; West and Zimmerman, 1987). Some versions and extensions of the economic theory of labour supply have aimed at integrating preferences and norms into their cost-benefit calculation such as Hakim's Preference Theory (Hakim, 2000) or bargaining approaches (e.g., Lundberg and Pollak, 1996). However, these approaches have also only insufficiently explained persistent gender inequalities in paid and domestic work (Nitsche and Grunow, 2016;

Schober and Zoch, 2015).²⁴ Hence, considering the increase in public childcare in Germany, the rational choice based cost-benefit explanation might also not be sufficient to explain potential socioeconomic differences in maternal employment behaviour. Particularly with respect to the former lack of public and market-based childcare provided in West Germany, the currently comparatively low and income-dependent childcare fees, as well as persistent East-West differences in gender ideologies, the cost-benefit based explanation struggles to explain persistent differences in maternal employment and childcare take-up in Germany. Hence, a cultural perspective seems beneficial to theoretically explain the relationship between increased childcare and the changes in gender ideologies as well as maternal employment.

Given the need for a more sociological perspective, this subsection, firstly, presents the cultural perspective on the formation and changes in gender ideologies and gender culture, as well as their interplay with the institutional framework of work-family policies. In the following it briefly describes how previous theoretical perspectives have related institutional change to changes in gender ideologies, and hence, to maternal labour supply.

Sociological perspectives that seek to explain women's labour supply by focusing on cultural approaches can be divided into an individual-level perspective and a perspective focusing more on the societal level (Steiber and Haas, 2009; Uunk, 2015). Firstly, these take the view that employment decisions are guided by women's gender ideologies, assuming less traditional ideologies to be positively linked to maternal employment. Secondly, it is argued that the gender ideologies that prevail in the mother's social context, including for example the gender ideologies of her partner, her family or her colleagues at work, are likely to influence her chosen work-care arrangement. In this case, the attitudes and values of others operate in the context of social norms, or so called gender culture. In sum, the cultural approach, hence, aims at explaining disparities in maternal employment with differences in the composition of women with varying individual-level gender ideologies as well as differences in the contextual effects of gender ideologies on the societal level, i.e. gender culture. Thereby, less traditional gender ideologies or gender culture are assumed to be positively associated with a less traditional division in paid and domestic work among couples.

To explain differences in maternal employment across countries, cultural approaches draw on the importance of the institutional framework, which is assumed to both reflect and to promote distinct gender ideologies via specific work-family policies, the labour market and gender

²⁴ The term of norms and preferences have been widely applied in the economic and psychological literature, however, within the sociological literature on gender and family, particular the term preferences has remained less common. Instead, the terms gender ideologies and gender culture are used to refer to values and preferences regarding work-care arrangements on the individual or societal level (see subsection 3.1).

culture. Taken together, these create a complex interplay and reference point for individuals' work and care decisions (Grunow and Veltkamp, 2016). Hence, these institutional settings are both reproduced and altered by individuals, i.e., work-family policy institutions are shaped by gender ideologies, and people adjust their ideologies according to the policy framework. However, it is very likely that both approaches apply to some extent. The theoretical approach of the *care arrangement* (Pfau-Effinger, 2005) has aimed at conceptualizing how policy institutions reflect and interact with the existing gender culture, which results from peoples' gender ideologies. Out of the complex mixture of gender ideologies and work-care policies, a variety of arrangements can be distinguished that describe the division of paid and unpaid work, the work-care, or so-called care arrangement.²⁵ However, like most regime typologies, this approach focuses on the classification of existing work-care arrangements rather than at explaining the change in welfare regimes (Bonoli, 1997) and thus, short-term changes in individual-level gender ideologies due to family policy reforms.

Given the importance of the institutional framework, however, to date, there is no clear theoretical underpinning explaining the formation and change of ideologies across individuals' life courses due to policy reforms. With respect to the formation of gender ideologies on the individual-level, a wide range of research has assumed parental socialisation to be the main factor in shaping attitudes towards the articulation of work and family life (e.g., Cunningham, 2001). These approaches have considered gender ideologies to be largely stable over an individual's life course. However, as outlined in the section on previous research on gender ideologies (see section 3.1), empirical findings based on longitudinal studies contradict these assumptions by revealing a considerable impact of major life course events on gender ideologies as well as short-term changes in gender ideologies related to work-family policy change. Nevertheless, these approaches have no clear theoretical framework.

To explain how institutional changes, in this case a major increase in childcare services, might facilitate a change in gender ideologies in the short-term, this thesis draws on earlier sociological construction perspectives to develop a conceptual framework to explain short-term changes in gender ideologies within an individual's life course. Sociological or social-psychologist approaches, including various *identity constructivist approaches* and *role theory* (for an overview of similarities and differences see Stets and Burke, 2000), have highlighted the importance of

²⁵ These consist of: the *male breadwinner family*, the *male breadwinner-female part-time carer* model (also known as the modernised male breadwinning arrangement or dual-earner, family-carer arrangement), the *dual breadwinner-external carer* model (also known as dual-earner, state-carer arrangement) and the *dual breadwinner-dual carer model* (Pfau-Effinger, 2005; Sigle-Rushton and Kenney, 2004).

the social context and opportunity structure for identity construction. According to these approaches, individual identity results from the *self-categorisation* or *identification* in contrast to other social categories or groups (Stets and Burke, 2000: 224). Thus, the feeling of identifying with and belonging to a specific social group or category is based on the perception of shared characteristics between individuals, which in turn enable groups to define themselves and distinguish themselves from other groups. This identity formation might, however, entail a change in an individual's previously held ideologies and values.

According to constructivist approaches, life course transitions, such as transitions in the educational system, and the labour market, as well as family transitions like marriage or parenthood, are likely to be associated with changes in self-categorisation and, hence, with a (re-) construction of identity and changes in ideologies held. For example, a transition to parenthood might shape distinct identities with respect to the work-care arrangements (Himmelweit and Sigala, 2004). Based on the individually practised work-care arrangements, women may self-categorise or identify with the group of female homemaker rather than the group of working mothers. Hence, they most likely construct a new identity and, therefore, might align previous beliefs and values about the roles and separate spheres for men and women (Festinger, 1957). Thus, for mothers who interrupt their employment after childbirth, the transition to parenthood might be linked to the adoption of more traditional gender ideologies (Baxter *et al.*, 2015; Himmelweit and Sigala, 2004; Schober and Scott, 2012). In sum this social-psychologist conceptualisation might help to explain changes in gender ideologies within the life course. Nevertheless, this approach does not explicitly take into the account the relationship between changes in the institutional context and changes in gender ideologies.

Unfortunately, whether and how changes in the institutional context might impact on the short-term formation and change of gender ideology within the life course has not yet been theoretically conceptualised. So far previous research, particularly in the political science and political sociology, has emphasised approaches such as welfare regime socialisation and the institutional learning process (Rohrschneider, 1996) to explain differences in political ideologies across welfare states, in particular with respect to East and West Germany. Hence, it has been argued that "In its most basic formulation, the institutional learning process assumes that an individual absorbs those values and norms that a political system installs in citizens" (Rohrschneider, 1996: 424). Furthermore, within the political sciences the concept of *policy feedback effects* has been widely applied when investigating whether citizens' ideologies and preferences not only affect future public policies but whether these policy changes also result in feedback effects on citizens' welfare-state-related attitudes (Kumlin and Stadelmann-Steffen, 2014). Accordingly, indirect and direct effects lead to changes in ideologies and behaviour for enabling

policies in particular, which lift previous constraints to behaviour and enables choices, previously not available (Himmelweit and Sigala, 2004). Thus, Himmelweit and Sigala (2004) point to the importance of policies such as childcare provision that expand the choices for mothers and, hence, create social policy feedback effects with respect to gender ideologies. However, in sum, so far none of these approaches has clearly conceptualised the mechanism behind short-term ideology formation with respect to policy changes.

To summarise, both economic and sociological theories presume increased levels of childcare coverage for under-threes to be associated with higher levels of maternal employment. Additionally, both theoretical frameworks suggest that the association between childcare provision and maternal employment is very likely to vary with mothers' opportunity costs and therefore socioeconomic backgrounds. Hence, it is presumed that mothers with higher opportunity costs of non-employment, such as mothers with higher levels of educational attainment or mothers with an only child are more likely to work when levels of childcare coverage for under-threes are high, and particularly if available as full-time care positions.

However, to date no theoretical approach has conceptualised how institutional change, such as work-policy reforms, may induce a change in gender ideologies, which have been shown to strongly correlate with maternal employment. Nevertheless, existing literature has drawn on the importance of constructivist identity approaches, regime socialisation and policy feedback effects that point to the importance of ideology formation due to life course events and policy change. Hence, this thesis aims at developing a theoretical framework by integrating the concept of policy feedback processes with social psychological approaches in order to analyse whether the paradigm change in German family policies, in particular the expansion in childcare for under-threes, is associated with a change in gender ideologies.

5 Contribution

By focusing on a period that saw a major increase in childcare provision in Germany, this thesis aims at investigating whether the provision of childcare services for under-threes is positively associated with maternal employment and a change towards less traditional gender ideology among parents with young children. While the few empirical studies on maternal employment only provide mixed evidence, to date, no study has addressed the questions of whether this tremendous increase in the supply of public childcare for under-threes is positively linked to short-term changes in gender culture. Hence, this thesis investigates, firstly, whether the increase in public childcare provision has facilitated short-term change in individual-level gender ideologies

among parents with young children (Chapter 2) (for an overview of the studies see Table 1.1). Secondly, this study analyses whether higher levels of childcare provision were associated with shorter employment interruptions amongst mothers of under-threes (Chapter 3). Thirdly, the thesis investigates whether the association between childcare provision and maternal employment was more pronounced among certain subgroups of mothers, considering mothers' educational attainment, maternal employment in part- or full-time positions, and whether the relationship is stronger for full-time childcare provision rather than both full- and part-time places (Chapter 4).

Table 1.1 Overview of the three empirical studies and contributing authors

Chapter	Journal	Contribution of	
		Author	Co-authors
2	Journal of Marriage and Family	60%	Pia. S. Schober (40%)
3	European Sociological Review	50%	Irina Hondralis (50%)
4	[Review Process]	100%	-

Germany provides an interesting case study to analyse the consequences of a major expansion in public childcare services for several reasons. Due to the former division, East and West Germany offer the chance to investigate increased childcare provision in two contexts that differ remarkably in their pre-reform levels of formal childcare, maternal employment, and thus, traditional gender ideologies, as well as with respect to their current economy and labour market contexts (see subsection 2.1). Hence, the East-West disparities provide the opportunity to study the consequences of an increase in childcare services in two differing contexts by not only taking into account the time and regional variation in the childcare expansion, but also with respect to variation in full-time childcare coverage.

Furthermore, the current family policy framework of supported familism in Germany has become somewhat of an exception with regard to other welfare or family policy regimes, which further increases the interest of focussing on Germany (see subsection 2.2.). To date, the combination of the de-familialising income related parental leave benefit and increased public childcare services increasingly support the dual-earner, dual-carer model (Hook, 2015; Leitner, 2003; Saraceno and Keck, 2010). However, simultaneously older familialising policies such as joint taxation and family health insurance continue to reinforce the traditional male breadwinner model. Hence, previous international studies that focus on the expansion of public childcare might not be applicable to the German context of optional familism. Particularly, studies of

the U.S. have analysed increased childcare coverage primarily in a context where childcare services are dominated by for-profit providers, while European studies have not yet focused on childcare policy analysis within the rather exceptional framework of optional familism.

To investigate whether the increase in childcare provision is positively associated with maternal employment or a change towards less traditional gender ideologies all three studies in this thesis link rich individual- and household-level data from panel surveys with annual administrative childcare records at the county-level (see Figure 1).²⁶ With annual childcare data at hand, applying a micro-macro approach provides the opportunity to disentangle compositional differences at the individual-level and childcare policy variations at the macro level. This can thus explain the variation in maternal employment participation and changes of gender ideologies more precisely than most previous studies. The empirical analyses focus on time periods between 2006 and 2015 and, hence, exploit considerable variation in childcare provision. These

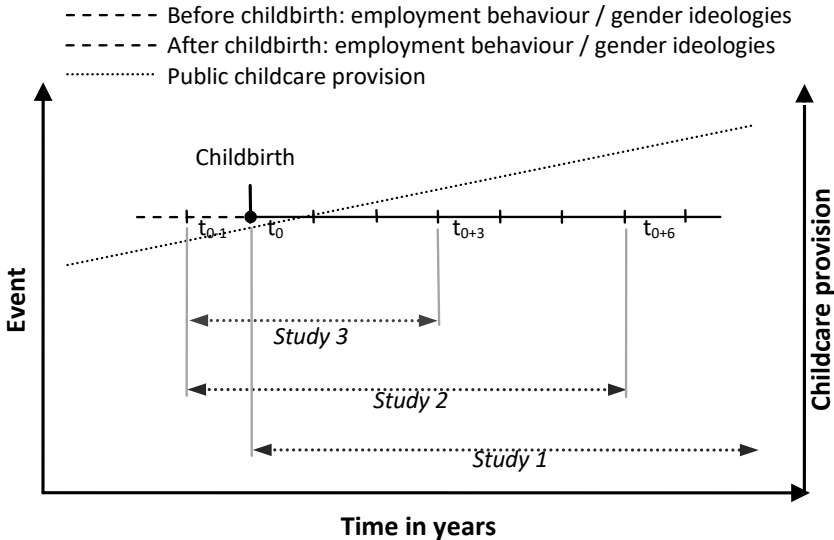


Figure 1 Analysing gender ideologies and maternal employment during the course of the childcare expansion

include: annual variation since the start of the expansion in 2005; regional variation between East and West Germany; and county-level variation in childcare provision across counties in East and West Germany. Similarly to previous comparative studies focusing on a small number of countries, separate models for East and West Germany are applied in order to investigate how the associations between childcare provision and maternal employment or changes of gender ideologies varies in two different contexts.

²⁶ The data are publicly available from the Federal Statistical Office or from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR, 2017).

Furthermore, the thesis aims at contributing to the broad literature on childcare provision by additionally investigating whether the link between public childcare provision and maternal labour market behaviour, as well as short-term changes in gender ideology is more pronounced among certain subgroups. Hence, the analyses also investigate the associations with respect to different levels of educational attainment. Moreover, the two studies focusing on maternal employment in particular, analyse whether the link between employment and childcare provision is stronger after a first or second birth, when the opportunity costs of employment are likely to increase. Additionally, this study assesses whether the relationship between childcare and employment is stronger for the availability of full-time childcare provision, or provision that includes both full- and part-time places.

In sum, the three studies aim at contributing to the understanding of maternal employment and short-term changes in gender ideologies in the context of the recent expansion of childcare services. For each of the three studies, the following three subsections briefly summarise the respective research question, the applied data and empirical design, and outline the major findings and overall contribution to the previous literature. Each of the three studies is then presented in the Chapters 2, 3 and 4. Chapter 5 summarises the main contribution of the three empirical studies to the literature and addresses limitations and open questions that might provide promising terrain for future research.

5.1 Study 1: Changing Gender Ideologies towards Maternal Employment

The first study investigates whether the childcare expansion in Germany has been associated with a shift towards less traditional gender ideologies among parents with young children. Co-authored by Pia S. Schober, the study extends previous literature by developing and testing a theoretical framework of the short-term impact of family policy institutions on changes in gender ideology within the life course. Accordingly, the expansion of childcare is assumed to increase the acceptance of maternal employment through role exposure or normative policy effects, and hence, to foster a change towards less traditional gender ideologies.

The analysis links the German Family Panel pairfam (2008 to 2015) (Brüderl *et al.*, 2016) with administrative childcare data at the county-level, and applies separate fixed effects panel models for mothers and fathers in East and West Germany. The findings show that the childcare expansion has only been associated with moderate shifts towards less traditional gender ideologies among mothers in West Germany, and mostly among mothers without a college degree. Surprisingly, in East Germany, the results provide tentative evidence of more traditional gender ideologies among mothers without a college degree. In contrast, no significant associations were

found for fathers in East and West Germany. Despite a strong association of maternal employment transitions with gender ideologies among mothers in West Germany, the results did not find employment transitions to mediate or moderate the relationship. This may point to indirect mechanisms linked to changes in information about childcare provided by the media and social networks. Furthermore, the non-linear relationship with the childcare measure in combination with the finding of a significant difference between West and East Germany may suggest that pronounced changes in mothers' gender ideologies are more likely in previously relatively traditional contexts.

Overall, the results of this study lend support to the literature on the relevance of life course effects on gender ideologies. In line with the few previous studies (Ellingsæter, Kitterød and Lyngstad, 2017; Gangl and Ziefle, 2015; Unterhofer and Wrohlich, 2017) the results provide further evidence that family policy reforms, such as an expansion of childcare services, may facilitate change in gender ideologies not only across cohorts but also within the life course. However, the findings emphasise that the impact of this institutional change seems to be moderate and is concentrated in counties with low levels of previous childcare provision, and among respondents with greater policy proximity due to a higher likelihood of role exposure and social interaction with other individuals from the policy target group.

5.2 Study 2: Mothers' Return-to-Work Behaviour

The second study investigates whether higher levels of public childcare provision for under-threes are associated with shorter employment interruptions amongst mothers in East and West Germany.²⁷ The paper is co-authored by Irina Hondralis. Both economic and sociological theories presume greater levels of public childcare to be positively associated with shorter employment interruptions after childbirth, particularly in the second year after childbirth when leave entitlements run out. The study extends the literature on women's return-to-work behaviour by providing evidence on the medium-term association between increased levels of childcare provision and the duration of mothers' employment interruptions, and by assessing the length of interruption durations according to first and second birth.

The analysis links longitudinal data from the German Socio-Economic Panel (2006 to 2014) (Wagner, Frick and Schupp, 2007) with annual administrative childcare data at the county-level and estimates separate event history models for East and West Germany. The results indicate that higher levels of childcare provision were positively associated with shorter employment interruptions, particularly among West German mothers. Beyond this, the association was more

²⁷ The use of the more complex phrase "low-cost, state-subsidised childcare availability" refers to public childcare provision and is due to the specific preferences of one of the journal's reviewer.

pronounced for interruptions following a second birth and in the second year after childbirth, when paid leave entitlements expire. Finally, the results point to a stronger link between public childcare and mothers' returns to substantial employment compared to returns to marginal employment.

Overall, the findings are in line with previous results on the positive relationship between public childcare provision and maternal employment (Morrissey, 2017 for an overview). The positive but insignificant findings for East Germany may point to previous studies that find the link between increased childcare provision and maternal employment to be particularly pronounced in contexts with previously exceptionally low childcare provision (e.g., Brilli, Del Boca and Pronzato, 2016; Havnes and Mogstad, 2011; Lundin, Mörk and Öckert, 2008). Furthermore, the findings suggest that mother return behaviour may not only depend on whether parental leave benefits expire, but also on whether family planning is likely to be completed. This finding is supported by previous research results on a more pronounced and persistent two-child norm (Diabaté and Ruckdeschel, 2017), and a tight spacing of two to four years between a first and second child (Kreyenfeld, 2008) among West German mothers, particularly for mothers with high educational attainment (Brehm and Buchholz, 2014; Kreyenfeld, 2002). More generally, the findings emphasise that higher levels of public childcare provision are associated with shorter employment interruptions, particularly in contexts with previously low childcare coverage and comparatively long interruptions durations after childbirth.

5.3 Study 3: Mothers' Labour Supply – Do all Mothers Profit from Higher Coverage?

The third study investigates whether higher levels of public childcare provision for under-threes have been positively associated with employment participation and more weekly working hours among mothers with different socioeconomic backgrounds. Both standard economic and sociological theories presume that the relationship between public childcare provision and employment varies with mothers' socioeconomic backgrounds. Thus, the study extends previous research that often failed to distinguish between the provision of childcare in general, and full-time childcare in particular, as well as differentiating between mothers with different educational backgrounds and between first and second births.

Similarly to the second study, the analysis links annual administrative childcare records at the county-level with individual-level data of the Socio-Economic Panel Study for 2006-2015 (Wagner, Frick and Schupp, 2007). The analyses seek to compare the employment behaviour of mothers in counties with higher or lower levels of childcare, and thus, apply a control-group design together with the matching technique *entropy balancing* (Hainmueller, 2012).

The results show that higher levels of childcare provision have been positively associated with maternal employment participation and mothers' weekly working hours, particularly in West Germany. For West German mothers, the positive relationship seemed to be driven by part-time employment and second births, particularly among those with medium and high levels of education, while the link with full-time employment seemed to be limited to mothers with higher levels of education. For the much smaller sample of East German mothers, the results were mostly insignificant, however, the positive estimates, particularly among mothers with medium education levels, also provided some evidence for a positive association between childcare provision and full-time employment for East Germany.

In sum, the findings again lend support to the literature on the relevance of childcare provision for maternal employment, particularly in contexts with previously exceptionally low childcare (Morrissey, 2017 for an overview). The educational inequalities in the results for West Germany are in line with a more recent study that found growing educational disparities in maternal employment and childcare take-up for the period of 2007 to 2013, with a more pronounced increase in employment among mothers with at least a vocational degree compared to earlier periods (Stahl and Schober, 2017). The particularly pronounced results after a second birth correspond to the second study that finds significantly shorter interruption durations after second births. From a broader perspective, the findings emphasise the importance of higher levels of childcare provision, particularly with respect to the pronounced association between full-time childcare provision and full-time employment in both East and West Germany. Here, however, results point to important educational disparities with stronger association mostly among mothers with higher educational attainment.

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Chapter 2 Public Childcare Expansion and Changing Gender Ideologies of Parents in Germany *

Abstract

This study investigates whether the expansion of public childcare for under-threes in Germany has been associated with individual-level change in gender ideologies. The authors develop and test a theoretical framework of short-term impact of family policy institutions on ideology change over the life course. The analysis links the German Family Panel pairfam (2008 to 2015) with administrative records on childcare provision at county-level and applies fixed effects panel models. The findings show that the childcare expansion has been associated with moderate changes towards less traditional gender ideologies only among mothers in West Germany and mostly so among mothers without a college degree. In East Germany, the authors found evidence of more traditional gender ideologies among mothers without a college degree as the childcare reform unfolded. The results provide evidence that policy reforms may alter gender ideologies also in the short-term over the life course.

Keywords: child care, employment, family policy, gender roles, longitudinal research, quantitative methodology

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1 Introduction

During the past decades, many Western countries have invested increasingly in family policies to facilitate the combination of employment and childcare and to reduce persistent gender differences (International Network of Leave Policies & Research, 2016). A large body of international economic and sociological literature has focused on how the length of leave entitlements, compensation rates, and fathers' quota or the availability and costs of childcare services impact the gender division of domestic work and paid employment (e.g., Geyer, Haan, & Wrohlich, 2015; Hook, 2006; Pettit & Hook, 2005). Comparative studies have highlighted the importance of family policy institutions not only for shaping opportunity structures but also for influencing gender culture within society (e.g., Böckmann, Misra, & Budig, 2015; Grunow & Evertsson, 2016; Sjöberg, 2004). However, few studies have investigated whether and through which channels family policy reforms may alter gender ideologies in the short-term. The recent expansion of childcare provision for those aged younger than three years in Germany provides a unique opportunity to investigate the short-term impact of family policy change on individual-level gender ideologies.

Investigating gender ideologies is important to understand persistent gender inequalities. Gender ideologies have been found to correlate with related behavior, such as maternal labor supply, career trajectories and the gender division of domestic labor (see Davis & Greenstein, 2009 and Steiber & Haas, 2012 for an overview). A number of cross-sectional comparisons of maternal employment (e.g., Böckmann et al., 2015) and gender ideologies (e.g., Sjöberg, 2004) across countries emphasize the institutional context, in particular the availability of affordable non-parental childcare (Ciccia & Bleijenbergh, 2014; Steiber & Haas, 2012). In addition, recent longitudinal studies suggest a significant attitude change due to life course events, such as marriage, childbirth, child's sex or death of a relative (e.g., Baxter, Buchler, Perales, & Western, 2015; Brooks & Bolzendahl, 2004; Schober & Scott, 2012). These studies provide evidence that the formation of gender ideologies is not completed in early adolescence but remains subject to the influence of later life course events. However, with respect to family policies, little evidence exists as to whether institutional reforms can alter ideologies only in the long-term via cohort replacement or also in the short-term (Ellingsæter, Kitterød, & Lyngstad, 2017; Gangl & Ziefle, 2015; Unterhofer & Wrohlich, 2017).

We contribute to the literature on cultural change over the life course by investigating whether the recent expansion of public childcare places in Germany has been associated with a change in gender ideologies. By combining longitudinal individual-level information on parents' ideologies with annual administrative records on childcare provision at the county-level, we ex-

exploit regional and temporal variation in the expansion of formal childcare provision and investigate whether greater childcare availability increases the acceptance of maternal employment due to role exposure or normative policy effects. By investigating the relationship of the expansion of childcare services with ideologies separately for East and West German mothers and fathers, respectively, we are able to examine whether different pre-reform cultures regarding maternal employment and formal childcare use may moderate any short-term policy effects.

2 Institutional and Cultural Context in East and West Germany

Persistent East-West differences in the acceptance of maternal employment and formal childcare have long been explained by different family policies before the German reunification. Before 1990, the institutional setting in West Germany was characterized by joint taxation for couples, family health insurance, long but low-paid parental leave entitlements, and a lack of public childcare services. This has frequently been classified as supported familialism (Hook, 2015) and is considered to suppress employment of second earners and reinforce gender inequality. New mothers tended to interrupt their employment for several years and often returned to the labor market only part-time. By contrast, in the German Democratic Republic shorter parental leave and extensive provision of formal care for very young children encouraged a fast and full-time return to the labor market of mothers (Rosenfeld, Trappe, & Gornick, 2004). Since reunification, employment trends among mothers with young children have converged somewhat and part-time employment has become the most prevalent arrangement to combine employment and family care in both regions (Konietzka & Kreyenfeld, 2010). Yet the historical differences are still reflected in longer employment interruption durations, lower maternal employment participation and more traditional gender ideologies of parents towards maternal employment and using formal childcare for young children in West Germany compared to East Germany.

Since the mid-2000s, reforms of parental leave and childcare policies in Germany indicate a paradigm shift from the previous model of supported familialism (Hook, 2015). They aimed at improving the compatibility of employment and family care, speeding up maternal labour market return, and increasing paternal childcare involvement. Before a major reform in 2007, parents on parental leave were eligible to receive a childrearing benefit of about 300 Euros per month for the first six months and depending on household income, parents could extend this until the child's second birthday. In 2007, the German government introduced an income-related parental leave of twelve months and an individual 'use-it-or-lose-it' entitlement of two months of leave for each parent. As before, each parent has been entitled to three years of job-

protected leave in total. However, the more generous and income-related compensation for a shorter period provided incentives for faster maternal labor market return.

Furthermore, the recent expansion of public childcare provision for children under three years has increased overall childcare attendance rates tremendously in East and West Germany, albeit starting from a different level. The expansion started with the Day-care Expansion Act (*Tagesbetreuungsausbaugesetz*) in 2005, which provided extra funding and granted prioritized access for children with parents in employment or education. In addition, the 2008 Child and Youth Welfare Act (*Kinderförderungsgesetz*) stipulated a legal right to a place in formal care for all children aged one year or older from August 2013. Between 2006 and 2014, the average attendance rate for children aged under three years subsequently increased from 8 to 27 percent in West Germany and from 40 to 52 percent in East Germany (Strunz, 2015). However, these average changes mask great regional variation in attendance rates ranging from 14 to 47 percent in West German counties and from 45 to 63 percent across counties in East Germany in 2014 (Strunz, 2015). These regional variations in the development of childcare provision over time are significantly related to the strength of catholic history, trends in maternal employment, and political priorities of specific parties (Andronescu & Carnes, 2015). In this study, we exploit these temporal and regional variations in the childcare expansion to identify short-term effects on parental attitude change over the life course.

3 Previous Studies

Several comparative studies of a small number of countries or cultural contexts have hinted at the importance of family policy institutions in shaping opportunity structures and cultural ideals regarding maternal employment and adequate care for young children (e.g., Banaszak, 2006; Bauernschuster & Rainer, 2012; Sjöberg, 2004). These approaches generally assume that beliefs and practices in terms of work-family articulation are formed during childhood in relation to the overall context of parental as well as welfare regime socialization and consider them largely stable over the life course. Cultural change therefore is assumed to be driven by cohort replacement (e.g., Baxter et al., 2015; Bolzendahl & Myers, 2004; Brooks & Bolzendahl, 2004; Sjöberg, 2004; Steiber & Haas, 2012).

A few recent comparative studies using (repeated) cross-sectional data consider more direct measures of institutional support for different work-care arrangements to better disentangle compositional differences at the individual level and cultural or policy variations at the macro level (Kangas & Rostgaard, 2007; Sjöberg, 2004). Based on a cross-sectional comparison of seven European countries, Kangas & Rostgaard (2007) found that a higher level of formal childcare

provision in terms of availability, affordability and quality correlated with greater probability of female employment. Sjöberg (2004) found that more generous family policy institutions which support the dual-earner family were associated with less traditional gender ideologies towards maternal employment at the individual level. These studies were unable to estimate any causal effects or disentangle attitude change due to cohort replacement from attitudinal change over the life course.

Although several studies have shown that ideologies are transmitted in childhood and remain relatively stable over time (Cunningham, 2001; Min, Silverstein, & Lendon, 2012; van Putten, Dykstra, & Schippers, 2008), there has been additional support for ideology change over the life course. Theories of individual change share the common assumption that altered contexts, lifetime events, or practices can lead to changes in gender ideologies (e.g., Brooks & Bolzendahl, 2004; Kraaykamp, 2012; Stets & Burke, 2000), such as the impressionable years hypothesis (Alwin & Krosnick, 1991), which assumes young adults to have the least stable preferences and to experience substantial ideology change. In line with this, Min et al. (2012) have shown a conditional lagged effect of parental socialization on their children's gender ideologies. When children reach a certain level of maturity and experience certain lifetime events, gender ideologies which they were previously exposed to might be activated. Thereby, young adults' ideologies are not determined solely by their parents but shaped by contextual and interactional dynamics, especially during major life course transitions such as marriage, parenthood, and labor force entry or exit (Alwin & Krosnick, 1991; Brooks & Bolzendahl, 2004; Cunningham, 2001).

A few authors, applying a repeated cross-sectional design, have attempted to disentangle cultural change due to cohort replacement and ideology change over the life course, by controlling for period effects or analyzing different periods (e.g., Bolzendahl & Myers, 2004; Davis & Greenstein, 2009; Kraaykamp, 2012). By decomposing inter-cohort and intra-cohort effects, Kraaykamp (2012) has shown considerably larger intra-cohort effects compared to cohort-change for the increase in gender-egalitarian views in the Netherlands. Some single country longitudinal studies of the UK, Australia, and Germany have also provided evidence of changes in gender ideologies after the transition to parenthood (Baxter et al., 2015; Berrington, Hu, Smith, & Sturgis, 2008; Schober & Scott, 2012). The extent of change appears to correlate with labor market transitions and childcare choices and the extent to which these are in line with prenatal gender ideologies or constrained by economic and institutional factors (Berrington et al., 2008; Schober & Scott, 2012). These longitudinal studies, however, were unable to consider direct measures of changes in institutional context, such as childcare services, over time. Grunow and Müller (2012) found that East German mothers who were born in the East but living several years in the West prior to childbirth returned to the labor market more slowly than their East German

counterparts did, but faster than other West German mothers did. The authors take this as a sign of moderately stable socialization but also cultural adaptation to a different institutional, particularly to the lack in childcare provision, and cultural setting in West Germany. However, by focusing only on the period between 1992 and 2002, the author did not capture relevant increases in childcare services, particular in West Germany.

To our knowledge, only a few recent studies have examined short-term influences of work-family policy institutions on gender ideologies. Based on a survey-experimental design, Pedulla & Thébaud (2015) showed that the majority of young adults preferred an egalitarian relationship structure. Particularly women were significantly more likely to choose a more gender-traditional arrangement when facing institutional constraints without supportive policies, such as gendered workplace cultures and policies, which constrain equal sharing of breadwinning, housework, and care giving. Applying a treatment and control design to cross-sectional data from Norway, Kotsadam & Finseraas (2011) found that the introduction of an individual parental leave entitlement was associated with a more gender equal division of housework and less frequent conflict over household labor 15 years after the reform but was not significantly related to changes in gender ideologies. By applying difference-in-difference estimators, Gangl & Ziefle (2015) revealed that several reforms increasing the generosity of parental leave entitlements in Germany during the 1990s and early 2000s were associated with role exposure and norm setting effects. They provide evidence that parental leave policies resulted in a decline in mothers' work commitment and labor force participation. Unterhofer & Wrohlich (2017) exploit a quasi-experimental setting of a parental leave reform in 2007 in Germany, which introduce income-related leave reimbursement and a fathers' quota while shortening the duration of paid leave. They found that the reform led to a change towards less traditional gender ideologies among respondents, whose son had a child after the introduction of the father' quota. This suggests that the reform induced also indirect effects through social interaction. With regard to childcare policies, Ellingsaeter et al. (2017) found that a period of substantial increase in childcare availability in Norway has been associated with a considerable increase in the acceptance of formal childcare among all socio-economic groups and in all parts of the country. Yet, they only examined repeated cross-sectional data at two observation times and were unable to consider a direct measure of childcare availability over time.

Our study adds to this research by investigating the effect of greater childcare provision on parents' gender ideologies using a direct measure of public childcare availability. We exploit the temporal and regional variation in the speed at which public childcare has expanded in both

East and West Germany to identify potential influences on changing gender ideologies of parents during a critical life course phase in terms of gender relations. We also draw on the long-standing and persistent variation in cultural ideals between East and West Germany and investigate whether the childcare expansion impacted parents' gender ideologies towards maternal employment differently depending on the cultural context.

4 Conceptual Framework

We develop a theoretical framework, which integrates the concept of policy feedback effects (Kumlin & Stadelmann-Steffen, 2014) with sociological and psychological theories of ideology change over the life course. Policy reform effects on gender ideologies are conceptualized as resulting either from role exposure or also from indirect effects through cultural diffusion of new information by media or social networks. We draw on identity theories (Stets & Burke, 2000) or cognitive dissonance theory (Festinger, 1957) to formulate hypotheses relating to role exposure effects, whereas we use the elaboration likelihood model (Petty & Cacioppo, 1986) to consider indirect effects through information processing.

The concept of policy feedback effects has been widely applied when investigating whether citizens' ideologies or preferences do not only result in future public policies but whether, in addition, these policy changes result in (feedback) effects on citizens' welfare-state-related attitudes (Kumlin & Stadelmann-Steffen, 2014). We apply this concept in order to explain, how policy change, particularly a change in childcare policies, impact on individual-level gender ideologies towards maternal employment. The policy feedback literature emphasizes two causal mechanisms to explain the relationship between policy change and the formation of citizens' welfare ideologies: i) psychological adaptations to role exposure and ii) cultural diffusion and norm-setting effects (Gangl & Ziefle, 2015; Kumlin & Stadelmann-Steffen, 2014). Policy change, such as the childcare expansion, is more likely to affect individuals' ideologies the greater the policy visibility and the policy proximity. Policy visibility refers to "the degree to which a policy is salient to mass publics", whereas policy proximity is understood as "the extent to which it will affect people's lives" (Ellingsæter et al., 2017, p. 152). Policy proximity, therefore, relates closely to perspectives that consider how individuals adapt their identities because of direct exposure to new roles.

Exposure based approaches

According to identity theory and social identity theory (Stets & Burke, 2000), individuals construct both passively and actively new images of themselves whenever they experience new roles

or a change in social category or group, respectively. Frequently such changes occur in the course of life course transitions, including the transition to parenthood or family related employment transitions. According to these exposure-based perspectives, we expect that greater availability of childcare facilities will facilitate maternal labor market re-entry and identification with the role as a working mother. For mothers who are already back at work, a greater childcare provision will enable them to draw on more childcare support and to work longer hours. Due to a change in responsibilities and roles in the family as well as the work sphere, we would expect mothers and their partners to alter their self-concept towards less traditional gender identities and to become more accepting of maternal employment and formal childcare. In addition, one could expect the mediating effect of maternal employment to be particularly strong, when family childcare had been the dominant cultural ideal in a region such as West Germany.

Life course events can also lead to change in gender ideologies as a result of cognitive dissonance, whenever circumstances are constrained and one's beliefs are at odds with new unchangeable behaviors or arrangements connected to these new circumstances (Festinger, 1957). Some authors have suggested that a lack of affordable childcare services increases cognitive dissonance among young mothers with work-oriented values prior to childbirth, raising the likelihood of them adapting their ideology in line with the more traditional division of labor (Baxter et al., 2015; Schober & Scott, 2012). The expansion of childcare services will support mothers in re-entering the labor market or increasing their working hours in line with their preferences. This will result in fewer mothers changing their self-concept to identify with the homemaker role after childbirth.

Elaboration likelihood model

As a second channel of policy feedback effects, policy visibility to the wider public may be relevant to understanding changes in ideologies following policy reforms. The elaboration likelihood model (ELM) (Petty & Cacioppo, 1986) may be used to explain cultural diffusion and norm-setting effects of policy reforms. The model assumes that communication about experiences of significant others or new information may induce attitude change. It further assumes that individuals process information at different levels of thought, called elaboration. It proposes two major routes of persuasion: a central route with a high level of elaboration and a peripheral route with lower levels of elaboration. The central route is used to process information based on arguments and facts, which are carefully elaborated on a high level, whereas information processed on the peripheral route is not carefully elaborated and instead only a rather general message is received.

Change induced by centrally processed information is assumed to be longer-lasting and predictive of behavior, whereas peripherally processed information is more likely to change gender ideologies only temporarily.

In Germany, the exceptional increase in childcare provision was accompanied by a sophisticated media strategy (Bujard, 2014) and continued high level of media coverage, supported by at least annual childcare coverage reports of the Federal Statistical office (Federal Statistical Office, 2015). Given that local and regional newspapers dominate in Germany (Bundesverband deutscher Zeitungsverleger, 2017), media reporting about rising childcare demand, increasing childcare provision and potential benefits of early education and care for child development are highly likely to correlate with regional variations in the expansion of childcare services. In line with this, an evaluation study of various family policies in Germany showed that about 57 per cent of the total population and about 73 of parents knew about the possibilities of formal care for young children already in 2010 (Haumann, 2014). Furthermore, analyzing the Google Search Trends suggests not only an increase in information supply but also in information demand. Between 2007 and 2016, there seems to be a seasonal as well as positive time trend for the search term “Kindergarten”. In addition, Google Trends has registered more search request in West German cities, compared to East Germany (Google Trends, 2017). It can therefore be assumed, that the visibility of the childcare policy change has been high and that the policy change took place in close proximity to the target group of parents with young children. In line with policy feedback theories and the elaboration likelihood model, we expect that the increase in media reporting about formal childcare and in information received from social interactions about the experience of childcare use and employment of mothers with young children has been associated with a change towards growing acceptance of formal childcare and maternal employment.

Hypotheses

Based on the theoretical approaches, we expect that the increase in public childcare places is overall positively associated with short-term changes towards less traditional gender ideologies (*Hypothesis 1*). Following exposure-based theories, we hypothesize that maternal labor market returns will partly mediate the associations of the childcare expansion with less traditional gender ideologies (*Hypothesis 2*). We assume the childcare expansion to have greater policy proximity for mothers compared to fathers, as women are more likely to experience a greater change in roles. Hence, mothers' gender ideologies will be more strongly affected by the policy change (*Hypothesis 3*). Additionally, a pronounced change in gender ideologies is less likely to occur in regions where gender ideologies have already been less traditional and levels of acceptance of

maternal employment and formal care use have already been very high before the childcare expansion. As pre-reform childcare attendance rates in East German counties were much higher than in West Germany, the childcare expansion might have been less visible to parents in East Germany. As the level of disagreement with traditional gender ideologies in East Germany is very high in absolute terms and comparable to Nordic countries, a certain degree of saturation might reduce the potential of further short-term changes towards less traditional gender ideologies. Consequently, we expect West German fathers and mothers to show a more pronounced increase in support of egalitarian gender ideologies (*Hypothesis 4*). Furthermore, even within West Germany the positive effects of greater childcare availability may have been non-linear with larger changes in gender ideologies among parents in West German counties, which started from a very low initial provision of childcare prior to the reform.

One may also expect heterogeneous effects for mothers with different educational qualifications depending on the prevailing levels of acceptance of maternal employment before the reform. The direction of such differences is, however, difficult to predict a priori. On the one hand, college-educated mothers may have been more affected by the reform, as they increased their disagreement with traditional gender ideologies and their take-up of and exposure to formal childcare more than other groups during the expansion period (Stahl & Schober, 2017). On the other hand, college-educated mothers indicated greater work commitment and acceptance of maternal employment and formal childcare for young children (Drasch, 2013; Gangl & Ziefle, 2015) and were probably better informed about potential benefits of formal childcare for children already prior to the reform. We will test empirically whether greater initial acceptance of formal childcare use and better information may go hand in hand with less change among highly-educated parents and offset counteracting effects due to more frequent exposure to childcare institutions and greater potential career gains due to more advantageous labor market opportunities.

5 Method

5.1 Data and Sample

To analyze whether the expansion of public childcare provision has been associated with a change in gender culture among parents in East and West Germany, we combined annual administrative records on childcare provision at the county-level with individual-level data on gender ideologies towards maternal employment from the German Family Panel (pairfam) (<http://www.pairfam.de>), release 7.0 (Brüderl et al., 2016). The annual panel survey started with about 12,000 randomly selected anchor respondents of three cohorts (1991-1993, 1981-1983, and 1971-1973) in 2008 (Huinink, Brüderl, Nauck, & Walper, 2011). Respondents were interviewed

around the turn of the year and the multi-actor design provided information on partners, parents and children, if available. Pairfam is the only German panel dataset, which includes longitudinal measures of attitudes on work-family articulation every other year. We used all wave that include measures on gender ideologies, i.e. items on gender role attitudes, that is wave 1 (2008/2009), wave 3 (2010/2011), wave 5 (2012/2013) and wave 7 (2014/2015).

We restricted the sample to repeatedly observed East and West German mothers and their partners between the ages 20 to 45, who had at least one child, born between October 2008 and April 2015. We excluded teenage mothers, respondents in education and very late births, as we expected dynamics in their gender ideologies to be driven by special circumstances. As a result, we observed only individuals from the cohorts born from 1981 to 1983 and between 1971 and 1973. To restrict variation in the childcare attendance rate to variation due to the policy reform, we further excluded individuals, who moved to another county within the observation period. In total, we observed mothers in 289 of the 402 counties in Germany. In East Germany, our sample included respondents in 67 of 76 East German counties. Based on all restrictions, our sample consisted of 2,116 mothers (5,051 observations) and 1,431 fathers (3,558 observations) in West Germany and 1,220 mothers (2,946 observations) and 892 fathers (2,269 observations) in East Germany.

5.2 Estimation Strategy

Gender ideologies of mothers and fathers might not only be affected by the variation of childcare provision but also by other regional or individual characteristics which cannot be adequately observed in the data, such as long-standing political differences or personality traits. Ignoring such unobserved factors might bias our estimates when estimating ordinary least square regressions. To reduce the risk of bias, we applied fixed effects panel models, which account for any constant unobserved heterogeneity between the time-varying dependent and independent variables by controlling for the average differences across individuals in any observable or even unobservable factor. By exploiting only within-person variation in the dependent and independent variables, our models examine the relationship between changes in gender ideologies and changes in the provision of childcare as well as other time-variant independent variables.

As shown in equation (1), we estimated the association between the variation in the annual county-level childcare provision c_{ct} and the variations in gender ideologies of East and West German mothers and fathers y_{it} living in the same county, respectively. x_{it} and z_{ct} denote vectors of time-varying control variables at the individual, household and county-level, respectively. To account for further influences of time-varying unobserved characteristics, we included period

dummies denoted by vector \mathbf{p}_t . ε_{it} represents random variation at each point in time and \mathbf{u}_i captures the combined effect of time invariant unobserved variables on the dependent variable.

$$(1) y_{it} = \beta_{1t} + \beta_2 c_{ct} + \beta_3 x_{it} + \beta_4 z_{ct} + \beta_5 p_t + u_i + \varepsilon_{it}$$

Due to varying starting levels of childcare provision and acceptance of maternal employment prior to the reform, we ran separate stepwise models for mothers and fathers in West and East Germany, respectively. Our baseline model included only the provision of annual childcare within each county. We then added various time-varying control variables at the individual or household level, which may also induce changes in parents' gender ideologies. Additionally, we controlled for county variation in regional labor markets and in overall economic development, which are likely to influence the provision of childcare and employment participation. In a last step, we tested for a mediating effect of maternal labor market participation. Furthermore, we tested interaction effects to examine whether the effects of the childcare expansion on individual change in gender ideologies varied by respondents' education level. We applied design weights to correct for under- or overrepresentation of the two cohorts in the sample as compared to the population.

5.3 Operationalization of Dependent and Independent Variables

Dependent variables

To investigate how the gradual expansion of childcare provision may have impacted parental ideologies over time, we focused on two items relating to gender ideologies towards maternal employment. At every other wave, pairfam respondents were asked to report their (dis)agreement with the following statements: (1) "Women should be more concerned about their family than about their career" and (2) "A child aged under age 6 will suffer from having a working mother". The response scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), so that higher values represent more traditional gender ideologies. We analyzed the two items considering respondents' attitudes on maternal employment and child well-being separately, as the relationships with the childcare expansion rate varied somewhat. To facilitate comparability of the effect sizes, we standardized the dependent variables in the multivariate analyses.

Table 2.1 displays average attitude scores for mothers and fathers in East and West Germany across all four periods of observation. For all items, patterns of response revealed significantly more traditional gender ideologies among parents in West Germany compared to East German parents as well as for fathers in West and East Germany compared to mothers in both parts of Germany. Whereas moderate change in the mean values towards less traditional ideologies was seen for most items among West German parents, in East Germany ideology change

seemed more ambiguous. Although the means provided little evidence for change in gender ideologies, in particular in East Germany, Table 2.2 displays that the majority of respondents altered their ideologies by at least one point on a five-point scale between two years of observation in both East and West Germany. For example, in West Germany 27 percent of mothers increased and 29 percent of mothers decreased their agreement with the statement that mothers should focus on family rather than career (see Table 2.2). Among the latter group about 73 percent of mothers reduced their score by about one unit between two points of observation, whereas 28 percent even decreased their support by two or more points on the five-point scale. Overall, East German mothers showed the most stable ideologies, whereas West German parents exhibited greater change.

Independent variables

Our key independent variable was the provision of public childcare places at county-level, measured as the annual percentage of children aged under three years who were enrolled in publicly funded childcare services in relation to the total population of this age group. Due to substantial excess demand for childcare places (BMFSFJ, 2015), this may also be interpreted as a measure of childcare supply or availability (Andronescu & Carnes, 2015). The childcare measure included half-day and full-day slots and the observed temporal and the regional variation in the childcare attendance rate in our sample was in line with the overall development of childcare provision (Strunz, 2015). As shown in Table 2.3, the childcare attendance rate was substantially higher in East German counties compared to West German regions and increased gradually over time in both parts of Germany.

We included the following time-varying control variables at the individual and household level: Respondent's age and age squared, age group of the youngest child (0-3 years/4-6 years/7 years and older), number of children in the household and relationship status, differentiating between living apart together, cohabiting, and married respondents. As employment transitions have been found to correlate with ideology changes (Schober & Scott, 2012) and may mediate the relationship with the childcare expansion, we tested mediating relationships with changes in mothers' employment status, by differentiating between economically inactive, part-time and full-time employed mothers. We also considered a dummy variable of paternal employment and a logged indicator of the monthly net equivalence income adjusted for inflation with base year 2010. Furthermore, we controlled for county variation in regional labor markets and the overall economic situation by including the regional unemployment rate, GDP per capita and the number of public servants per 1000 inhabitants because the public service sector is an important

Table 2.1 Mean and differences in gender ideologies measures across waves of mothers and fathers in East and West Germany

Variable	Mothers			Fathers		
	W 1	Difference	N	W 1	Difference	N
West Germany						
(1) Women should be more concerned about their family than about their career	3.0	-0.13***	5051	2.9	-0.22***	3558
(2) A child aged under age 6 will suffer from having a working mother	2.7	-0.32***	5036	3.1	-0.30***	3548
East Germany						
(1) Women should be more concerned about their family than about their career	2.6	-0.08	2949	2.5	-0.02	2269
(2) A child aged under age 6 will suffer from having a working mother	2.0	-0.17***	2946	2.1	-0.08	2261

Note: Higher values indicate stronger agreement with the statements, i.e. more traditional attitudes.

Numbers shown in italics represent mean differences in attitudes among waves with t-Test. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: pairfam, waves 2008-2015.

Table 2.2 Within-person changes in attitude scores across waves in per cent

	(1) Family vs. Career			(2) Child will suffer		
	Decrease	Increase	Total	Decrease	Increase	Total
West Germany						
Mothers	29.25	26.91	100	28.82	25.59	100
Fathers	29.82	25.57	100	28.63	27.16	100
East Germany						
Mothers	28.44	26.72	100	24.57	23.02	100
Fathers	26.69	27.36	100	25.51	25.85	100

Source: pairfam, waves 2008-2015.

employer, particularly for women. To further account for regional differences in employment opportunities but also disparities in municipal budgets between urban and rural areas as well as more traditional social norms in rural areas, we included an index for the share of a county's population that lives in communities with a very low population density. All regional indicators were annual figures provided by the Regional Database Germany. To account for further unobserved influences, which changed uniformly across regions over time, we included period dummies in all models.

Table 2.3 Descriptive statistics of dependent and independent variables

Variable	West Germany				East Germany			
	Mothers		Fathers		Mothers		Fathers	
	M/%	SD	M/%	SD	M/%	SD	M/%	SD
<i>Individual level variables</i>								
Item item 1: family vs. career	2.92	1.13	2.86	1.12	2.59	1.12	2.54	1.09
Item item 2: child suffers	2.56	1.34	2.91	1.34	1.96	1.17	2.11	1.21
Age	35.65	5.03	38.14	5.43	34.43	5.24	37.22	5.45
Cohort 1981-1983	0.27	0.44	0.16	0.37	0.38	0.48	0.22	0.41
Cohort 1971-1973	0.72	0.45	0.83	0.37	0.61	0.49	0.78	0.41
Migration background	0.24	0.43	0.20	0.40	0.11	0.31	0.08	0.28
Education low (ref.)	0.12	0.32	0.07	0.26	0.07	0.25	0.06	0.23
Education middle	0.59	0.49	0.50	0.50	0.62	0.49	0.61	0.49
Education high	0.30	0.46	0.43	0.49	0.31	0.46	0.33	0.47
Number of children: 1	0.30	0.46	0.28	0.45	0.39	0.49	0.34	0.47
Number of children: 2	0.47	0.50	0.48	0.50	0.45	0.50	0.49	0.50
Number of children: 3 or more	0.23	0.42	0.23	0.42	0.16	0.37	0.17	0.38
Age of youngest child 0-3 (ref.)	0.42	0.49	0.44	0.50	0.44	0.50	0.44	0.50
Age of youngest child 4-6	0.22	0.42	0.22	0.42	0.20	0.40	0.21	0.41
Age of youngest child 7-	0.36	0.48	0.33	0.47	0.36	0.48	0.35	0.48
Living apart together (ref.)	0.04	0.20	0.01	0.09	0.05	0.23	0.02	0.13
Cohabitation	0.09	0.28	0.08	0.28	0.29	0.45	0.28	0.45
Married	0.87	0.34	0.91	0.29	0.65	0.48	0.70	0.46
Net equivalence income (Euro)	1720.07	1011.25	1791.58	1232.14	1508.51	758.05	1567.79	765.75
Father employed	0.96	0.20	0.96	0.20	0.93	0.26	0.92	0.27
Mother not employed (ref.)	0.32	0.47	0.33	0.47	0.30	0.46	0.28	0.45
Mother part-time employment	0.52	0.50	0.52	0.50	0.33	0.47	0.34	0.47
Mother full-time employment	0.16	0.37	0.15	0.36	0.37	0.48	0.38	0.49
<i>County-level variables</i>								
Childcare rate	20.02	7.17	20.24	7.16	49.69	6.91	49.68	6.93
Childcare rate squared	452.20	310.57	461.02	312.86	2517.38	683.71	2515.74	685.63
Rate of public servants/10.000	129.46	46.73	128.21	47.07	134.15	56.27	136.22	55.28
Unemployment rate	5.99	2.62	6.01	2.64	10.94	2.48	10.98	2.40
GDP per capita	32.39	12.45	32.41	12.35	24.58	5.72	24.76	5.76
Index for low population density	24.75	27.62	25.29	27.87	36.36	29.58	35.53	29.86

Note: Higher scores indicate stronger agreement with the statements, i.e. more traditional gender ideologies.

Source: pairfam, waves 2008-2015.

6 Results

Table 2.4 shows results of the fixed effects regressions models of mothers' and fathers' change in gender ideologies in West and East Germany, respectively. The final models include a curvilinear specification of the childcare measure. We present full models including control variables at the

individual, household and county-level, and year dummy variables, as intermediate modeling steps did not alter the associations with the childcare expansion rate significantly.

Among mothers in West Germany, the expansion in childcare provision was significantly associated with a decrease in the support of the traditionally slanted attitude statements considering women's careers and employment of mothers with preschool children (Table 2.4). The relationships appeared to be curvilinear with greater change towards less traditional ideologies in counties where childcare availability increased from lower levels, i.e. between 5 and 24 percent of childcare take-up, whereas attitudes remained more stable in counties with higher levels of childcare provision above 24 percent. The curvilinear relationship was confirmed by applying a significance test. For fathers in West Germany and for mothers and fathers in East Germany the expansion of childcare availability was not significantly associated with changes in gender ideologies (Table 2.4).

The significant results for West German mothers provided only partial support for our *Hypothesis 1*, assuming that the increase in public childcare provision was associated with a change towards less traditional gender ideologies. The effect sizes were modest ranging between 3 and 4 percent of a standard deviation, which correspond to the mostly moderate influences of similar regional-level indicators found in previous studies (e.g., Grunow & Müller, 2012; Schober & Spiess, 2015; Schober & Stahl, 2016). Among West German mothers, a 10-percentage point increase in childcare provision was associated with a 30-percent decrease in attitudinal support towards less traditional ideologies towards women's careers, which corresponded to a decrease of 0.34 points on the five-point scale. The observed patterns among East German mothers and fathers in Table 2.4 contradicted *Hypothesis 1*. East German parents' views regarding women's careers and negative consequences of maternal employment for young children appeared to have become more conservative in counties where childcare provision expanded, although the coefficients were statistically not significant.

Partly in line with *Hypothesis 2* and exposure-based explanations, maternal transitions into part-time or full-time employment correlated negatively and employment exits positively with agreement with the traditionally phrased attitude items in several models for mothers and fathers in West Germany (Table 2.4). However, shifts in gender ideologies were not consistently stronger for full-time compared to part-time employment across various models. Furthermore, we did not find any mediating or moderating influences of maternal employment status (results of stepwise models and interaction terms are available from the authors). In East Germany, maternal employment transitions were mostly not significantly related to ideology changes.

Table 2.4. Fixed effects regression models for mother's and father's gender ideologies

Predictor	Mothers				Fathers			
	(1) Career		(2) Child		(1) Career		(2) Child	
<i>West Germany</i>	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE
County-level childcare rate (%)	-0.030*	0.014	-0.035*	0.014	-0.003	0.016	0.016	0.016
County-level childcare rate squared (%)	0.001*	0.000	0.001**	0.000	0.000	0.000	0.000	0.000
<i>Individual-level controls</i>								
Age	-0.087	0.083	-0.217**	0.062	-0.108	0.087	0.125	0.079
Age squared	-0.000	0.001	0.002*	0.001	-0.001	0.001	-0.001+	0.001
Number of children: 2	0.104	0.064	0.107+	0.055	0.063	0.058	-0.016	0.060
Number of children: 3 or more	0.092	0.109	0.221*	0.092	0.156	0.099	-0.004	0.111
Age of youngest child 4-6	0.027	0.039	-0.012	0.039	0.028	0.045	-0.049	0.044
Age of youngest child 7-	-0.022	0.062	0.086	0.054	0.010	0.077	0.068	0.073
Cohabiting	-0.325**	0.114	-0.145	0.096	-0.059	0.159	-0.106	0.188
Married	-0.244*	0.114	-0.049	0.096	-0.046	0.183	-0.009	0.199
Net equivalence income (Euro)	0.058	0.045	0.094*	0.039	-0.027	0.061	-0.040	0.060
Father working	0.040	0.080	0.046	0.066	-0.119	0.095	0.051	0.106
Mother part-time employment	-0.073+	0.040	-0.104**	0.037	-0.047	0.039	-0.144**	0.048
Mother full-time employment	-0.147*	0.068	-0.127*	0.056	-0.107	0.074	-0.153*	0.076
<i>County-level controls</i>								
rate of public servants per 10.000	0.002	0.004	0.001	0.004	-0.003	0.003	-0.003	0.004
unemployment rate	-0.006	0.047	0.009	0.041	0.058	0.050	0.047	0.052
GDP per capita	-0.015	0.010	-0.008	0.007	-0.011	0.011	0.001	0.010
Index for low population density	-0.028	0.029	0.031*	0.015	0.025	0.027	0.020	0.018
Constant	4.152+	2.267	4.356*	1.797	4.562	2.854	-3.089	2.547
Observations N	5051		5036		3558		3548	
Individuals n / Counties	2116 / 222		2115 / 222		1431 / 206		1432 / 206	
R2_w	0.015		0.028		0.020		0.022	
F	2.073		4.299		2.255		2.466	
p	0.003		0.000		0.001		0.000	
<i>East Germany</i>								
	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE
County-level childcare rate (%)	0.013	0.054	0.067	0.047	0.079	0.050	0.087	0.068
County-level childcare rate squared (%)	-0.000	0.001	-0.001	0.000	-0.001	0.001	-0.001	0.001
<i>Individual-level controls</i>								
Age	-0.018	0.060	-0.051	0.080	-0.101	0.143	0.067	0.101
Age squared	0.002+	0.001	0.002+	0.001	0.001	0.001	-0.001	0.001
Number of children: 2	0.077	0.106	0.062	0.070	0.087	0.109	-0.056	0.102
Number of children: 3 or more	0.205	0.206	0.143	0.120	-0.057	0.216	0.018	0.196
Age of youngest child 4-6	0.007	0.051	0.110*	0.053	0.012	0.053	0.105+	0.057
Age of youngest child 7-	0.206**	0.073	0.183*	0.082	-0.029	0.085	0.193+	0.105
Cohabiting	-0.121	0.115	0.141	0.140	-0.095	0.244	0.172	0.207
Married	-0.111	0.122	0.270+	0.144	-0.013	0.268	0.408+	0.227
Net equivalence income (Euro)	0.053	0.077	-0.024	0.088	-0.014	0.094	-0.042	0.074
Father working	-0.071	0.087	-0.082	0.135	-0.067	0.112	-0.210+	0.106
Mother part-time employment	-0.008	0.057	-0.165*	0.070	-0.027	0.067	-0.075	0.069
Mother full-time employment	-0.043	0.072	-0.058	0.069	-0.071	0.062	-0.070	0.066
<i>County-level controls</i>								
rate of public servants per 10.000	-0.001	0.003	-0.002	0.003	0.003	0.004	0.003	0.003
unemployment rate	-0.014	0.031	0.029	0.036	0.030	0.047	0.021	0.045
GDP per capita	-0.016	0.030	-0.006	0.020	0.045	0.034	-0.027	0.034
Index for low population density	-0.018	0.015	-0.001	0.016	0.002	0.014	-0.001	0.028
Constant	0.023	2.024	-1.846	2.134	-0.899	4.430	-3.685	3.494
Observations N	2949		2946		2269		2261	
Individuals n / Counties	1219 / 67		1220 / 67		892 / 66		890 / 66	
R2_w	0.020		0.020		0.017		0.027	
F	5.450		2.819		3.517		1.679	
p	0.000		0.000		0.000		0.051	

Note: Higher scores indicate more traditional gender ideologies. All models include year dummy variables.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Source: pairfam, waves 2008-2015.

In line with *Hypothesis 3*, joint models with a gender interaction term confirmed that the increasing childcare provision was associated with significantly greater change towards less traditional gender ideologies with respect to maternal employment for mothers than for fathers in West Germany. For the other item and for East Germany, no significant gender differences were found (results available on request).

Hypothesis 4 predicted a greater potential of an expansion of childcare availability to shape gender ideologies in West Germany than in East Germany. Overall, the results for mother's ideologies towards women's careers were in line with this hypothesis. Joint models with an interaction term for East Germany confirmed a significant change towards less traditional gender ideologies towards women's careers and consequences of maternal employment for child wellbeing among West German than East German mothers (results available on request). For fathers we did not find any statistically significant differences between East and West Germany.

Table 2.5 shows the results of models including interaction terms of the childcare attendance rate with a dummy variable indicating whether the respective parent has completed a college degree. The interaction effects suggested that in West Germany the expansion of childcare provision was associated with stronger change towards less support regarding the 'career item' among mothers with lower levels of education compared to college-educated mothers. With regard to East Germany, the negative interaction terms for the 'child item' suggested that the expansion of childcare provision were accompanied by a stronger change towards more egalitarian ideologies among college-educated mothers than among those with lower levels of education, whose gender ideologies became more traditional. Among fathers in East and West Germany, none of the interaction terms reached statistical significance at the 5-percent level.

Sensitivity Analyses

As a robustness check we tested a potential mediating influence of actual use of part-time or full-time formal childcare in addition to maternal employment participation. As information on childcare use has only been collected for waves 3 to 7, we could not include this measure in our main models. Including the use of formal childcare, however, did not alter our main findings for West German mothers (see supplemental Table A2.6). The association of county-level changes in childcare provision and mothers' gender ideologies towards the consequences of maternal employment ceased to be significant but this was due to the reduction in sample size. In addition, we tested regional variation in the provision of full-day care slots but did not find any statistically significant associations. Moreover, we found no indication that our results are driven

by a particular state or a group of federal states. We also checked whether the effects were dominated by changes in ideologies among one of the two cohorts in our sample or varied by youngest child's age, parent's migration background or family status but found no evidence of this.

Table 2.5 Fixed effects regression models for mother's and father's gender ideologies considering interactions with education

Predictor	Mothers				Fathers			
	(1) Career		(2) Child		(1) Career		(2) Child	
<i>West Germany</i>	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE
Childcare rate (%)	-0.040*	0.015	-0.037*	0.016	-0.002	0.019	0.019	0.023
Childcare rate squared (%)	0.001**	0.000	0.001**	0.000	0.000	0.000	-0.000	0.001
College degree X childcare rate	0.049*	0.022	0.008	0.018	0.022	0.019	0.011	0.027
College degree X childcare rate squared	-0.001	0.000	-0.000	0.000	-0.000	0.000	0.000	0.001
Constant	3.808+	2.290	4.341*	1.800	4.026	2.919	-3.486	2.573
Observations N	5051		5036		3558		3548	
Individuals n	2116		2115		1431		1432	
Counties	222		222		206		206	
R2_w	0.019		0.028		0.026		0.025	
F	2.297		4.064		2.813		2.598	
P	0.001		0.000		0.000		0.000	
<i>East Germany</i>	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE
Childcare rate (%)	0.037	0.065	0.114+	0.060	0.085+	0.049	0.109	0.067
Childcare rate squared (%)	-0.001	0.001	-0.001+	0.001	-0.001+	0.001	-0.001+	0.001
College degree X childcare rate	-0.056	0.090	-0.158*	0.073	-0.012	0.092	-0.034	0.069
College degree X childcare rate squared	0.001	0.001	0.002*	0.001	0.000	0.001	0.001	0.001
Constant	-0.496	1.964	-2.046	2.191	-1.066	4.483	-4.537	-0.496
Observations N	2949		2946		2269		2261	
Individuals n	1219		1220		892		890	
Counties	67		67		66		66	
R2_w	0.022		0.022		0.017		0.031	
F	5.794		2.875		3.296		1.870	
P	0.000		0.000		0.000		0.022	

Note: Higher scores indicate more traditional gender ideologies. All models include: Respondent's age and age squared, number of children, age of the youngest child, marital status, net equivalence income, father's employment, year dummies, the percentile of public servants, unemployment rate, GDP per capita and the index for low population density.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: pairfam, waves 2008-2015.

7 Concluding Discussion

Focusing on a major public childcare expansion in Germany, this study provides evidence that a pronounced change in childcare policy has been associated with short-term changes in individual-level gender ideologies. Our results show that gender ideologies of West German mothers have become less traditional when experiencing a pronounced increase in childcare provision for under-three-year-olds in counties with low levels of provision (below 25 percent). This effect was driven by mothers without a college degree. By contrast, we find tentative evidence that less educated mothers in East Germany became more traditional in their gender ideologies towards employment of mothers with young children as childcare provision expanded in their counties.

We did not find significant associations for fathers in East and West Germany. Despite a strong association of maternal employment transitions with gender ideologies among parents in West Germany, we did not find that employment transitions mediate or moderate the relationship of the childcare expansion with changes in gender ideologies. This may point to indirect mechanisms through changes in information about childcare provided by media and social network.

The non-linear relationship with the childcare attendance rate in combination with the finding of a significant difference between West and East Germany may suggest that pronounced change in gender ideologies among mothers is more likely in previously relatively traditional contexts. However, as we observe only a few mothers in West German counties with a particularly pronounced increase in childcare availability to more than 35 percent, the curvilinear relationship must be interpreted with caution. Differentiated analysis by parental education revealed stronger change towards less traditional gender ideologies among lower educated mothers in West Germany. This might suggest that less educated mothers in West Germany who held the most traditional values (Stahl & Schober, 2017) and showed a comparatively weak attachment to the labor market before the childcare expansion (Drasch, 2013; Konietzka & Kreyenfeld, 2010), were receptive to information about newly available childcare services. In combination with the finding of persistent and low levels of childcare take-up and employment of less educated mothers (Stahl & Schober, 2017) across the reform period, this result may suggest that their take-up may have been restricted because of priority access to dual-earner parents or due to personal preferences of longer labor market interruptions. The weaker effects on fathers' gender ideologies in West Germany are in line with the policy effect literature that suggests that changes in childcare practices and associated changes in maternal employment have been of greater impact for mothers' gender ideologies, who have been more directly affected in their work and care arrangements.

While one may assume a certain degree of saturation effect with regard to further short-term changes towards less traditional gender ideologies among East German parents due to the high level of rejection of traditional ideologies prior to the reform, our results surprisingly suggest a change towards more traditional ideologies among mothers with less than college education. Although East German parents probably internalized the dominant role of a working mother through early socialization before the German reunification, they also most likely experienced persistent gender inequalities in the domestic sphere as well as a period of an increased work-family conflict due to social and economic insecurity following reunification (Banaszak et al. 2006). For some less educated mothers, who held non-traditional values before the reform, further employment-promoting family policies in combination with persistently lower job pro-

spects in the East German labor market might reduce mothers' career ambitions (Stahl & Schober, 2017). In addition, increasing discussions about low levels of quality of formal childcare institutions, particularly in East Germany, might impact negatively on maternal employment transitions and reduce cultural acceptance of formal care use for young children. Previous research has shown a significantly negative association between larger group sizes and maternal employment participation only for mothers in East Germany (Schober & Spiess, 2015).

Overall, our results lend support to the literature on the relevance of life course effects on gender ideologies, particularly to the impressionable years hypothesis (Alwin & Krosnick, 1991) which assumes that preferences and attitudes of young adults may be subject to considerable change. From a broader perspective, our results confirm previous cross-national comparisons (Kangas & Rostgaard, 2007; Sjöberg, 2004), which found childcare provisions to predict variations in individuals' gender ideologies. In line with a few recent evaluations of family policy reforms (Ellingsæter et al., 2017; Gangl & Ziefle, 2015; Kotsadam & Finseraas, 2011; Unterhofer & Wrohlich, 2017), this study provides evidence that family policy reforms, in this case an expansion of childcare services, may facilitate change in gender ideologies not only across cohorts but also over the life course. However, our findings emphasize that the impact of this institutional change seems to be of moderate size and concentrated among counties with low levels of previous childcare provision and among respondents with greater policy proximity due to a higher likelihood of role exposure and social interaction with other individuals from the policy target group. In contrast to previous studies, we also find some tentative evidence of re-traditionalizing effects of the childcare expansion on less educated mothers within the relatively egalitarian gender culture of East Germany.

Finally, a number of important limitations need to be considered. Firstly, we had to rely on a few traditionally slanted gender role attitude items, which may be less suitable to measure attitude change among a sample with relatively egalitarian views such as East German parents. In addition, attitudinal measures were available only every other year, which might have hindered us from capturing all relevant individual trajectories in order to control for any other potential sources of attitudinal change. We also lacked available data to measure childcare use at all points of observation as well as to consider the quality of regional childcare provision, which, however, remained roughly stable over time (Schilling, 2014). Whereas it is always difficult to disentangle the association between institutional change and cultural change, the longitudinal data in combination with regional measures on childcare provision are unique, to identify attitudinal changes during the corresponding childcare expansion period. However, due to data limitations we were not able to account for any delayed attitudinal change across time, which might have been enforced by the previous change in parental leave legislation. For this reason,

our results might capture not only effects of the childcare expansion but also more general social change accompanying the paradigm shift in German family policy. By applying fixed effects regression models, we account for time-invariant unobserved heterogeneity at the individual level, yet, there remains a small risk of bias due to other unobserved time-varying characteristics at the county-level which correlate with the childcare expansion.

Despite these limitations the study makes an important contribution by emphasizing the relevance of attitudinal change over the life course. As this is one of the first studies investigating the association between social policy and change in gender ideologies over the life course, future research should look more into direct as well as indirect mechanisms. These include norm-setting effects, increasing receipt of different forms of information from media or social network, and changing exposure and daily practices of how policy reforms may impact gender ideologies.

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Appendix

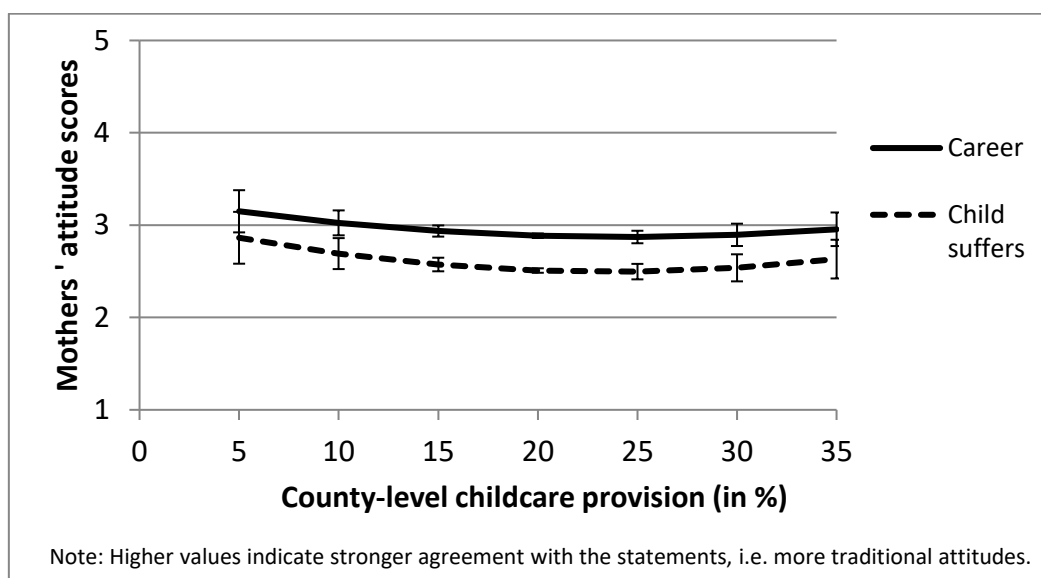


Figure A2.1 Predictive margins for West German mothers

Table A2.6 Fixed effects regression models for West German mother's gender ideologies including childcare take-up

Predictor	(1) Career				(2) Child			
	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE	<i>b</i>	RSE
Childcare %	-0.032	0.021	-0.032	0.021	-0.015	0.016	-0.015	0.016
Childcare squared %	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Childcare take-up part-time			-0.055	0.054			-0.038	0.047
Childcare take-up full-time			-0.033	0.060			-0.019	0.055
Constant	3.910	3.826	3.676	3.766	5.037+	2.877	4.888+	2.927
Observations N	3430		3430		3421		3421	
Individuals n	1697		1697		1698		1698	
Counties	216		216		216		216	
R2_w	0.016		0.017		0.021		0.022	
F	2.076		1.999		2.108		1.920	
p	0.006		0.007		0.005		0.010	

Note: Higher values indicate more traditional ideologies. All models include: Mother's age and age squared, number of children, age of the youngest child, marital status, net equivalence income, father's employment, year dummies, the percentile of public servants, unemployment rate, GDP per capita and the index for low population density.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: pairfam, waves 2008-2015.

Chapter 3 The Expansion of Low-Cost, State-Subsidized Childcare Availability and Mothers' Return-to-Work Behaviour in East and West Germany *

Abstract

This study investigates whether increased availability of low-cost, state-subsidized childcare for under 3-year-olds in Germany is associated with shorter employment interruptions amongst mothers. By focusing on a major childcare reform in East and West Germany, we examine the effect in two contexts that differ markedly in the acceptance and use of formal childcare and maternal employment. We combine rich longitudinal data from the German Socio-Economic Panel (2006–2014) with annual administrative county-level data on the availability of low-cost, state-subsidized childcare, estimating event history models. The results indicate that increased childcare availability for under 3-year-olds reduces mothers' employment interruptions, particularly after a second childbirth, and increases the probability of returning to part-time or full-time employment as opposed to marginal employment. Furthermore, increased availability of low-cost, state-subsidized childcare increases mothers' likelihood of returning to employment in the second year after childbirth, when paid leave entitlements expire and the availability of childcare becomes important. However, our results are only statistically significant for West German mothers and only after the birth of a second child. The study extends the literature on women's return-to-work behaviour by providing evidence on the medium-term impact of family policy on the duration of mothers' employment interruptions.

Keywords: childcare, duration of employment interruption, early childhood education, family policy, maternal employment, social policy

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1 Introduction

Germany has a long history as a *conservative welfare state* with low maternal labour force participation (Hanel and Riphahn, 2012), long employment interruptions after childbirth (Ziefle and Gangl, 2014), and a substantial motherhood penalty (Gangl and Ziefle, 2009). Long job-protected parental leave periods with low compensation and low childcare availability have encouraged the traditional male-breadwinner model, particularly in West Germany. Even 26 years after reunification, Germany remains a divided country, with East German mothers returning to employment faster after childbirth and more often to full-time employment than West German mothers (Grunow and Müller, 2012; Hanel and Riphahn, 2012). These persistent East-West differences have been frequently explained with greater availability of low-cost, state-subsidized childcare for under 3-year-olds in East Germany (Grunow and Müller, 2012; Kreyenfeld and Geisler, 2006).

Since 2005, the German government has made immense public investments to increase childcare services for under 3-year-olds to encourage faster returns to full-time employment among East and West German mothers. However, to the best of our knowledge, no study to date has addressed the question whether increased availability of low-cost, state-subsidized childcare actually reduces mothers' employment interruptions after childbirth. Studying mothers' interruption durations and therein resulting return-to-work behaviour is important to understand persistent gender inequalities. Long family-related employment interruptions do not only result in a traditional division of labour and an immediate loss of income for women but also tend to place mothers on lower career and income trajectories over their life course, resulting in higher job insecurity and lower pension entitlements (Sigle-Rushton and Waldfogel, 2007).

We contribute to the literature on the effects of childcare availability, by focusing on a major public childcare reform in Germany, and investigate whether increased availability of low-cost, state-subsidized childcare shortens mothers' employment interruptions after childbirth. We link rich individual and household panel information from the German Socio-Economic Panel (SOEP) (2006–2014) with annual administrative records on childcare availability on the county-level (*Kreisebene*) to exploit large temporal and regional variation in childcare availability across counties within and between East and West Germany. By estimating separate event history models for East and West Germany, we study how the childcare effect varies in two contexts that differ markedly in their initial levels of childcare availability and the acceptance of non-parental care and maternal employment.

2 Institutional Context and Childcare Expansion

Up to the mid-2000s, Germany provided long parental leave periods with low compensation and limited state-subsidized childcare availability for under 3-year-olds, particularly in West Germany.²⁸ Together with joint taxation, family health insurance, and generous child benefits (Bach *et al.*, 2011) this family policy setting encouraged especially West German mothers to take long career breaks of more than 3 years and to return most commonly to part-time employment (Frodermann, Müller and Abraham, 2013). Although recent parental leave reforms have particularly encouraged shorter employment interruptions among West German mothers (Bergemann and Riphahn, 2015; Ziefle and Gangl, 2014). East German mothers still return to work sooner, and more often in full-time employment. This strong labour market attachment is often described as the legacy of the former German Democratic Republic, where paid maternal leave periods were comparatively short and childcare was widely available (Rosenfeld, Trappe and Gornick, 2004). After the German reunification, childcare availability was reduced in East Germany; however, East-West disparities in childcare availability persisted. Hence, in early 2006, before the start of the childcare expansion, more than 30 per cent of all under 3-year-old children in East Germany attended low-cost, state-subsidized childcare, whereas in West Germany, counties seldom reached levels above 20 per cent (Federal Statistical Office, 2008).

In the mid-2000s, the government started to implement a major childcare expansion aiming to speed up mothers' returns to employment, particularly in West Germany. Although nationally funded, the reform is planned and implemented by the German federal states and county-level authorities. In 2005 and 2008, two federal laws were passed to increase county-level availability of low-cost, state-subsidized childcare for under 3-year-olds to at least 35 per cent by 2013, including the legal right to childcare for all children aged more than or equal to 1 year that went into effect in August 2013.²⁹ In 2014, 52 per cent of under 3-year-olds in East Germany attended a childcare institution, compared to 27 per cent in West Germany, where a childcare availability of more than 20 per cent became accessible only after 2009. However, these averages

²⁸ Despite the lack of state-subsidized childcare availability for under 3-year-olds in West Germany, incentives for private providers were low due to high-quality requirements and no or limited subsidies. As a result, up to 2006 less than 2 per cent of children attended for-profit providers (Spieß, Berger and Groh-Samberg, 2008) and less than 5 per cent used informal paid care such as nannies or au-pairs (Schober, 2014).

²⁹ To date, the legal right is not easily enforceable, as only few parents have taken legal action against regional authorities, and these cases are still unsettled. In principle in 2016 the top court decided that employed parents are entitled to financial compensation (Financial Times, 2016). However, with only few observations available after August 2013, this article focuses on the gradual expansion of childcare availability.

mask great regional variation in the childcare ratio, ranging from 45 to 63 per cent in East Germany and from 14 to 47 per cent in West Germany (Strunz, 2015).³⁰

Along with formal childcare, previous research shows that return to work behaviour is also closely linked to parental leave benefits. Since 2007, parents receive an income-related paid parental leave for a period of 12 months, which parents can divide between them and extend it to 14 months if one partner takes at least 2 months. Parental leave is paid at 65–67 per cent of net earnings before childbirth (capped at 1,800 Euros), and parents are provided with a 3-year job guarantee.

This description of the institutional context highlights how the interaction of various family policies and a lack of low-cost, state-subsidized childcare have long encouraged the male-breadwinner model, particularly in West Germany, whereas greater availability of low-cost, state-subsidized childcare prior to the reform seems to have effectively supported maternal employment among East German mothers. With the recent increase in childcare availability in West Germany and additional capacities implemented in East Germany, the question remains whether this has led to shorter interruption durations.

3 Previous Research

So far, research has focused almost exclusively on the effect of formal childcare on maternal labour supply, as opposed to the interruption duration after childbirth, providing mixed results. International studies, exploiting exogenous quasi-experimental reform variation in childcare availability, can be summarized as follows: while some studies show positive employment effects (see Morrissey, 2017 for an overview), with some studies finding larger effects when the childcare availability was low prior to an expansion (Brilli, Del Boca and Pronzato, 2016 on Italy), others find small or no significant effects (Lundin, Mörk and Öckert, 2008 on Sweden; Havnes and Mogstad, 2011 on Norway). These small or insignificant estimates are explained with heterogeneous reform effects or with substitution effects of households using low-cost, state-subsidized childcare instead of informal care or costly private formal care (Havnes and Mogstad, 2011).

To our knowledge, no study to date has addressed the question of whether the availability of low-cost, state-subsidized childcare is associated with shorter employment interruptions after childbirth. Germany, with its recent childcare expansion, provides an interesting case study to analyse this effect. International findings on the effects of other childcare expansions are not

³⁰ In light of the limited but state-subsidized childcare in Germany, it appears to be the availability rather than the cost of childcare that matters (Kreyenfeld and Hank, 2000). Since state subsidies cover approximately 85 per cent of the costs per slot, parents only pay an income-dependent fee of approximately 14 per cent of the total costs, which is well below the average of Organisation for Economic Co-operation and Development countries (Schober, 2014).

applicable, as Germany, in particular West Germany, had an unusually low level of both private and state-subsidized childcare prior to the reform. Also with regard to welfare or family policy regime typologies, Germany has become a unique exception, as it combines family policies which reinforce the traditional *male-breadwinner model*, such as joint taxation and family health insurance, with recent policies which support the *dual-earner dual-carer model*, in particular, the parental leave and childcare policies (Schober, 2014). In sum, due to the division of Germany, East and West Germany provide the opportunity to investigate the effect of increased availability of low-cost, state-subsidized childcare in two contexts that differ remarkably in their pre-reform levels of childcare availability, maternal employment as well as cultural attitudes towards work and care for young children. The persistent East-West differences in maternal employment and employment interruption durations have been frequently explained by greater childcare availability in the East (Grunow and Müller, 2012). However, no study to date has applied administrative childcare data to systematically analyse whether the gap in childcare availability between East and West Germany is responsible for the East- West difference in maternal employment and employment interruption durations. Pre-reform studies show no statistically significant association between childcare availability and maternal employment (Kreyenfeld and Hank, 2000; Büchel and Spieß, 2002). These cross-sectional studies, however, focus exclusively on the unusually low level of childcare in West Germany and were unable to consider substantial changes in childcare availability over time, which may explain the non-significant effects.

To date, the few post-reform studies provide mixed evidence on the effects of the recent childcare expansion in Germany. However, they again concentrate on maternal labour supply instead of on employment interruption durations after childbirth, without focusing on East-West differences. Micro-simulations predict the childcare expansion (Haan and Wrohlich, 2011; Bonin *et al.*, 2013) and the legal entitlement to a childcare slot for all children aged more than or equal to 1 year (Müller and Wrohlich, 2016) to increase maternal employment. Applying a quasi-experimental design, Geyer, Haan and Wrohlich (2015) show a positive effect on maternal labour supply, particularly among mothers with children aged 2–3 years, confirming the micro-simulations. In contrast, while distinguishing between East and West Germany, but using only a cross-sectional research design, Schober and Spieß (2015) do not find a statistically significant effect of childcare availability on maternal labour supply once they control for childcare quality.

Our study adds to the current field of research by investigating the effect of an increased availability of low-cost, state-subsidized childcare on the length of East and West German mothers' employment interruption durations. We exploit the annual and regional variation in county-level administrative childcare and survey data, measuring actual employment behaviour instead

of relying on simulation models. Additionally, we investigate whether the effect differs after the birth of a first or a second child and whether the effect is more pronounced when the paid parental leave benefits expire and the opportunity costs of employment increase in the second year after childbirth, as suggested by previous studies (Haan and Wrohlich, 2011; Geyer, Haan and Wrohlich, 2015). Furthermore, we assess whether increased availability of low-cost, state-subsidized childcare alters the likelihood of returning to more substantial (full-time or part-time) employment compared to marginal employment (so-called 'mini-jobs'), which is defined by a maximum monthly income of 400 Euro (after 2013, 450 Euros) and no social insurance contributions for employees.

4 Theoretical Framework

Based on both economic and sociological theories, we assume that increased availability of low-cost, state-subsidized childcare shortens mothers' employment interruptions and facilitates faster returns to more substantial employment.

Overall, economic theory predicts shorter employment interruptions whenever low-cost, state-subsidized childcare availability for very young children is comparatively high (Kreyenfeld and Hank, 2000; Morrissey, 2017). According to the neoclassical theory of labour supply, mothers rationally decide when to return to work after giving birth to maximize lifetime income as well as household utility by considering their time requirements at home, market wages as well as alternative income sources such as household income (Blau, Ferber and Winkler, 1998). Low-cost, state-subsidized childcare reduces the opportunity costs for a return to work and allows mothers living in counties with greater availability to rely more on childcare than in counties with lower availability (for a more in-depth discussion, see Leibowitz, Klerman and Waite, 1992). In this theory, mothers who are indifferent about taking care of a child at home instead of enrolling the child in childcare will return to employment faster in a county with increased childcare availability than mothers who live in counties with lower availability. Beyond this, mothers might also decide based on the expectation that employers consider the duration of the interruption a signal of their productivity and work commitment (Spence, 1973). With widely available low-cost, state-subsidized childcare, more mothers have the possibility to return to work faster and to thereby signal higher work commitment to employers.

Similarly, sociological theory suggests that formal childcare has the potential to reduce inter-role conflicts for working mothers (Greenhaus and Beutell, 1985). Particularly for work-oriented mothers with young children, the combination of the role as a caregiver and worker is likely to

result in interfering role demands. By allowing mothers to transfer some of their care responsibilities to a childcare institution, childcare potentially decreases the inter-role conflict, and this might reduce mothers' employment interruptions.

Furthermore, constructivist identity approaches (Stets and Burke, 2000) describe the cultural construction of the ideal mother and worker associated with the individual opportunity structures and family policies (Sjöberg, 2004; Banaszak, 2006). Family policy reforms, such as shorter parental leave periods (Gangl and Ziefle, 2015) and increased availability of low-cost, state-subsidized childcare (Zoch and Schober, 2017), have been found to increase the cultural acceptance of maternal employment. Hence, mothers, who would have wanted to return to employment but felt constraint by traditional gender role ideologies, might be more likely to shorten their employment interruption, particularly in a comparatively traditional context, such as West Germany.

To summarize, both economic and sociological theories assume that the expansion of state-subsidized childcare for under 3-year-olds leads to shorter employment interruptions after childbirth. Based on these theories, we expect mothers to return to employment earlier in counties with more childcare available for under 3-year-olds (H_1).

The economic labour supply theory also allows us to make a clear prediction of when the effect of childcare on mothers' return-to-work decisions is strongest. When paid parental leave entitlements expire in the second year of the child's life, the utility of staying at home declines and a negative income effect can be expected. Thereupon mothers heavily rely on childcare to return to work, which makes childcare availability particularly important. We therefore expect that increased availability of low-cost, state-subsidized childcare does not affect the probability of returning equally but is strongest in the second year after childbirth (H_2).

Increasing childcare availability also allows mothers to work longer hours, as it becomes more accessible for mother to take-up childcare during specific hours, compared to informal caring arrangements, which are only available to few and for a few hours a day. We therefore expect mothers in counties with increased availability of low-cost, state-subsidized childcare to be more likely to work longer hours and, hence, to return to substantial employment, such as full-time or part-time work, compared to mothers living in counties with childcare rationing to return to marginal employment (H_3).

Due to a long history of East-West differences in the take-up of formal childcare and the acceptance of maternal employment, we expect the expansion of childcare availability to have heterogeneous effects on East and West German mothers. In East Germany, using formal childcare

for children more than 1 year has been and still is the dominant social norm, whilst in West Germany, family care still prevails. These differences are also reflected in the more conservative attitudes towards maternal employment and formal childcare in West Germany, compared to East Germany. In 2012, only 13 per cent of East German women agreed with the statement that a child under 6 years is likely to suffer from a working mother compared to 32 per cent of women in West Germany. With respect to childcare, only 17 per cent of East German mothers stated that care for under 6-year-olds should be provided by the family, whereas still 42 per cent of West German mothers agreed with the statement (Schober and Stahl, 2014). We therefore expect the effect of increased availability of low-cost, state-subsidized childcare on maternal employment returns to vary with cultural acceptance of formal childcare and of maternal employment; however, it is difficult to predict a priori for whom the effect will be more pronounced. On the one hand, an increased childcare availability in a region with a high acceptance of maternal employment and formal childcare take-up, such as East Germany, should encourage mothers to further decrease their employment interruptions (H_{4A}). On the other hand, East Germany started expanding childcare at a higher level of availability, and returns to employment among mothers were already relatively fast; hence, there might exist a certain saturation effect with regard to faster returns to employment. Alternatively, increased availability of low-cost, state-subsidized childcare might have a stronger impact on the duration of employment interruptions among mothers in West Germany, where there is greater potential to shorten employment interruptions due to comparatively long interruption durations prior to the childcare expansion (H_{4B}).

5 Research Design

5.1 Data Description

To investigate whether increased availability of low-cost, state-subsidized childcare is associated with shorter employment interruptions among East and West German mothers, we combine annual administrative records on childcare availability on the county-level (*Kreisebene*) from the Federal Statistical Office with individual-level data from the representative German SOEP (Wagner, Frick and Schupp, 2007). We use yearly individual and household information and monthly employment histories on East and West German mothers, with a first, second, or any higher-order birth between January 2006 and December 2014.

Childcare availability is defined as the annual ratio of under 3-year-olds enrolled in subsidized childcare to the population of this age group, including half-day or full-day childcare centres or

childminders.³¹ Combining administrative county-level data with individual longitudinal information provides a unique opportunity to exploit, firstly, temporal variation from the years 2006 to 2014; secondly, regional variation between East and West Germany; and lastly, county-level variation in childcare availability from several counties in East and West Germany.

Figure 2 and Figure 3 depict the gradual increase in low-cost, state-subsidized childcare for under 3-year-olds over time and the variation around the mean in the East and West German counties observed in our sample. We observe mothers in counties, where the average childcare availability for under 3-year-olds increased from 7 to 27 per cent in West Germany and from 40 to 50 per cent in East Germany between 2006 and 2014. For West Germany, county-level childcare availability of more than 20 per cent is only observable after 2009 (see Supplementary Table A3.5). These changes are comparable to official data on the increase in childcare availability in all counties across Germany. In the analysis, we utilize a categorical specification of childcare availability. Beyond this, we test linear, spline, u-shaped as well as different categorical childcare specifications (available on request); however, results presented are based on the most robust categorization.

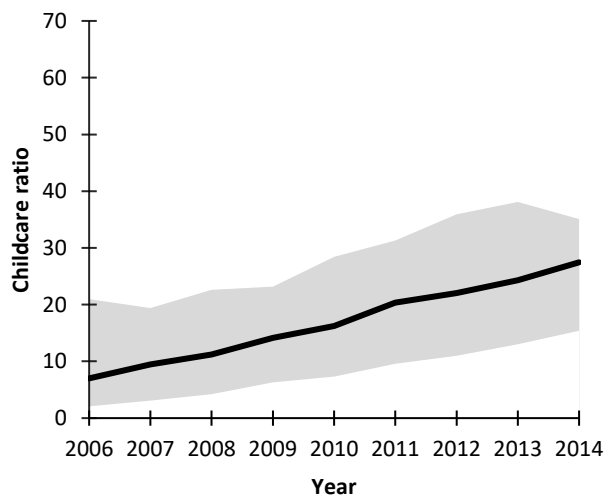


Figure 2 Average state-subsidized childcare availability for under 3-year-olds over time in sample (West)

Source: SOEP v31, linked with regional data at county-level (2006–2014).

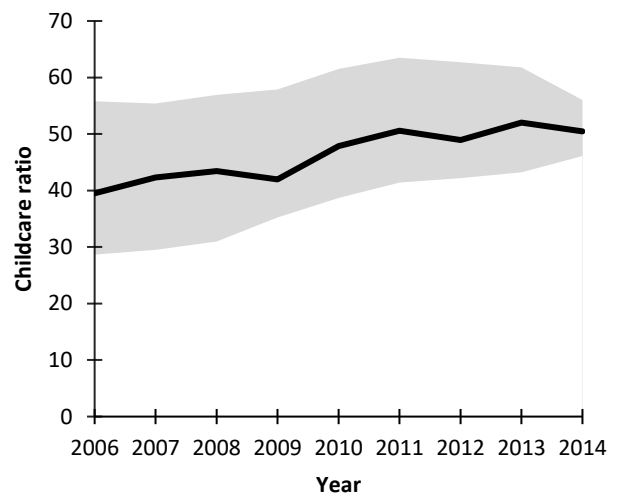


Figure 3 Average state-subsidized childcare availability for under 3-year-olds over time in sample (East)

Source: SOEP v31, linked with regional data at county-level (2006–2014).

³¹ Despite the substantial increase in childcare availability, demand still exceeds the supply in East and West Germany (BMFSFJ, 2015). As this is constantly monitored, the childcare attendance ratio is considered as a measure of supply rather than demand, which is in line with previous studies on Germany (for a detailed description, see Kreyenfeld and Hank, 2000).

5.2 Method of Analysis

To estimate the probability of returning to employment conditional on not having returned to work yet and due to the discrete character of the data, we apply discrete event history analysis (Allison, 1982). More precisely, the piecewise-exponential model allows flexible modelling of the duration dependency of the baseline hazard and is better suited to handle right-censored observations in the data. Due to the relatively small number of events and a peak in the baseline hazard after 12 months (i.e. expiry of benefit payment), 24 months, or 36 months (i.e. expiry of job guarantee), we present models using yearly intervals. However, results are comparable with monthly or half-year intervals.

Our risk set includes all mothers who gave birth, until we observe a return to the labour market (assigning an interruption of 8 weeks to all, whilst employment is legally prohibited), another birth, or the observation is censored. One of the model's assumptions is that the time of censoring is independent of the event. We define our dependent variable as a return to employment whenever the respondent states being part-time, full-time or marginally employed. To take the differing initial availability of state-subsidized childcare into account, we estimate separate models for East and West Germany. In a first step, we estimate the probability of a return to work for all births jointly, which include first, second, and higher-order births (Table 3.3, M1 and M2). In a second step, to identify whether increased childcare availability has had different impacts on a mother's employment interruption after a first or a second birth, we split our samples into returns after a first or a second birth for East and West German mothers, respectively (Table 3.3, M3–M6). Since we observe very few mothers with a higher-order birth, we are unable to analyse these interruptions separately. In a third step, we examine whether increased childcare availability has a more pronounced effect on mothers' return-to-work decisions in the second year after childbirth, when income-related parental leave benefits expire (Figure 4 and Figure 5). In a fourth and final step, we test, using a competing risks model, whether childcare encourages mothers to return to more substantial forms of employment, that is full- or part-time employment, as opposed to marginal employment (Table 3.4).³²

We restrict our sample to mothers who gave birth between 2006 and 2014, as annual official childcare data have only been collected since the start of the childcare expansion in 2006. We exclude women who moved between counties during our observation period to avoid selective moving due to higher childcare availability in some counties, as well as the oversampled

³² Unfortunately, full-time returns are rarely observed, particularly in West Germany. Therefore, we define our dependent variable as a substantial return whenever the respondent states either being employed part-time or full-time.

subsamples such as the high-income sample and migration samples.³³ Following common practice, we right-censor observation periods after 6 years if no return is observed. Similarly, we right-censor spells that end with a birth of another child and instead let another observation period begin.

In total, we observe mothers in 287 of the 402 counties in Germany, 59 of which are located in East Germany. Based on all restrictions, our sample includes 1,016 episodes of 860 West German mothers for whom we observe 553 events. For East Germany, we observe 256 episodes of 219 mothers for whom we observe 166 events. In total, 463 episodes of West German mothers (58 due to another birth) and 90 of East German mothers (12 due to another birth) are right-censored. The most censoring occurred due to missing information, non-response, or a limited observation period (women with a birth at the end of the observation window are more often censored).

5.3 Control Variables

We control for the following relevant time-constant individual characteristics observed for the mother prior to childbirth: age, education and migration background, and time-constant pre-birth employment characteristics, i.e. employment status (full-time, part-time, or not employed) and the pre-birth hourly log wage adjusted for inflation (in 2011 Euros). We also include several time-varying control variables: family status (single, cohabitation, and marriage), number of children in the household, if the child was born after the introduction of the new income-related parental leave benefit scheme in 2007 and log household income adjusted to inflation (in 2011 Euros).

To capture aspects of the regional economic situation that might influence maternal employment participation, we include the centred unemployment rate and female labour force participation rate on the county-level, provided annually by the Federal Statistical Office. In addition, we include the number of marriages per 1,000 adult inhabitants, as a proxy for cultural differences between rural and urban areas and as an indicator for the importance of traditional family norms. To control for further unobserved influences, we included period dummies in all models. Tables 3.1 and 3.2 present the distribution of the control variables for West and East Germany.

³³ We also run estimates across all the SOEP samples. Although results are comparable, we present more conservative estimates based on representative samples.

Table 3.1 Descriptive statistics (West Germany)

West Germany	All births		First births		Second births	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Childcare ratio < 15%	0.41	0.49	0.49	0.50	0.38	0.49
Childcare ratio 15% to < 23%	0.39	0.49	0.33	0.47	0.42	0.49
Childcare ratio ≥ 23%	0.20	0.40	0.19	0.39	0.20	0.40
Individual characteristics						
Mother's age at birth of child	31.62	5.17	30.11	5.56	32.17	4.90
No vocational degree (reference)	0.16	0.36	0.12	0.33	0.11	0.31
Vocational degree	0.59	0.49	0.60	0.49	0.62	0.48
Tertiary degree	0.25	0.44	0.28	0.45	0.27	0.44
Married and cohabiting (reference)	0.82	0.38	0.74	0.44	0.87	0.34
Cohabiting	0.11	0.31	0.16	0.37	0.08	0.27
Single mother	0.07	0.25	0.10	0.29	0.05	0.22
German (reference)	0.69	0.46	0.74	0.44	0.70	0.46
Migration background	0.31	0.46	0.26	0.44	0.30	0.46
Pre-birth employment characteristics						
No employment (reference)	0.52	0.50	0.23	0.42	0.59	0.49
Part-time employment	0.23	0.42	0.10	0.30	0.31	0.46
Full-time employment	0.25	0.43	0.66	0.47	0.10	0.30
Non-missing employment status (reference)	0.91	0.46	0.91	0.29	0.89	0.31
Missing employment status	0.09	0.29	0.09	0.29	0.11	0.31
Log hourly wage before birth (deflated, in €)	3.12	1.18	3.42	0.64	3.16	1.18
Household characteristics						
Number of children	2.03	0.87	1.00	0.00	2.00	0.00
Parental entitlement before 2007 (reference)	0.83	0.38	0.80	0.40	0.82	0.38
Parental entitlement after 2007	0.17	0.38	0.20	0.40	0.18	0.38
Log household income (deflated, in €)	7.17	2.09	6.79	2.47	7.21	2.03
Regional Indicators						
Unemployment rate	6.65	2.97	6.97	3.28	6.42	2.77
Female employment rate	46.93	4.27	46.47	4.46	47.11	4.22
Marriage rate	5.68	1.07	5.57	1.04	5.76	1.01

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

6 Results

Childcare Availability and Interruption Durations

We utilize a categorical specification of childcare availability. For West Germany, we differentiate among availability of less than 15 per cent (reference category), between 15 and 22 per cent, and more than 23 per cent. For East Germany, the categories are less than 42 per cent (reference category), between 42 and 49 per cent, and more than 50 per cent. This categorization allows for an approximately equal distribution of the changing childcare availability over the observation period (see Supplementary A3.5). At the start of the observation period in West Germany, regional availability of low-cost, state-subsidized childcare of less than 15 per cent is most common. Capacities of more than 23 per cent are only available after 2009. For East Germany, increased availabilities also become more common over our observation period.

We present results for East and West German mothers' return-to-work behaviour after any birth in Table 3.3 (M₁ and M₂), reporting average marginal effects (AME). Our results show that increased childcare availability shortens the duration of employment interruptions among West German mothers and increases their probability of returning to employment. In actual terms, this means that when the childcare availability in a West Germany county reaches 15 per cent or more but remains below 23 per cent compared to the reference category, the probability of returning to work increases by 1 percentage point in any month after birth (M₁).

Table 3.2 Descriptive statistics (East Germany)

East Germany	All births		First births		Second births	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Childcare ratio < 42%	0.31	0.46	0.30	0.46	0.30	0.46
Childcare ratio 42% to < 50%	0.35	0.48	0.34	0.48	0.35	0.48
Childcare ratio ≥ 50%	0.34	0.47	0.36	0.48	0.35	0.48
Individual characteristics						
Mother's age at birth of child	30.51	4.90	28.76	4.54	30.73	4.15
No vocational degree (reference)	0.08	0.27	0.07	0.25	0.05	0.21
Vocational degree	0.55	0.50	0.55	0.50	0.58	0.49
Tertiary degree	0.38	0.48	0.39	0.49	0.38	0.49
Married and cohabiting (reference)	0.59	0.49	0.38	0.48	0.69	0.46
Cohabiting	0.28	0.45	0.42	0.49	0.23	0.42
Single mother	0.13	0.33	0.20	0.40	0.09	0.28
German (reference)	0.91	0.29	0.95	0.23	0.92	0.28
Migration background	0.09	0.29	0.05	0.23	0.08	0.28
Pre-birth employment characteristics						
No employment (reference)	0.46	0.50	0.38	0.49	0.41	0.49
Part-time employment	0.20	0.40	0.08	0.28	0.27	0.45
Full-time employment	0.34	0.47	0.53	0.50	0.32	0.47
Non-missing employment status (reference)	0.87	0.33	0.82	0.38	0.95	0.23
Missing employment status	0.13	0.33	0.18	0.38	0.05	0.23
Log hourly wage before birth (deflated, in €)	2.37	1.35	2.68	0.92	2.35	1.46
Household characteristics						
Number of children	1.97	0.87	1.00	0.00	2.00	0.00
Parental entitlement before 2007 (reference)	0.78	0.41	0.72	0.45	0.87	0.33
Parental entitlement after 2007	0.22	0.41	0.28	0.45	0.13	0.33
Log household income (deflated, in €)	6.53	2.54	5.93	2.89	6.76	2.37
Regional Indicators						
Unemployment rate	12.91	3.17	13.59	3.54	12.67	2.77
Female employment rate	51.36	5.10	51.25	5.55	51.18	4.81
Marriage rate	5.14	1.60	5.21	1.82	5.04	1.50

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Similarly, when childcare is available to more than 23 per cent of all under 3-year-old children in a county, the probability of returning to work increases by 2 percentage points in any month after birth (M₁). This implies that substantially greater childcare availability is responsible for faster returns to employment in West Germany. When individual and regional confounders are

included (M₂), the childcare coefficients are reduced, but still statistically significant. Although effect sizes are small, coefficients are generally comparable to individual and household controls (Supplementary Tables A3.6 and A3.7). The effects of these controls are in line with theoretical considerations and do not contradict other related studies. For East Germany, the effect of increased availability of low-cost, state-subsidized childcare is positive but statistically insignificant. Overall, this result provides support for our hypothesis *H1* that an increased childcare availability reduces mothers' employment interruptions following childbirth, but only among West German mothers. Furthermore, although the East German sample is comparatively small, the results provide tentative evidence for our hypothesis *H4B*, which posits a higher potential for West German mothers to shorten their employment interruptions.

Return-to-Work Behaviour after First and Second Childbirth

When turning to the separate estimates for the employment interruption durations after a first or a second birth in Table 3.3 (M₃–M₆), it again becomes evident that considerable childcare ratio of above 23 per cent is particularly important for West German mothers, especially after a second childbirth (M₅ and M₆). For first births, estimates are positive but statistically insignificant once we include individual and regional controls (M₃ and M₄). This may suggest that West German mothers might perceive it as less beneficial to return to employment temporarily before having a second child. Again, for the much smaller sample of East German mothers, we find a positive although statistically insignificant effect.

Time Dependency of Childcare Availability on the Duration of Employment Interruptions

To test, whether the effect of increased childcare availability is similar at each point during the employment interruption (*H2*), we interact the childcare measure with the time periods. We provide a graphical demonstration of our results only (full models are available on request). Figure 4 and 5 illustrate how different levels of childcare availability cause the predicted probability of returning to work to vary in the first year (0–11 months), second year (12–23 months), and beyond the third year (24 months and longer) after childbirth for both West and East German mothers. Including a time-dependent effect of childcare availability in the model indicates that childcare availability of more than 23 per cent increases West German mothers' probability of returning to employment in the second year after childbirth (likelihood ratio test: chi-value 10.61, *P*=0.005), providing support for *H2*. The time-dependency effect is neither statistically significant for the first year after childbirth nor for the third year and beyond (coefficients not shown). Once more, for the smaller sample of East German mothers, we do not find a statistically significant effect.

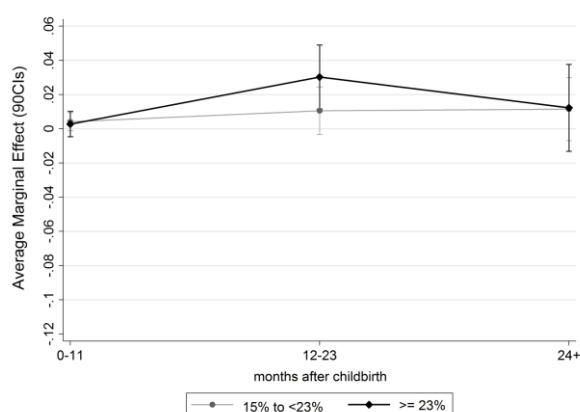


Figure 4 Time-dependency effects for state-subsidized childcare availability (West, all births)

Note: Model includes mother's age and education at birth, mother's employment status and log hourly wage before birth, migration background, marital status, log household income, number of children, year dummies, parental leave period, unemployment rate, female employment rate, and marriage rate.

Source: SOEP v31 linked with regional data on the county-level (2006–2014).

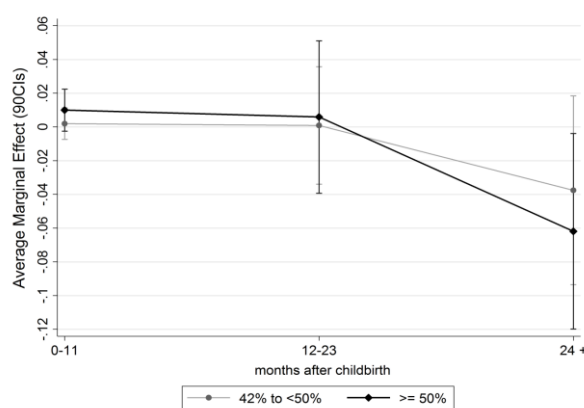


Figure 5 Time-dependency effects for state-subsidized childcare availability (East, all births)

Note: Model includes mother's age and education at birth, mother's employment status and log hourly wage before birth, migration background, marital status, log household income, number of children, year dummies, parental leave period, unemployment rate, female employment rate, and marriage rate.

Source: SOEP v31 linked with regional data on the county-level (2006–2014).

Returns to Substantial versus Marginal Employment

In the final step, we focus on the transition to full- and part-time employment, which we refer to as substantial employment, compared to a transition to marginal employment. Table 3.4 (M1 and M2) shows again a small and positive effect of increased childcare availability on the probability of returning to substantial employment only for West German mothers (full models in Supplementary Tables A3.8 and A3.9). The likelihood to return to marginal employment remains unaltered (M3 and M4). The childcare coefficients are of similar magnitude as in Table 3.3. The finding provides support for our initial assumption (H_3) that increased childcare availability strengthens mothers' labour market attachment, since they return faster and work more hours, particularly for West German mothers.

Sensitivity Checks

We run several sensitivity checks that reinforce our findings. Firstly, we include the child's month of birth in our models to control for increased availability of low-cost, state-subsidized childcare at beginning of the new school year in late August and early September. Secondly, we add different measures of mothers' work commitment to our models to ensure that our results

Table 3.3 Childcare availability and the duration of employment interruptions following childbirth, piecewise-exponential models

West Germany	All births			First births			Second births					
	M1	M2	M3	M4	M5	M6	M1	M2	M3	M4	M5	M6
	AME	SE	AME	SE	AME	SE	AME	SE	AME	SE	AME	SE
Childcare ratio < 15% (ref.)												
Childcare ratio 15% to < 23%	0.009** (0.004)	0.006* (0.003)	0.012* (0.007)	0.011 (0.007)	0.010** (0.005)	0.012* (0.007)	0.011 (0.007)	0.010** (0.005)	0.010** (0.005)	0.010** (0.005)	0.010** (0.005)	0.007 (0.005)
Childcare ratio ≥ 23%	0.017*** (0.006)	0.010** (0.005)	0.016* (0.009)	0.015 (0.010)	0.027*** (0.008)	0.016* (0.009)	0.015 (0.010)	0.027*** (0.008)	0.014** (0.007)	0.014** (0.007)	0.014** (0.007)	0.014** (0.007)
Period dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓	✓					✓
Regional controls		✓		✓		✓	✓					✓
Events	553	553	207	207	207	207	207	254	254	254	254	254
Observations	17,726	17,726	5,374	5,374	5,374	5,374	5,374	7,759	7,759	7,759	7,759	7,759
AIC	4,904.62	4,544.58	1,755.77	1,718.51	1,718.51	1,718.51	1,718.51	2,223.29	2,223.29	2,223.29	2,223.29	2,047.21
BIC	4,982.44	4,746.93	1,821.67	1,883.25	1,883.25	1,883.25	1,883.25	2,292.85	2,292.85	2,292.85	2,292.85	2,221.12
Log Likelihood	-2,442.31	-2,246.29	-867.89	-834.26	-834.26	-834.26	-834.26	-1,101.64	-1,101.64	-1,101.64	-1,101.64	-998.60
East Germany	All births			First births			Second births					
	M1	M2	M3	M4	M5	M6	M1	M2	M3	M4	M5	M6
	AME	SE	AME	SE	AME	SE	AME	SE	AME	SE	AME	SE
Childcare rate < 42% (ref.)												
Childcare rate 42% to < 50%	0.003 (0.007)	-0.000 (0.007)	0.008 (0.014)	0.022 (0.014)	0.005 (0.013)	0.005 (0.012)	0.003 (0.009)	0.000 (0.010)	0.008 (0.014)	0.022 (0.014)	0.005 (0.013)	0.009 (0.012)
Childcare rate ≥ 50%	0.008 (0.009)	0.003 (0.010)	0.000 (0.013)	0.014 (0.018)	0.013 (0.017)	0.013 (0.022)	0.008 (0.009)	0.003 (0.010)	0.000 (0.013)	0.014 (0.018)	0.013 (0.017)	0.020 (0.022)
Period dummies	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individual controls		✓		✓		✓	✓					✓
Regional controls		✓		✓		✓	✓					✓
Events	166	166	59	59	59	59	59	77	77	77	77	77
Observations	4,176	4,176	1,428	1,428	1,428	1,428	1,428	1,710	1,710	1,710	1,710	1,710
AIC	1,387.88	1,348.18	503.31	496.51	496.51	496.51	496.51	625.75	625.75	625.75	625.75	617.83
BIC	1,451.25	1,512.94	555.95	628.11	628.11	628.11	628.11	680.19	680.19	680.19	680.19	753.94
Log Likelihood	-683.94	-648.09	-241.65	-223.25	-223.25	-223.25	-223.25	-302.88	-302.88	-302.88	-302.88	-283.91

Note: Full model includes mother's age and education at birth, mother's employment status and log hourly wage before birth, migration background, marital status, log household income, number of children, year dummies, parental leave period, unemployment rate, female employment rate, and marriage rate.

*p<0.10, **p<0.05, ***p<0.01, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006–2014).

are not driven by women with a stronger work or career orientation returning to work faster. Thirdly, we re-estimated all models, without including the county-level marriage rate per 1,000 adults to assess whether this control variable is driving our results. Fourthly, we exclude births prior to the introduction of the shortened and income-related parental leave in 2007 to examine whether returns to work are driven by the new parental leave scheme. Similarly, we re-estimate all models excluding mothers with a child aged more than 1 year in August 2013 (144 mothers in West and 23 mothers in East Germany), to ensure that results were not driven by the introduction of the legal entitlement to a childcare place. In the same vein, we exclude the three states from our analysis that implemented a legal entitlement to childcare prior to 2013 (Rhineland Palatinate, Thuringia, and Saxony Anhalt). Finally, we test for the possibility of selective panel attrition. However, all sensitivity analyses show similar patterns and therefore confirm our previous findings (available on request).

Table 3.4 Childcare rate and the duration of employment interruptions following childbirth, competing risks model

West Germany	Substantial return				Substantial return			
	M1		M2		M3		M4	
	AME	SE	AME	SE	AME	SE	AME	SE
Childcare ratio < 15% (reference)								
Childcare ratio 15% to < 23%	0.008***	(0.003)	0.006**	(0.003)	0.000	(0.002)	0.000	(0.002)
Childcare ratio ≥ 23%	0.016***	(0.004)	0.008**	(0.004)	0.002	(0.003)	0.002	(0.003)
Period dummies	✓		✓		✓		✓	
Individual controls			✓				✓	
Regional controls			✓				✓	
Events	368		368		185		185	
Observations	17,070		17,070		16,881		16,881	
AIC	3,562.24		3,230.23		1,997.47		1,918.62	
BIC	3,639.69		3,431.61		2,074.81		2,119.70	
Log Likelihood	-1,771.12		-1,589.12		-988.74		-933.31	
East Germany	Substantial return				Marginal return			
	M1		M2		M3		M4	
	AME	SE	AME	SE	AME	SE	AME	SE
Childcare rate < 42% (reference)								
Childcare rate 42% to < 50%	0.006	(0.007)	0.003	(0.006)	-0.001	(0.004)	-0.004	(0.005)
Childcare rate ≥ 50%	0.011	(0.008)	0.007	(0.010)	-0.002	(0.004)	-0.006	(0.005)
Period dummies	✓		✓		✓		✓	
Individual controls			✓				✓	
Regional controls			✓				✓	
Events	139		139		27		27	
Observations	4,013		4,013		3,898		3,898	
AIC	1,218.88		1,169.94		2,98.60		3,16.42	
BIC	1,281.85		1,333.67		361.29		479.39	
Log Likelihood	-599.44		-558.97		-139.30		-132.21	

Note: Full model includes mother's age and education at birth, mother's employment status and log hourly wage before birth, migration background, marital status, log household income, number of children, year dummies, parental leave period, unemployment rate, female employment rate, and marriage rate.

*P<0.10, **P<0.05, ***P<0.01, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006–2014).

7 Summary and Conclusion

Focusing on a major public childcare expansion in Germany, this study provides first evidence that an increased availability of low-cost, state-subsidized childcare for under 3-year-olds shortens mothers' employment interruptions after childbirth. By exploiting exogenous temporal and regional variation in county-level childcare availability in East and West Germany, we find that increased availability of low-cost, state-subsidized childcare significantly shortens employment interruptions among West German mothers. As the pre-reform availability and acceptance of formal childcare and maternal employment were low and interruption durations were comparatively long, West German mothers had a significant potential to shorten their interruption duration. For the much smaller East German sample, we find a positive but statistically insignificant effect. The findings for East and West German mothers suggest that an expansion of low-cost, state-subsidized childcare is more likely to significantly reduce the interruption duration after childbirth in a relatively traditional context with previously exceptionally low childcare availability. In contrast, due to the already comparatively short interruptions prior to the expansion, the potential for even shorter interruptions may have been limited among East German mothers. Hence, our results lend support to previous studies, which find a small or no employment effect of state-subsidized childcare expansions when pre-reform childcare availability is comparatively well developed (Brilli, Del Boca and Pronzato, 2016; Havnes and Mogstad, 2011; Lundin, Mörk and Öckert, 2008). However, it is important to keep in mind that we base these findings on a relatively small sample of East German mothers.

Beyond this, our findings suggest that the effect of increased availability of low-cost, state-subsidized childcare may be particularly pronounced for interruptions following a second birth. This might suggest that increased childcare availability does not significantly alter mothers' return-to-work behaviour if they still plan to have more children. Previous research supports this argument, showing that West German mothers have a tight spacing of 2–4 years between a first and second child (Kreyenfeld, 2008). It seems plausible that West German mothers, who plan to have a second child, perceive it as difficult to find short-term care arrangements for their first child and expect employers to be averse to a temporary return to employment. Hence, they may perceive a temporary return to work as less beneficial than a single but longer employment interruption. Therefore, formal childcare may become particularly important for faster labour market returns after family planning is likely to have been completed.

Furthermore, in line with previous research (Haan and Wrohlich, 2011; Geyer, Haan and Wrohlich, 2015), our results provide additional support that increased availability of low-cost,

state-subsidized childcare increases mothers' likelihood of returning to employment in the second year after childbirth when paid leave entitlements expire and childcare becomes important. The design of the parental leave scheme can serve as an additional explanation for why increased childcare availability may increase the likelihood of returning to employment in the second year particularly among West German mothers, compared to East German mothers. The nature of the paid parental leave entitlement does not make it necessarily beneficial to have interruption durations below 12 months and to return to work whilst still entitled to paid leave, as paid leave entitlements are reduced by labour income. This finding provides tentative evidence that the effect of increased availability of low-cost, state-subsidized childcare depends on other family policies, in particular the income-related parental leave entitlement. Future research should evaluate how childcare availability interacts with other policies, which for example foster the male-breadwinner model and whether heterogeneous policy effects exist among various social groups and labour market contexts.

Finally, our findings suggest that increased availability of low-cost, state-subsidized childcare plays a significant role in supporting mothers' returns to substantial employment (again only statistically significant for West German mothers), whereas the effect of childcare availability on returns to marginal employment remains unaltered. Differentiating between mothers with different employment histories and investigating whether more full-time childcare slots will lead to more full-time employment, particularly in West Germany, should be examined in further research.

A major limitation of our study is the small sample sizes, especially for East Germany, which did not allow for further subsample analyses. By exploiting temporal and regional variation in county-level childcare availability and a wide range of individual-, household-, and county-level controls, we try to account for unobserved heterogeneity. Yet, the risk of biased estimates remains due to other unobserved characteristics, such as formal childcare quality, which may correlate with the childcare expansion and maternal employment. Despite these limitations, our findings align with previous studies highlighting the importance of formal childcare for maternal employment (Morrissey, 2017 for an overview) and provide additional evidence of how family policy reforms, in our case the increased county-level availability of low-cost, state-subsidized childcare, significantly encourage reductions in employment interruptions and enable mothers to return to more substantial employment (part-time or full-time). In the future, research may observe a larger impact on maternal employment, as full-time childcare slots are increasingly becoming available due to the legal entitlement to childcare. From a general perspective, our findings emphasize that an institutional change, which strengthens the dual-earner model, profoundly impacts on mothers' employment trajectories.

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Appendix

Table A3.5 Distribution of childcare availability over the observation period

	Year of observation									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
West Germany										
Childcare ratio < 15%	97.27	89.79	80.07	65.09	42.28	20.01	14.02	4.87	0.00	100.00
Childcare ratio 15% to < 23%	2.73	10.21	19.93	31.45	45.94	56.93	50.03	47.10	16.38	100.00
Childcare ratio ≥ 23%	0.00	0.00	0.00	3.46	11.78	23.07	35.94	48.02	83.62	100.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
East Germany										
Childcare ratio < 42%	67.42	44.05	41.77	53.00	40.39	8.60	2.33	0.00	0.00	100.00
Childcare ratio 42% to < 50%	21.12	40.08	40.53	21.66	27.72	42.83	40.31	46.93	41.67	100.00
Childcare ratio ≥ 50%	11.46	15.87	17.70	23.35	31.89	48.57	57.36	53.07	58.33	100.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Table A3.6 Childcare rate and the duration of employment interruptions, full piecewise-exponential models (West Germany)

	All births			First births			Second births			
	M1			M2			M3			
	AME	SE	CI	AME	SE	CI	AME	SE	CI	
0-11 months (reference)										
12-23 months	0.032**	(0.005)	[0.023, 0.041]	0.034**	(0.009)	[0.015, 0.053]	0.037**	(0.007)	[0.022, 0.051]	
24- months or longer	0.041**	(0.007)	[0.028, 0.054]	0.055**	(0.016)	[0.024, 0.085]	0.036**	(0.010)	[0.017, 0.055]	
Childcare ratio < 15% (reference)										
Childcare ratio 15% to < 23%	0.006+	(0.003)	[-0.000, 0.013]	0.011	(0.007)	[-0.003, 0.024]	0.007	(0.005)	[-0.002, 0.017]	
Childcare ratio ≥ 23%	0.010*	(0.005)	[0.000, 0.020]	0.015	(0.010)	[-0.005, 0.035]	0.014*	(0.007)	[0.000, 0.029]	
Number of children	-0.001	(0.002)	[-0.005, 0.003]							
Mother's age at birth of child	-0.000	(0.000)	[-0.001, 0.000]	-0.000	(0.001)	[-0.002, 0.001]	-0.000	(0.000)	[-0.001, 0.001]	
No vocational degree (reference)										
Vocational degree	0.008*	(0.004)	[0.000, 0.016]	-0.001	(0.011)	[-0.022, 0.021]	0.015**	(0.005)	[0.005, 0.025]	
Tertiary degree	0.019**	(0.005)	[0.009, 0.030]	0.008	(0.014)	[-0.018, 0.035]	0.029**	(0.007)	[0.016, 0.042]	
No employment (reference.)										
Part-time employment	0.026**	(0.004)	[0.018, 0.034]	0.022*	(0.011)	[0.001, 0.043]	0.027**	(0.007)	[0.013, 0.041]	
Full-time employment	0.027**	(0.005)	[0.017, 0.036]	0.032**	(0.009)	[0.015, 0.049]	0.029**	(0.010)	[0.008, 0.049]	
Missing employment status (ref.: non-missing)	0.013*	(0.006)	[0.000, 0.026]	0.028+	(0.016)	[-0.003, 0.060]	0.009	(0.010)	[-0.011, 0.029]	
Log hourly wage	0.002	(0.002)	[-0.001, 0.005]	0.002	(0.006)	[-0.011, 0.014]	-0.000	(0.002)	[-0.004, 0.004]	
Log household income	-0.007**	(0.001)	[-0.008, -0.006]	-0.006**	(0.001)	[-0.008, -0.004]	-0.008**	(0.001)	[-0.010, -0.006]	
Married and cohabiting (reference)										
Cohabiting	-0.005	(0.003)	[-0.012, 0.001]	-0.002	(0.006)	[-0.013, 0.009]	-0.009	(0.006)	[-0.021, 0.002]	
Single mother	-0.001	(0.006)	[-0.012, 0.010]	0.003	(0.009)	[-0.014, 0.020]	-0.013	(0.009)	[-0.030, 0.005]	
Migration background (reference: German)	-0.013**	(0.003)	[-0.019, -0.007]	-0.017**	(0.006)	[-0.029, -0.004]	-0.008	(0.005)	[-0.017, 0.002]	
Parental leave reform 2007 (reference: 2006)	-0.001	(0.006)	[-0.013, 0.011]	-0.014	(0.011)	[-0.036, 0.008]	0.010	(0.009)	[-0.007, 0.028]	
Unemployment rate	-0.000	(0.001)	[-0.001, 0.001]	0.000	(0.001)	[-0.002, 0.003]	0.000	(0.001)	[-0.002, 0.002]	
Female employment rate	-0.000	(0.001)	[-0.001, 0.001]	0.000	(0.001)	[-0.002, 0.002]	-0.000	(0.001)	[-0.002, 0.001]	
Marriage rate	0.002	(0.001)	[-0.000, 0.005]	0.005+	(0.003)	[-0.001, 0.010]	0.000	(0.002)	[-0.003, 0.004]	
Events	553			207			254			
Observations	17726			5374			7759			
AIC	4544.58			1718.51			2047.21			
BIC	4746.93			1883.25			2221.12			
Log Likelihood	-2246.29			-834.26			-998.60			

Note: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Table A3.7 Childcare rate and the duration of employment interruptions, full piecewise-exponential models (East Germany)

	All births			First births			Second births		
	M1			M2			M3		
	AME	SE	CI	AME	SE	CI	AME	SE	CI
0-11 months (reference)									
12-23 months	0.046**	(0.013)	[0.020, 0.074]	0.058*	(0.023)	[0.012, 0.103]	0.061**	(0.022)	[0.017, 0.105]
24- months or longer	0.075**	(0.020)	[0.036, 0.113]	0.106**	(0.030)	[0.047, 0.165]	0.093*	(0.038)	[0.017, 0.168]
Childcare ratio < 42% (reference)									
Childcare ratio 42% to < 50%	-0.000	(0.007)	[-0.013, 0.013]	0.022	(0.014)	[-0.007, 0.050]	0.009	(0.012)	[-0.015, 0.032]
Childcare ratio ≥ 50%	0.003	(0.010)	[-0.017, 0.023]	0.014	(0.018)	[-0.022, 0.050]	0.020	(0.022)	[-0.022, 0.062]
Number of children	-0.005	(0.004)	[-0.014, 0.003]						
Mother's age at birth of child	0.001	(0.001)	[-0.001, 0.003]	0.002	(0.001)	[-0.001, 0.004]	0.000	(0.002)	[-0.003, 0.004]
No vocational degree (reference)									
Vocational degree	0.007	(0.014)	[-0.020, 0.034]	0.005	(0.017)	[-0.029, 0.038]	-0.054	(0.038)	[-0.129, 0.021]
Tertiary degree	0.016	(0.014)	[-0.011, 0.043]	0.052*	(0.024)	[0.004, 0.100]	-0.056	(0.035)	[-0.125, 0.012]
No employment (reference)									
Part-time employment	0.027**	(0.010)	[0.007, 0.047]	0.031+	(0.019)	[-0.005, 0.068]	0.045*	(0.021)	[0.004, 0.085]
Full-time employment	0.021*	(0.011)	[0.000, 0.042]	0.006	(0.016)	[-0.024, 0.037]	0.036+	(0.019)	[-0.000, 0.072]
Missing employment status (reference: non-missing)	-0.022+	(0.012)	[-0.046, 0.002]	-0.041	(0.026)	[-0.093, 0.011]	0.005	(0.027)	[-0.048, 0.058]
Log hourly wage	0.008**	(0.003)	[0.003, 0.014]	0.007	(0.007)	[-0.006, 0.020]	0.011*	(0.005)	[0.002, 0.020]
Log household income	-0.003+	(0.002)	[-0.006, 0.000]	-0.004	(0.003)	[-0.009, 0.001]	-0.002	(0.003)	[-0.008, 0.005]
Married and cohabiting (reference)									
Cohabiting	0.021**	(0.008)	[0.005, 0.037]	0.027	(0.018)	[-0.008, 0.061]	0.018+	(0.010)	[-0.001, 0.037]
Single mother	-0.016*	(0.007)	[-0.029, -0.003]	-0.022+	(0.013)	[-0.047, 0.004]	-0.023	(0.016)	[-0.054, 0.009]
Migration background (reference: German)	0.008	(0.008)	[-0.008, 0.024]	0.033*	(0.014)	[0.004, 0.061]	0.024	(0.021)	[-0.018, 0.066]
Parental leave reform 2007 (reference: 2006)	0.017+	(0.010)	[-0.003, 0.037]	0.012	(0.020)	[-0.027, 0.052]	0.049**	(0.018)	[0.014, 0.084]
Unemployment rate	-0.000	(0.002)	[-0.003, 0.003]	-0.001	(0.003)	[-0.008, 0.005]	-0.003	(0.003)	[-0.008, 0.002]
Female employment rate	-0.000	(0.001)	[-0.002, 0.002]	-0.001	(0.002)	[-0.005, 0.003]	0.000	(0.002)	[-0.004, 0.004]
Marriage rate	0.003	(0.002)	[-0.001, 0.006]	0.005	(0.003)	[-0.001, 0.012]	0.003	(0.003)	[-0.003, 0.009]
Events	166			59			77		
Observations	4,176			1,428			1,710		
AIC	1,348.18			496.51			617.83		
BIC	1,512.94			628.11			753.94		
Log Likelihood	-648.09			-223.25			-283.91		

Note: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Table A3.8 Competing risks model, full models (West Germany)

	Substantial return			Marginal return		
	AME	SE	CI	AME	SE	CI
West Germany						
0-11 months (reference)						
12-23 months	0.023**	(0.004)	[0.014, 0.031]	0.011**	(0.003)	[0.006, 0.017]
24 months or longer	0.033**	(0.007)	[0.020, 0.046]	0.012**	(0.004)	[0.005, 0.020]
Childcare ratio < 15% (reference)						
Childcare ratio 15% to < 23%	0.006*	(0.003)	[0.000, 0.011]	0.000	(0.002)	[-0.004, 0.005]
Childcare ratio ≥ 23%	0.008*	(0.004)	[0.000, 0.016]	0.002	(0.003)	[-0.004, 0.009]
Number of children	-0.002	(0.002)	[-0.006, 0.001]	0.001	(0.001)	[-0.001, 0.003]
Mother's age at birth of child	0.000	(0.000)	[-0.000, 0.001]	-0.001**	(0.000)	[-0.001, -0.000]
No vocational degree (reference)						
Vocational degree	0.006+	(0.003)	[-0.000, 0.013]	0.003	(0.002)	[-0.002, 0.008]
Tertiary degree	0.020**	(0.005)	[0.010, 0.029]	0.000	(0.003)	[-0.005, 0.006]
No employment (reference)						
Part-time employment	0.022**	(0.004)	[0.015, 0.030]	0.007*	(0.003)	[0.001, 0.014]
Full-time employment	0.025**	(0.004)	[0.017, 0.033]	0.003	(0.003)	[-0.003, 0.009]
Missing employment status (reference: non-missing)	0.015*	(0.006)	[0.003, 0.027]	0.002	(0.004)	[-0.006, 0.010]
Log hourly wage	0.002	(0.002)	[-0.001, 0.005]	0.000	(0.001)	[-0.001, 0.002]
Log household income	-0.005**	(0.001)	[-0.006, -0.004]	-0.003**	(0.000)	[-0.003, -0.002]
Married and cohabiting (reference)						
Cohabiting	0.001	(0.003)	[-0.005, 0.007]	-0.006**	(0.002)	[-0.010, -0.003]
Single mother	0.005	(0.006)	[-0.007, 0.017]	-0.005	(0.003)	[-0.010, 0.001]
Migration background (reference: German)	-0.008**	(0.003)	[-0.014, -0.003]	-0.005*	(0.002)	[-0.009, -0.001]
Parental leave reform 2007 (reference: 2006)	-0.003	(0.005)	[-0.014, 0.008]	0.000	(0.004)	[-0.008, 0.008]
Unemployment rate	0.000	(0.001)	[-0.001, 0.001]	-0.000	(0.000)	[-0.001, 0.000]
Female employment rate	-0.000	(0.000)	[-0.001, 0.001]	0.000	(0.000)	[-0.001, 0.001]
Marriage rate	0.002	(0.001)	[-0.001, 0.004]	0.000	(0.001)	[-0.001, 0.002]
Events		368			185	
Observations		17,070			16,881	
AIC		3,230.23			1,918.62	
BIC		3,431.61			2,119.70	
Log Likelihood		-1589.12			-933.31	

Note: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Table A3.9 Competing risks model, full models (East Germany)

	Substantial return			Marginal return		
	AME	SE	CI	AME	SE	CI
0-11 months (reference)						
12-23 months	0.042**	(0.013)	[0.016, 0.067]	0.006*	(0.003)	[0.000, 0.011]
24- months or longer	0.052**	(0.019)	[0.015, 0.090]	0.021*	(0.008)	[0.005, 0.038]
Childcare ratio < 42% (reference)						
Childcare ratio 42% to < 50%	0.003	(0.006)	[-0.009, 0.015]	-0.004	(0.005)	[-0.013, 0.006]
Childcare ratio ≥ 50%	0.007	(0.010)	[-0.012, 0.027]	-0.006	(0.005)	[-0.017, 0.004]
Number of children	-0.006	(0.004)	[-0.015, 0.002]	0.000	(0.001)	[-0.002, 0.002]
Mother's age at birth of child	0.001	(0.001)	[-0.001, 0.002]	0.000	(0.000)	[-0.000, 0.001]
No vocational degree (reference)						
Vocational degree	0.023*	(0.009)	[0.005, 0.042]	-0.018	(0.017)	[-0.051, 0.014]
Tertiary degree	0.027**	(0.008)	[0.012, 0.042]	-0.015	(0.018)	[-0.049, 0.020]
No employment (reference)						
Part-time employment	0.037**	(0.012)	[0.014, 0.061]	-0.006	(0.005)	[-0.015, 0.004]
Full-time employment	0.023*	(0.011)	[0.001, 0.045]	-0.002	(0.006)	[-0.013, 0.009]
Missing employment status (reference: non-missing)	-0.016	(0.014)	[-0.043, 0.012]	-0.003	(0.006)	[-0.015, 0.009]
Log hourly wage	0.008*	(0.004)	[0.001, 0.015]	0.001	(0.003)	[-0.004, 0.006]
Log household income	-0.003+	(0.002)	[-0.006, 0.000]	-0.000	(0.001)	[-0.002, 0.001]
Married and cohabiting (reference)						
Cohabiting	0.018*	(0.007)	[0.004, 0.033]	0.002	(0.004)	[-0.006, 0.011]
Single mother	-0.013+	(0.008)	[-0.029, 0.002]	0.002	(0.004)	[-0.006, 0.010]
Migration background (reference: German)	0.006	(0.011)	[-0.016, 0.028]	0.003	(0.008)	[-0.013, 0.019]
Parental leave reform 2007 (reference: 2006)	0.013	(0.012)	[-0.011, 0.038]	0.000	(0.007)	[-0.013, 0.014]
Unemployment rate	-0.002	(0.001)	[-0.004, 0.001]	0.002*	(0.001)	[0.000, 0.003]
Female employment rate	-0.001	(0.001)	[-0.002, 0.001]	0.000	(0.000)	[-0.001, 0.001]
Marriage rate	0.004+	(0.002)	[-0.000, 0.007]	0.000	(0.001)	[-0.002, 0.002]
Events	139				27	
Observations	4,013				3,898	
AIC	1,169.94				316.42	
BIC	1,333.67				479.39	
Log Likelihood	-558.97				-132.21	

Note: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, robust standard errors in parentheses.

Source: SOEP v31 linked with regional data on the county-level (2006-2014).

Chapter 4 Mothers' Labour Supply and Public Childcare Provision in East and West Germany: Do all Mothers Profit from higher Coverage (2007 – 2015)? *

Abstract

By focusing on a period of a major public childcare expansion in Germany, this study investigates whether higher levels of childcare coverage for under-threes have been positively associated with employment among mothers with different socioeconomic backgrounds. Both standard economic labour theories and sociological identity and gender construction theories presume that the effect of public childcare provision varies with mothers' socioeconomic backgrounds. This analysis links county-level data on annual childcare ratios with individual-level data of the Socio-Economic Panel Study (2006-2015). To match mothers with similar characteristics in counties with childcare ratios above and below the annual median within East and West Germany, entropy balancing is applied. Findings indicate a positive association between childcare provision and maternal employment, particularly in West Germany. Additionally, results were stronger for part-time employment and after second births, whereas full-time employment was limited to mothers with medium and high education levels in East and West Germany, respectively.

Keywords: childcare, educational inequality, family policy, Germany, maternal employment, matching, socioeconomic background

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1 Introduction

Germany is well known for its considerable low maternal employment rate, long childbirth related employment interruptions and high part-time rates, particularly in West Germany (Hook, 2015; Rosenfeld, Trappe and Gornick, 2004). From a life course perspective, this has a considerable impact not only in the short term but also on mothers' future economic positions. Not only do longer employment interruptions and the predominance of part time employment among mothers lead to a loss in current income, they also tend to place women on a permanently lower career and income trajectory, resulting in wage and pension inequalities compared to men and childless women (Steiber and Haas, 2012).

Thus, in line with other European member states, Germany has implemented a major expansion of public childcare services for under-three-year-olds to enable the reconciliation between family and work and, thus, to increase the maternal labour supply. Economic and sociological theories as well as a considerable literature on childcare and maternal employment presume the impact of increased public childcare provision on maternal employment participation to be positive. Recent trends in childcare take-up, however, show increasing socioeconomic disparities in East and West Germany (Stahl and Schober, 2017).

This study contributes to the literature on the effects of public childcare services on maternal employment by focusing on a major public childcare expansion in East and West Germany. It investigates whether higher levels of low-cost, state-subsidised childcare for under-threes are associated with a higher employment probability and more weekly working hours for mothers with different educational levels and with a first or second birth. By focusing on East and West Germany, the study investigates how the relationship between public childcare and maternal employment varies in two contexts that differ markedly in their initial childcare coverage rates and the acceptance of non-parental care and maternal employment.

2 Childcare Provision and Maternal Employment in East and West Germany

Persistent East-West differences in maternal employment and work-care norms have frequently been explained as resulting from different family policies before the German reunification. Long parental leave periods and a lack in childcare services for under-three-year-olds have long reinforced the model of the (*modified*) *male breadwinner* with a female carer or part-time carer (Hook, 2015; Rosenfeld, Trappe and Gornick, 2004). Although in East Germany the almost universal provision of childcare services was reduced after 1990, higher levels of childcare coverage, much of which is full-time, have enabled shorter interruption durations and returns to long part- or full-time employment (Rosenfeld, Trappe and Gornick, 2004). In sum, long parental leave

entitlements and worsening labour market opportunities for mothers with lower education levels seemed to have increased educational disparities in maternal employment up to the mid 2000s (Drasch, 2013), with full-time employment being more widespread only among mothers with higher education levels (Konietzka and Kreyenfeld, 2010). In 2007, a shortened, income-related parental leave was introduced to increase employment, particularly among low-income families. Leave benefits consist of 65 per cent of net earnings for a maximum of 12 months as well as two additional months, reserved for each parent. However, employed parents are still entitled to three-years of job protected leave.

To enable mothers to reconcile work and family, in 2005 the German government decided to increase state-subsidised, childcare provision for under-threes and implemented a legal entitlement for all children aged one year or older from August 2013. Although the childcare expansion is financially supported by the federal government, it is planned and implemented by the German federal states and county-level authorities so there is a considerable variation in the degree to which childcare services have increased from year to year across Germany. The annual and regional variation in childcare coverage levels is significantly related to different counties' productivity and political priorities (Andronescu and Carnes, 2015).

Thus far, the expansion has increased childcare attendance rates tremendously, albeit starting from different levels in East and West Germany. In 2006 almost all East German counties provided childcare to more than 30 per cent of all under-threes, whereas West German counties seldom reached more than 20 per cent (Federal Statistical Office, 2007). Between 2006 and 2015, coverage rates increased from 8 to 28 percent in West Germany and from 40 to 52 percent in East Germany (Federal Statistical Office, 2016). However, these averages mask great regional variation in the increase of childcare services. In 2015 average provision ranged from 44 to 63 per cent in East Germany and from 13 to 47 per cent in West Germany. Moreover, full-time coverage still varies tremendously, as in East Germany more than 40 per cent of all children aged under three attend childcare more than 7 hours a day, compared to only 13 per cent in West Germany (Federal Statistical Office, 2016).

While childcare provision has increased, recent research shows rising socioeconomic differences in childcare take-up. Although counties and federal states cover the largest share of costs of childcare coverage (about 47 and 31 per cent respectively), and hence parental fees (on average about 14 per cent) are often income dependent and well below the OECD average (Schober and Spieß, 2015), parents' childcare expenditures have increased, particularly for households with higher incomes (Schmitz, Spieß and Stahl, 2017). Nevertheless, it is mothers with middle

and high levels of education in particular, who are more likely to take up formal childcare compared to mothers with low education levels, single mothers, or parents with a migration background (Schober and Stahl, 2014). The increasing socioeconomic differences in childcare take-up suggest that the association between childcare provision and maternal employment is also highly likely to vary with mothers' socioeconomic background.

Although between 2006 and 2016 employment rates among mothers with under-threes have increased considerably from 43 to 53 per cent in West- and from 47 to 65 per cent in East Germany (Federal Statistical Office, 2017), the question remains of whether all mothers profit from higher levels of childcare coverage. In this study, the time and county-level variation in childcare provision within East and West Germany is exploited to investigate the relationship between childcare coverage and employment behaviour among mothers with different educational backgrounds and a first or second child.

3 Previous Research

By exploiting regional and time variation in childcare provision for under-threes, most international studies have hinted at the importance of public, or publicly subsidised, childcare for maternal employment (see Morrissey, 2017 for an overview). Some studies suggest that increased childcare coverage has greater effects on maternal employment in contexts where childcare was severely rationed before (Brilli, Del Boca and Pronzato, 2016 on Italy; Havnes and Mogstad, 2011 on Norway). Several studies, investigating employment according to mothers' socioeconomic backgrounds, show stronger effects for mothers with high opportunity costs of non-employment, such as single mothers or mothers from low-income families (see Morrissey, 2017, for an overview). These international studies, however, focus on increased childcare coverage primarily in contexts where childcare services are dominated by for-profit providers. Their findings may therefore not be applicable to the German context of *optional familialism* (Hook, 2015), where an income related parental leave benefit and public childcare services increasingly support the dual-earner dual-carer model, and simultaneously older policies such as joint taxation and family health insurance simultaneously reinforce the traditional male breadwinner model.

So far, a few quasi-experimental studies provide evidence for a positive effect of increased childcare coverage in Germany, with particularly pronounced effects among mothers with children aged two to three (Geyer, Haan and Wrohlich, 2015) and mothers with low or medium incomes (Haan and Wrohlich, 2011; Bonin *et al.*, 2013). Furthermore, higher levels of childcare coverage seem to be associated with shorter employment interruption durations among West German mothers with a second birth (Zoch and Hondralis, 2017). Conversely, Schober and Spieß

(2015) do not find full-time childcare coverage rates to affect maternal employment once they control for childcare quality, particularly for East Germany. These studies, however, were unable to further investigate whether the association between higher levels of childcare coverage and maternal employment varies by mothers' education levels and their first or second birth.

For the period 2007 to 2013, recent research shows growing educational disparities in maternal employment and childcare take-up in East and West Germany as compared to earlier periods, with a more pronounced increase in employment among mothers with at least vocational qualifications (Stahl and Schober, 2017). At the same time, exclusive parental care increased especially for mothers with low education levels, which is explained by their consistently lower employment prospects, particularly in East Germany (id.). This longitudinal study, however, was unable to consider more control variables to account for different labour market opportunities and mothers' work experience before childbirth and to differentiate between part-time and full-time employment and first or second births.

With the growing differential in mothers' childcare take-up and the strong relationship between childcare choice and maternal employment, it seems plausible that the recent childcare expansion is also associated with strong social inequalities in maternal employment. By focusing on the period of increased childcare provision, this study investigates whether higher levels of childcare coverage for under-threes have been positively associated with employment among mothers with different socioeconomic backgrounds. It exploits time and county-level variation in the speed at which public childcare has expanded in both East and West Germany and adds to the literature by investigating the association among mothers with different levels of educational attainment and first or second births. Thereby, this study distinguishes between full-time and part-time employment and analyses whether employment is more pronounced for higher levels of full-time childcare coverage. To account for the long-standing and persistent East-West differences in childcare provision, work-care norms and employment opportunities, the study analyses the relationship between childcare and maternal employment separately in East and West Germany.

4 Theoretical Framework

Both economic and sociological theories presume public childcare provision to impact positively on maternal employment. According to the rational choice perspective in economic theories, public childcare reduces the opportunity costs of non-employment, and thus increases maternal employment (Becker, 2009; Mincer and Polachek, 1974). Consequently, economic theory predicts that mothers with high opportunity costs of non-employment, such as highly paid mothers,

mothers with an only child, or those with low family income will increase their labour supply most when public childcare becomes widely available. Beyond this, mothers might also increase their labour supply based on the expectation that employers consider marginal or part-time employment after childbirth as a signal of low productivity and reduced work commitment and, thus return to employment in order to signal their commitment to the employer (Spence, 1973).

However, with comparatively low and income-dependent childcare fees as in Germany, rational choice and cost-benefit explanation might not be sufficient to explain potential socio-economic differences in maternal employment. Sociological theories, including identity constructivist approaches and role theory (Stets and Burke, 2000), have highlighted the importance of the individual opportunity structures and family policies for the construction of mothers' identities and persistent work-care norms, and thus mothers' chosen work-care arrangements. Previous research shows that less traditional work-care attitudes are significantly correlated with mothers' employment (Steiber and Haas, 2012). Additionally, there is growing evidence that family policies fostering maternal employment are associated with less traditional ideologies towards maternal employment (Gangl and Ziefle, 2015; Zoch and Schober, 2017). Hence, mothers' are likely to adopt their preferences for work-care arrangements, and thus increase their labour supply when public childcare becomes widely available, particularly in a previously comparatively traditional context, such as West Germany.

Additionally, previous research has provided evidence for more egalitarian work-care norms, and thus higher employment rates among highly educated mothers (Steiber and Haas, 2012). For Germany, however, it is argued that educational differences in maternal employment have been less visible, as even mothers with high levels of educational attainment faced barriers to employment due to the exceptionally low childcare coverage, particularly in West Germany. With increased provision, educational disparities are likely to rise as individual work-care choices can be more easily aligned with individual preferences (Hook, 2015).

To summarise, both economic and sociological theories presume that the higher the level of childcare coverage for under-threes, particularly if full-time, the more likely mothers are to work (*H1a*) and to work longer hours (*H1b*). Additionally, both theoretical frameworks suggest that the association between childcare provision and maternal employment is highly likely to vary with mothers' opportunity costs and therefore socioeconomic backgrounds. Hence, the second general hypothesis presumes that mothers with higher opportunity costs of non-employment, such as highly educated mothers or mothers with an only child are more likely to work (*H2a*) or work longer hours (*H2b*) compared to mothers with lower opportunity costs, when levels of childcare coverage for under-threes are high and particularly if full-time.

Considering the previously higher childcare coverage rates and maternal employment, as well as less traditional work-care norms in East Germany (Rosenfeld, Trappe and Gornick, 2004; Schober and Stahl, 2014), the association between childcare and maternal employment is likely to vary among mothers in East and West Germany. However, it is difficult to predict a priori for which context the association will be more pronounced when focusing on the period of childcare expansion. On the one hand, previous studies, as well as theoretical considerations, predict a stronger link between increased childcare services and maternal employment in contexts, with exceptionally low childcare coverage prior to the start of an expansion, such as in West Germany. On the other hand, in East Germany, less traditional work-care norms and higher levels of full-time childcare provision are assumed to positively impact on maternal employment. Hence, higher levels of childcare coverage might be particularly associated with long part-time and full-time work and educational disparities may be less distinct. Conversely, in West Germany, where work-care norms are traditional, and although childcare provision has increased considerably, full-time childcare services continue to be scarce. Hence, higher levels of childcare coverage are likely to be linked to part-time rather than full-time employment, whereas full-time employment might be exclusively limited to highly educated mothers. The analysis will empirically determine whether the relationship between childcare provision and maternal employment is stronger in East or West Germany, and whether it is more pronounced among certain subgroups.

5 Data and Estimation Strategy

The analysis combines annual administrative records at county-level (*Kreisebene*) childcare coverage from the Federal Statistical Office with individual-level data from the representative German Socio-Economic Panel between 2006 and 2015 (SOEP) (Wagner, Frick and Schupp, 2007). The sample includes mothers aged 18 to 47 with a first or second child under three. Mothers, who move between counties during the observation period and mothers without any work experience are excluded. In total, mothers in 348 of the 402 counties in Germany are observed, 71 of which are located in East Germany. The final sample for West Germany consists of 4,144 observations of 1,796 mothers with 959 first and 1,149 second births. For East Germany, 1,249 observations of 538 mothers with 284 first and 346 second births are observed. 297 West German and 82 East German mothers are observed with a first and second birth.

5.1 Estimation Strategy

To investigate the association between childcare provision and maternal employment, the analysis seeks to compare the employment behaviour of mothers in counties with higher or lower

levels of childcare. However, previous research demonstrates that childcare take-up is not random, but is correlated with individual and household characteristics (Stahl and Schober, 2017). Additionally, there remains a risk that mothers from counties with higher or lower childcare provision differ significantly in their individual and household characteristics, as the variation in the increase of childcare services across Germany is associated with county characteristics such as employment rates and productivity (Andronescu and Carnes, 2015). Although conventional regression models perform even if treatment and control groups differ in their covariate distribution, effect estimates are likely to be biased, particularly when the estimation relies heavily on extrapolation (Stuart, 2010). Hence, this study applied a control-group design together with a matching technique in order to ensure that the estimated coefficients for mothers with higher levels of childcare coverage rely on a control group of mothers with comparable individual and county-level characteristics.

To form a reasonable treatment and control group, the study exploits the annual county-level childcare attendance ratios to distinguish mothers in counties with a childcare ratio above the annual region-specific median (treatment group) from those where county-level childcare ratio fell below the median (control group) in East and West Germany, respectively. To balance the covariate distribution of both groups of mothers in East and West Germany, and thus to identify the most similar control group, the non-parametric matching technique of entropy balancing (EB) (Hainmueller, 2012) was applied. While conventional matching techniques achieve a balanced covariate distribution only indirectly and thus often fail to achieve an exact matching of all pre-specified moments and for all covariates (Caliendo and Kopeinig, 2008), EB calculates weights directly in order to achieve a balanced covariate distribution in both groups. Therefore, mothers in the control group with lower childcare coverage levels, who are more similar to mothers in the treatment group, received higher weights, so that both groups of mothers obtained the same covariate distribution for all included conditioning variables. As cases of statistically similar pairs of mothers where the county-level childcare ratio is above and below the annual median cannot only be matched or discarded but receive weights that vary smoothly, EB makes use of all available cases. This way, mothers from different childcare contexts with nearly identical individual characteristics and county-level contexts, e.g., labour market conditions and settlement structure at the county-level, were compared.

To implement entropy balancing, firstly, the weights for the group of mothers with below-median childcare coverage were obtained by applying the user written command *ebalance* separately for the East and West German subsamples. By estimating ordinary least square and logistic regression, binary and continuous dependent variables on maternal employment were regressed on a dummy that indicated an annual childcare ratio above the median and the sampling

weights obtained in the first step, were included.³⁴ In addition, to adjust the standard error of the estimated effect and to reduce the unexplained variance in maternal employment, all conditioning variables added in the first step were included in the regression models (Marcus, 2014).

To investigate the association between childcare and employment among mothers with a first and second birth, entropy balancing was separately implemented within both subsamples of East and West German mothers. Furthermore, separate models were estimated for East and West German mothers with a university or college degree, vocational training and mothers with low levels of education, differentiating again also by first and second births. Lastly, I investigated whether the association between childcare and full-time employment was stronger for the availability of full-time than provision that included both full and part time places.

5.2 Maternal Employment and Childcare Availability

The analyses used three binary outcome variables, indicating whether a mother works (>0 weekly hours), is employed part-time (15 to 35 weekly hours) or full-time (35 weekly hours or more). In addition, a fourth outcome indicated the number of actual weekly working hours.

The key independent variable distinguished counties with a childcare ratio above and below the annual median within East and West Germany. The childcare ratio was defined as the annual share of under-threes, enrolled in any form of subsidised childcare services, including half-day or full-day childcare centres or child-minders.³⁵ In addition, all models were re-estimated by using full-time childcare coverage rates, that is childcare places available for more than 7 hours a day. Among the observed sample of East and West German mothers, childcare coverage increased gradually over time, which is in line with official statistics on the childcare expansion (Federal Statistical Office, 2016) (see Figure A4.1 and A4.2 in the Appendix).

5.3 Conditioning Variables

The SOEP provides a rich set of individual, household and county-level control variables that affect the probability of maternal employment and childcare take-up. All models included mothers' age, migration background and education, distinguishing between a college or university degree (high), vocational training (medium) and less than vocational training (low). To control

³⁴ Estimating county-level fixed-effects models using a linear or categorical childcare measure did not reveal a significant relationship for East or West Germany. This is probably because of the comparatively small within-variation in annual childcare coverage over time.

³⁵ Although childcare coverage increased tremendously, parental demand still exceeds the supply in East and West Germany, which is constantly monitored (BMFSFJ 2015). Hence, childcare attendance ratios are considered as a measure of supply rather than demand, which is in line with all previous studies on Germany.

for prenatal employment characteristics, mothers' employment status were controlled, distinguishing between full-time, part-time, unemployment and a residual category for missing information. Additionally, pre-birth indicators for inflation-adjusted income (in 2011 Euros), the cumulated full-time and part-time work experience in years and a variable indicating the perceived importance of having career success were included to further control for mothers' work orientation before birth. On the household level the number of children and the current equivalised net household income (in 2011 Euros) were controlled for. A categorical variable indicated the youngest child's age, distinguishing between children younger than one, two and three and a dummy, indicating whether the child was born before the parental leave reform in 2007.

The estimator assumes that no unobserved variables exist that simultaneously influence individual changes in maternal employment and public childcare provision, i.e., that maternal employment generally follows the same trend in the two groups of mothers. To account for county-level variation in labour markets and productivity, which is most likely to affect the expansion in childcare services and maternal employment simultaneously, all models include the following county-level controls, provided annually by the Federal Statistical Office: unemployment rate, GDP per capita, a dummy indicating rural counties and the number of public servants per 1000 inhabitants. To address concerns about reverse causality between greater childcare coverage and maternal employment participation, lagged variables of the county-level indicators are used. To account for further unobserved influences, all models include period dummies.

Table A4.4 in the appendix presents summary statistics of selected conditioning variables for mothers with a county-level childcare ratio above and below the annual median in East and West Germany. In West Germany, mothers with access to above-median childcare provision are, for example, significantly more likely to have high levels of education or a higher individual and household income and to live in urban areas with more favourable economic and labour market characteristics. In contrast, East German mothers with above-median childcare provision are significantly more likely to live in rural counties and have a higher employment rate and lower GDP per capita. After the reweighting based on entropy balancing, for each conditioning variable the mean is identical in the two groups of mothers within East and West Germany and the estimated standardised bias is below the recommended level of 5 per cent (Caliendo and Kopeinig, 2008).

6 Findings

Table A4.5 in the appendix shows summary statistics on all dependent variables for East and West German mothers by mothers' education levels and birth in counties with childcare ratios

above or below the annual median. For most subgroups in East and West Germany, average employment participation, as well as average weekly working hours, were higher among mothers with access to higher levels of childcare. Differences between the two groups were statistically significant among most educational groups of West German mothers, whereas in East Germany differences were less obvious.

Table 4.1 shows the results of the final models for East and West Germany, applying entropy balancing. All models included the full set of conditioning variables, period dummies and county-level clustered standard errors. As coefficients of the control variables are not interpretable after balancing, only the childcare estimates are presented. For the logistic regressions average marginal effects are reported. Among West German mothers with a first or second child, above-median childcare provision, provided as full-time or part-time places, was significantly associated with higher employment likelihood and a higher number of average weekly working hours (M₁). Mothers in counties with above-median childcare provision were 7 percentage points more likely to work, and worked about 3 hours more per week compared to mothers in counties with below-median childcare provision. These results seem to be driven by a strong, positive and statistically significant association between childcare and part-time employment, whereas the link with full-time employment was less pronounced, but still statistically significant. Differentiating between mothers with a first (M₂) or second birth (M₃) revealed a statistically significant and strong association between childcare and part-time employment only for

Table 4.1 Average marginal effects of above-median childcare availability on maternal employment

	West Germany			East Germany		
	All births	1 st birth	2 nd birth	All births	1 st birth	2 nd birth
	M1	M2	M3	M1	M2	M3
Work	0.07** (0.03)	0.07** (0.03)	0.03 (0.03)	0.01 (0.03)	-0.01 (0.04)	0.03 (0.04)
Part Time	0.07** (0.02)	0.09** (0.03)	0.03 (0.03)	-0.02 (0.03)	-0.09 (0.06)	-0.00 (0.04)
Full Time	0.03* (0.01)	0.03 (0.02)	0.04** (0.01)	0.01 (0.02)	0.05 (0.04)	0.02 (0.04)
Working Hours	2.98** (0.76)	3.51** (0.87)	1.92* (0.96)	0.06 (1.18)	0.20 (1.42)	0.61 (1.43)
N	4144	1843	2301	1249	562	687
N treated	2091	909	1182	547	266	281
Counties	277	249	248	71	62	67

Notes: Robust standard errors clustered at county-level in parentheses.

+ p<0.1, * p<0.05, ** p<0.01

Source: SOEP v31 linked with county-level data (2007-2015).

first births, whereas the results for full-time employment were smaller in magnitude and only significant for second births. The association between childcare and average hours worked was statistically significant for both births, but larger in magnitude for mothers with an only child.

For the much smaller sample of East German mothers, the employment differences between mothers with childcare provision above or below the median childcare ratio seem to be less distinct, mostly rather small in magnitude and statistically insignificant (M₁ – M₃). If at all, childcare seems to be positively associated with full-time employment, whereas the relationship with part-time employment appears to be negative.

Table 4.2 shows the results of above-median childcare provision on maternal employment according to mothers' education levels and birth in East or West Germany. Among West German mothers with a college or university degree (M₁-M₃), results confirmed the positive and significant association of childcare with part-time employment after a first birth (M₂), and with full-time employment after a second birth (M₃). The relationship with weekly working hours, however, seemed to be stronger for second births. For mothers with vocational training (M₄-M₆) and mothers with no- or less than a vocational degree (M₇-M₉), above-median childcare was significantly associated only with part-time employment, particularly after second births (M₆ and M₉). Moreover, for mothers with low education levels, the results were also statistically significant after a first birth (M₆), however, only with respect to overall employment participation. Coefficients for working hours were larger among mothers with low education levels, but were statistically significant for most samples of mothers. However, due to the rather small number of counties with above-median childcare provision, results should be interpreted with caution, particularly with respect to mothers with low educational levels. For East German mothers, differentiating by education revealed again negative, but statistically insignificant, associations among mothers with high and medium levels of education, particularly for part-time employment.³⁶ For both subsamples, results on full-time employment were positive though insignificant for first births and among mothers with vocational training above-median childcare was significantly associated with employment for second births.

Table 4.3 shows the results for the regressions of maternal full-time employment and weekly working hours on above-median childcare with full time places only. For West Germany, esti-

³⁶ For the very small sub-sample of East German mothers with no or less than a vocational degree effects cannot be estimated separately, however, joint models with medium educated do not show any statistically significant effects.

Table 4.2 Average marginal effects of above-median childcare availability on maternal employment by level of education

	West Germany						East Germany								
	High			Medium			Low ¹			High			Medium		
	All births	2 nd birth	1 st birth	All births	2 nd birth	1 st birth	All births	2 nd birth	1 st birth	All births	2 nd Birth	1 st birth	All births	1 st birth	2 nd birth
Work	M1	M3	M2	M4	M5	M6	M7	M8	M9	M1	M3	M2	M4	M5	M6
	0.09* (0.04)	0.09* (0.04)	0.02 (0.05)	0.05 (0.03)	0.06+ (0.03)	0.03 (0.03)	0.14* (0.04)	0.13* (0.06)	0.13* (0.07)	-0.03 (0.04)	-0.05 (0.06)	-0.00 (0.08)	0.03 (0.04)	-0.05 (0.05)	0.08* (0.04)
Part-time	0.07* (0.03)	0.00 (0.04)	0.10* (0.05)	0.07* (0.03)	0.01 (0.03)	0.08** (0.03)	0.12** (0.04)	0.11 (0.09)	0.14 (0.11)	-0.08+ (0.04)	-0.09 (0.06)	-0.07 (0.04)	-0.01 (0.04)	-0.05 (0.06)	0.06 (0.03)
Full-time	0.06** (0.02)	0.07* (0.03)	0.02 (0.03)	-0.00 (0.01)	0.01 (0.02)	0.00 (0.01)	0.09 (0.08)	-	-	0.03 (0.05)	-0.06 (0.06)	0.02 (0.05)	0.04 (0.04)	0.01 (0.05)	-0.03 (0.04)
Hours	3.59** (1.32)	3.31+ (1.97)	0.60 (1.86)	1.66* (0.81)	1.82* (0.84)	1.74+ (0.91)	4.10* (1.98)	4.13* (1.73)	3.55+ (1.93)	-1.27 (1.94)	-1.43 (2.12)	-2.42 (1.94)	0.65 (1.51)	-0.89 (2.21)	1.13 (1.59)
N	1272	697	575	2505	1081	1424	367	187	180	477	267	210	696	317	379
N treated	796	429	367	1126	462	664	169	80	89	189	100	89	320	153	167
Counties	176	144	131	252	211	214	120	83	75	50	44	42	68	52	60

Notes: Robust standard errors clustered at county-level in parentheses. + p<0.1, * p<0.05, ** p<0.01, ¹Too few observations to distinguish between first and second births among mothers with lower educational levels.

Source: SOEP v31 linked with county-level data (2007-2015).

mates were again particularly significant after second births (M_3). Similarly, when differentiating between mothers' education levels, for mothers with a vocational degree (C) results revealed a positive link between full-time childcare and maternal employment only after second birth (M_2). Among highly educated mothers (B), however, results on full-time employment were statistically significant for both births (M_1 - M_3), yet estimates remained insignificant and very small in magnitude for weekly working hours. For mothers with low education levels (D), results revealed a surprising negative relationship, with comparatively large coefficients for weekly working hours. However, again findings are based on a very small number of counties.

For East German mothers, results on the relationship between full-time childcare provision and employment were less ambiguous than in the previous models, as the findings showed a positive association for full-time work, particularly after a second birth (M_3). However, among mothers with vocational training (C), estimates on full-time employment were also significant and large in magnitude for first births (M_2).

Overall, for West Germany results were in line with Hypotheses 1, assuming a positive association between childcare and mothers' employment probability ($H1a$) and average weekly working hours ($H1b$). However, for East Germany results only partially support the Hypotheses, revealing significant links with employment only for full-time childcare.

Distinguishing births and mothers' education levels provided mixed evidence for Hypotheses 2, which presumed a stronger association between childcare and employment ($H2a$) as well as weekly working hours ($H2b$) for mothers with higher opportunity costs of non-employment, such as mothers with high education levels or an only child. For West Germany, results on full-time employment among highly educated mothers, as well as on part-time employment among mothers without a college degree were in line with Hypothesis H_2 . In East Germany, however, the stronger full-time employment associations among mothers with medium levels of education along with the somehow negative associations among highly educated mothers, contradicted Hypotheses H_2 . Similarly, for East and West Germany the significant associations, particularly after second births contradict theoretical considerations for stronger effects among first births due to smaller opportunity costs of non-employment compared to mothers after a second birth.

Overall, the results indicate that above-median childcare provision is positively associated with maternal employment participation and mothers' weekly working hours, particularly in West Germany. Effect sizes are modest, ranging mostly between 10 and 50 per cent of a standard deviation, and correspond to the magnitude of regional-level indicators for childcare coverage in previous studies (Morrissey, 2017).

Table 4.3 Average marginal effects of above-median full-time childcare availability on maternal employment

	West Germany			East Germany		
	all	Births 1 st	2 nd	all	Births 1 st	2 nd
	M1	M2	M3	M1	M2	M3
A: All mothers						
Full-time	0.01 (0.01)	-0.01 (0.02)	0.03* (0.02)	0.07** (0.02)	0.05 (0.04)	0.09** (0.03)
Actual Hours	1.13 (0.87)	0.75 (1.09)	3.88** (0.88)	1.45 (0.96)	0.80 (1.64)	2.33+ (1.26)
N	4135	1834	2301	1245	559	686
N treated	2041	906	1135	597	281	316
Counties	278	250	248	71	61	67
B: High Education						
Full-time	0.11** (0.03)	0.16** (0.04)	0.08** (0.03)	0.01 (0.04)	-0.05 (0.04)	0.07* (0.03)
Actual Hours	1.12 (1.18)	0.49 (1.18)	0.86 (1.58)	-0.24 (1.68)	0.46 (2.32)	-0.61 (1.70)
N	1275	577	698	477	209	268
N treated	772	364	408	244	107	137
Counties	175	131	144	49	41	43
C: Medium Education						
Full-time	0.02 (0.01)	-0.05 (0.03)	0.03* (0.01)	0.09** (0.03)	0.14** (0.04)	0.11** (0.04)
Actual Hours	3.06** (0.65)	2.01 (1.56)	3.56** (0.71)	2.30 (1.67)	1.81 (2.01)	6.50** (1.96)
N	2494	1070	1424	693	316	377
N treated	1089	455	634	328	161	167
Counties	253	212	213	67	52	59
D: Low Education						
Full-time	-0.06* (0.02)	- ¹	- ¹			
Actual Hours	-6.12* (2.92)	-5.97* (2.73)	-6.93 (6.38)			
N	366	187	179			
N treated	180	87	93			
Counties	117	82	73			

Notes: Robust standard errors clustered at county-level in parentheses. + p<0.1, * p<0.05, ** p<0.01, ¹To few observations to distinguish between first and second births among mothers with lower educational levels.

Source: SOEP v31 linked with county-level data (2007-2015).

Sensitivity checks

To ensure that the chosen upper and lower limits, defining part-time and full-time employment, do not drive the presented results, all models are re-estimated with different class limits for part-

time and full-time employment (part-time as 15-32 or 15-36 hours). To examine whether the results are driven by women entitled to the shortened and income related parental leave benefit, introduced in 2007, births before January 2007 are excluded. Similarly, all models are re-estimated excluding mothers with a child aged older than one year in August 2013, to ensure that results are not driven exclusively by the introduction of the legal entitlement to a childcare place. Furthermore, additional conditioning variables are tested, including a dummy, indicating current pregnancy and annual average weekly working hours for women in East and West Germany. All sensitivity analyses, however, show similar patterns and therefore confirm the above findings (available on request). Additionally, models are estimated analysing the effect of above-median childcare provision for under-threes on mothers with a youngest child aged between three and six. The results show no effect on maternal employment and, hence, ensure that no general trend in maternal employment is driving the presented effects (available on request).

7 Summary and Discussion

Focusing on a period of a major public childcare expansion in Germany, this study provides evidence that higher levels of childcare for the under-threes have been positively associated with maternal employment participation and mothers' weekly working hours, particularly in West Germany. For West Germany, the positive relationship between above median childcare-provision and maternal employment seem to be driven by part-time employment and by mothers with a second birth, particularly among mothers with medium and high levels of education. Conversely, the link with full-time employment seemed to be limited to highly educated mothers, who are usually assumed to have higher opportunity costs of non-employment as well as less traditional work-care norms. For the much smaller sample of East German mothers, the results provided tentative evidence that higher levels of childcare coverage are positively associated with less part-time but more full-time employment, particularly among mothers with medium education levels.

For West Germany, with respect to the increasing trend in childcare-take up, the educational disparities in the results are in line with previous studies that find positive impacts especially among mothers with at least a vocational degree (Stahl and Schober, 2017). The positive although mostly statistically insignificant results among mothers with low education levels in West Germany thus indicate that those mothers who, compared to highly educated mothers, so far adhered to more traditional work-care norms (Schober and Stahl, 2014) and showed a comparatively weaker attachment to the labour market (Drasch, 2013; Konietzka & Kreyenfeld, 2010) continue to work predominantly in marginal- or part-time employment, despite childcare provision

having increased tremendously. Furthermore, the results demonstrate the importance of full-time childcare provision for full-time employment. Nevertheless, results on full-time employment are only significant for mothers with higher educational attainment and mothers with medium education levels and a second birth. This might hint at the persistent importance of more traditional work-care norms among mothers with low education levels in West Germany.

With respect to educational disparities in East Germany, the negative employment effects for highly educated mothers come as somewhat of a surprise, contradicting previous family policy evaluations. The results might provide tentative evidence that highly educated East German mothers may be either restricted by regional labour market patterns, or that the importance of full-time employment has further declined, as for highly educated mothers the persistently lower job prospects in the East German labour market might have reduced mothers' career ambitions. Additionally, an increasingly critical perception of the quality of childcare provision might have impacted negatively on maternal employment and reduced the cultural acceptance of childcare services for very young children, particularly among highly educated mothers. This would be in line with recent findings, showing a significantly negative association between childcare services with larger group sizes and maternal employment participation only for mothers in East Germany (Schober and Spieß, 2015).

The particularly pronounced results for mothers with a second child suggest that childcare provision might not significantly alter mothers' employment behaviour if they still plan to have more children, particularly in West Germany. This is supported by previous research, which has provided evidence for a more pronounced and persistent two-child norm (Diabaté and Ruckdeschel, 2017) and a tight spacing of two to four years between a first and second child (Kreyenfeld, 2008) among West German mothers. As mothers might expect employers to be averse to a temporary return to employment they may perceive this as less beneficial than a single but longer employment interruption. Consequently, childcare is likely to become particularly important only after family planning is complete. This is also in line with more recent research that shows higher levels of childcare coverage to be positively associated with shorter employment interruption durations predominantly among West German mothers with a second birth (Zoch and Hondralis, 2017). Considering full-time childcare provision, the results provide additional support for the stronger association between childcare and maternal employment after second birth, as, with the exception of highly educated mothers, for most mothers, full-time childcare coverage tends to become important only after a second birth.

Overall, the findings indicate that above-median childcare provision is significantly associated with maternal employment, particularly for West Germany. Hence, the results may provide tentative evidence that the positive association is linked to childcare expansion and due to

the previously exceptionally low levels of employment and childcare take-up among mothers with a child under three.

Finally, some important limitations need to be considered. Small sample sizes, particularly for East German mothers, did not allow for further subsample analysis, and finding for subgroups of mothers, particularly for first and second births among the different educational groups, are based on a very small number of districts counties with above-median childcare provision. Hence, the results should be interpreted with caution. By exploiting variation in county-level childcare coverage and a wide range of individual, household and county-level conditioning variables, the study tries to account for unobserved heterogeneity. Yet, the risk of a bias remains due to other unobserved characteristics, such as individual work-care norms, partners' involvement in domestic work or formal childcare quality, which may correlate with the childcare expansion, childcare take-up and maternal employment.

Despite these important limitations, the findings align with previous studies highlighting the importance of public childcare provision for maternal employment, particularly in regions with previously low levels of childcare coverage. The study finds that above-median childcare provision seems to be of particular importance to mothers with high and medium levels of education and after second births. In addition, the study emphasises the importance of full-time childcare provision for full-time employment in both East and West Germany and, thereby, points to important educational disparities in maternal employment. Thus, the study extends previous research that often failed to distinguish between the provisions of childcare in general, and full-time childcare in particular, as well as differentiating between mothers with different educational backgrounds and between first and second births. As this is one of the first studies investigating the association between higher levels of childcare coverage and maternal employment since the start of the childcare expansion in Germany, future research should look more into direct, as well as indirect mechanisms, such as important thresholds of childcare provision, as well as the interplay of childcare services with family planning and other policies such as parental leave benefits or childcare provision for older children, to identify and further explain socioeconomic differences in maternal employment.

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Appendix

Table A4-4 Summary statistics for selected conditioning variables before and after matching (first and second births combined)

Variable	West Germany				East Germany				
	Mean		Standard. bias (%)		Mean		Standard. Bias (%)		
	Above-median childcare	Below-median childcare	unmatched	matched	unmatched	matched	unmatched	matched	
<i>Individual-Level Characteristics</i>									
Mother's age	33.46	32.99	33.46	0.0	32.00	32.01	32.00	-0.2	0.0
Medium education	0.54	0.65	0.54	0.0	0.59	0.60	0.58	-2.0	0.0
High education	0.38	0.24	0.38	0.0	0.35	0.34	0.35	2.1	0.0
Migration background	0.35	0.29	0.35	0.0	0.07	0.08	0.07	-3.8	0.0
Partnered cohabiting	0.10	0.14	0.10	0.0	0.32	0.29	0.32	6.5	0.0
Single	0.05	0.05	0.05	0.0	0.15	0.14	0.15	2.9	0.0
Importance of job	1.01	1.30	1.01	0.0	1.15	1.19	1.15	-3.8	0.0
Importance of job (m)	0.54	0.40	0.54	0.0	0.42	0.37	0.42	10.2	0.0
Income prenatal	21.90	21.52	21.90	0.0	15.52	13.64	15.52	12.4	0.0
Income prenatal (m)	0.38	0.36	0.38	0.0	0.30	0.28	0.30	4.3	0.0
Household-income	1398.00	1258.00	1398.00	0.0	984.50	984.90	984.40	-0.1	0.0
Youngest child's age 1-2	0.31	0.33	0.31	0.0	0.30	0.32	0.30	-4.3	0.0
Youngest child's age 2-3	0.41	0.40	0.41	0.0	0.42	0.41	0.42	2.0	0.0
2 children	0.57	0.49	0.57	0.0	0.51	0.47	0.51	8.0	0.0
Part-time prenatal	0.18	0.19	0.18	0.0	0.13	0.10	0.13	9.4	0.0
Full-time prenatal	0.26	0.23	0.26	0.0	0.33	0.36	0.33	-6.3	0.0
Employment prenatal (m)	0.33	0.27	0.33	0.0	0.20	0.19	0.20	2.5	0.0
Employment experience	0.34	0.35	0.34	0.0	0.34	0.33	0.34	10.0	0.0
Experience missing	0.05	0.03	0.05	0.0	0.05	0.03	0.05	10.0	0.0
Parental leave prior 2007	0.13	0.33	0.13	0.0	0.22	0.26	0.22	-7.1	0.0
<i>County-level characteristics</i>									
Unemployment rate	6.58	6.88	6.58	0.0	13.15	12.82	13.15	10.7	0.0
GDP per Capita	40.88	29.31	40.88	0.0	22.60	25.68	22.60	-55.1	0.0
Rural County	0.23	0.35	0.23	0.0	0.76	0.37	0.76	84.8	0.0
N	2091	2053	4144		547	702	1249		
Counties	136	141	277		47	24	71		

Note: Bold figures indicate significant mean differences between mothers with above and below-median childcare before matching (t-test). Source: SOEP v31 (2007-2015).

Table A4.5 Summary statistics for maternal employment

	Above-median childcare				Below-median childcare			
	All mothers	High Education	Medium Education	Low Education	All mothers	High Education	Medium Education	Low Education
West Germany								
1st and 2nd births								
Work	0.47	0.51	0.45	0.39	0.42	0.47	0.43	0.21
Part-Time	0.26	0.29	0.25	0.15	0.19	0.24	0.19	0.04
Full-Time	0.10	0.15	0.07	0.07	0.08	0.12	0.07	0.04
Hours	11.29	13.88	9.86	8.26	8.76	11.34	8.52	4.05
N	1888	728	1018	142	1933	446	1309	178
1st births								
Work	0.50	0.52	0.49	0.40	0.41	0.45	0.43	0.22
Part-Time	0.27	0.29	0.28	0.16	0.19	0.21	0.20	0.04
Full-Time	0.12	0.16	0.09	0.09	0.11	0.16	0.10	0.07
Hours	12.27	14.36	11.20	8.52	9.87	12.54	9.85	4.74
N	811	335	406	70	853	185	576	92
2nd births								
Work	0.44	0.50	0.42	0.39	0.42	0.48	0.42	0.21
Part-Time	0.25	0.28	0.24	0.15	0.19	0.26	0.18	0.03
Full-Time	0.09	0.15	0.06	0.06	0.05	0.08	0.05	0.02
Hours	10.55	13.48	8.98	8.01	7.88	10.55	7.47	3.31
N	1077	393	612	72	1080	261	733	86
East Germany								
1st and 2nd births								
Work	0.51	0.58	0.50	0.25	0.52	0.60	0.47	0.38
Part-Time	0.19	0.20	0.20	0.04	0.26	0.27	0.25	0.31
Full-Time	0.30	0.36	0.28	0.17	0.23	0.32	0.18	0.04
Hours	17.97	21.29	16.85	8.29	16.89	21.17	14.23	9.46
N	477	167	286	24	625	257	342	26
1st births								
Work	0.53	0.63	0.49	0.36	0.58	0.60	0.57	0.43
Part-Time	0.16	0.16	0.16	0.07	0.26	0.25	0.27	0.43
Full-Time	0.38	0.47	0.33	0.29	0.29	0.36	0.25	0.00
Hours	19.66	24.52	17.39	13.50	19.46	22.77	17.72	10.14
N	230	81	135	14	262	101	154	7
2nd births								
Work	0.50	0.53	0.50	0.10	0.48	0.60	0.39	0.37
Part-Time	0.22	0.23	0.23	0.00	0.25	0.28	0.23	0.26
Full-Time	0.23	0.26	0.24	0.00	0.19	0.30	0.12	0.05
Hours	16.40	18.26	16.36	1.00	15.02	20.13	11.37	9.21
N	247	86	151	10	363	156	188	19

Source: SOEP v31 (2007-2015).

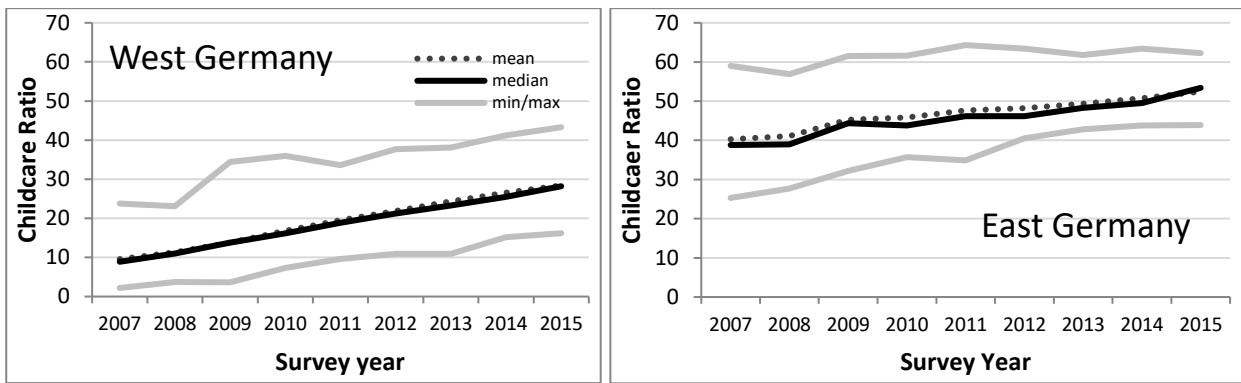


Figure A4.1 Childcare attendance ratios for under-three-year-olds (in %)

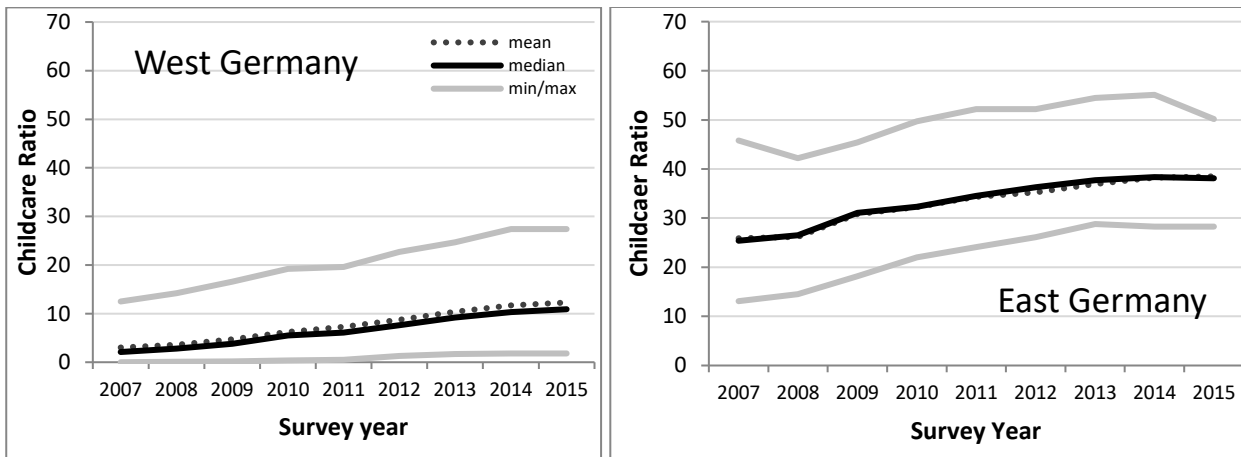


Figure A4.2 Full-time childcare attendance ratios for under-three-year-olds (in %)

Chapter 5 Summary, Concluding Discussion and Outlook

By focusing on a period of major increase in childcare provision in Germany, this thesis investigates whether the provision of childcare services for under-threes is positively associated with maternal employment and a change in individual gender ideology among parents with young children. While the studies have been presented in detail in the previous chapters, this chapter aims at briefly summarising their contribution and addresses limitations and open questions that might provide promising terrain for future research.

1 Summary and Limitations of the three Studies

The three individual studies have analysed whether the increase of public childcare provision in East and West Germany has been positively associated with firstly, short-term change in individual-level gender ideologies among parents with young children and secondly, employment participation amongst mothers of under-threes. More precisely, two studies have investigated whether public childcare provision is positively related to shorter employment interruptions and whether the association between childcare and maternal part-time or full-time employment varies according to first and second births, mothers' educational attainment, and whether full-time childcare is available or provision that includes both full and part time places. By linking rich individual- and household-level data from panel surveys with annual administrative childcare records at the county-level, the three studies apply a micro-macro approach in order to disentangle compositional differences at the individual-level and childcare policy variations at the macro level. Thus, the three studies aim at explaining the relationship between childcare provision and maternal employment as well as the formation of gender ideologies more thoroughly than many previous single country or comparative studies.

In sum, the analyses indicate that public childcare provision was positively associated with a change in gender ideologies, as well as shorter employment interruptions and a higher likelihood of employment participation and more working hours among mothers, particularly in West Germany. With respect to gender ideologies, the findings show that the childcare expansion has been associated with moderate changes towards less traditional gender ideologies only among mothers in West Germany, and mostly among mothers without a college degree. Surprisingly, in East Germany, the results revealed tentative evidence of more traditional gender ideologies among mothers without a college degree as the childcare reform unfolded. However,

from a broader view the results provide evidence that policy reforms may also alter gender ideologies in the short-term.

Considering return-to-work-behaviour, the analyses indicate that higher levels of childcare coverage were associated with shorter employment interruptions, mostly among West German mothers. For those mothers, results showed a higher likelihood of returning to more substantial employment, particularly after second birth and in the second year after childbirth, when paid leave entitlements expire and the availability of childcare becomes important. However, while the presented results point generally to more profound associations between higher levels of childcare provision and shorter employment interruptions among West German mothers, other model specification that included half-yearly time periods pointed to the relevance of increased childcare provision for shorter interruption durations, not only for mothers in West Germany, but also for those in East Germany. Although the estimates for higher levels of childcare provision remained insignificant for the overall sample of East German mothers, statistically significant interactions between the childcare measure and the half-yearly time periods also point to shorter interruption periods for this group. Including a time dependent effect of childcare provision indicated that higher levels of childcare coverage increase East German mothers' probability of returning to employment by the end of the first year after childbirth, independently of the number of the birth. In contrast, pronounced increases were only detected in the second year after the birth of a second child among West German mothers, and particularly so in the second half of the second year. However, the results were less robust with respect to the period dummies, and thus, the second study aimed at presenting more conservative findings of a positive albeit insignificant relationship for East Germany, while, simultaneously, emphasising the very small sample size.

With respect to the likelihood of employment and the number of hours worked, the empirical results showed a positive association with higher levels of childcare provision, again particularly among West German mothers. However, for those mothers, the positive relationship seemed to be driven by part-time employment and by second births, and mostly among mothers with medium and high levels of education. Conversely, the link with full-time employment seemed to be limited to highly educated mothers, who are usually assumed to have higher opportunity costs of non-employment as well as less traditional work-care norms. For the much smaller sample of East German mothers, the results provided tentative evidence that higher levels of childcare coverage, especially full-time places, are positively associated with less part-time and more full-time employment, particularly among mothers with medium education levels.

In sum, the results lend support to the literature on the relevance of institutional change on life course changes in gender ideologies as well the literature on the positive relationship between public childcare provision and maternal employment. From a broader perspective, the results confirm previous studies that show supportive family policies to facilitate maternal employment (Morrissey, 2017 for an overview) as well as less traditional gender ideologies (Gangl and Ziefle, 2015; Ellingsæter, Kitterød and Lyngstad, 2017; Unterhofer and Wrohlich, 2017). However, the associations between higher levels of childcare provision and shorter employment interruption durations, as well as the likelihood of being in part-time or full-time employment, and the number of hours worked seemed to be more pronounced for West Germany. From a more general perspective, these different results might provide additional support to previous studies suggesting that increased childcare coverage has greater effects on maternal employment in contexts where childcare was severely rationed before (Brilli, Del Boca and Pronzato, 2016 on Italy; Havnes and Mogstad, 2011 on Norway). Overall, this study provides further evidence that family policy reforms, in this case an expansion of childcare services, may facilitate change in gender ideologies within the life course, and facilitates maternal employment with respect to shorter interruption durations and overall employment participation, particularly in more substantial employment such as part-time or full-time, work compared to only marginal labour supply.

While this thesis is the first to analyse maternal employment and short-term changes in gender ideologies by focusing on the recent period of increased childcare provision, some important limitations need to be considered.

Firstly, in all studies, subsample analyses, particularly for East Germany, are based on relatively small sample sizes that do not allow for further differentiation among subgroups. Hence, the findings for East Germany as well as subgroups, for example with regard to employment participation of mothers after first and second births, or among mothers with different educational levels, are based on a very small number of mothers and, hence on only small variation in county-level childcare provision. Thus, particularly the results for the subgroups analyses, but also for the whole of East Germany, should be interpreted with caution.

Secondly, by exploiting macro-level variation in childcare provision and a wide range of individual-, household- and county-level control variables, all studies try to account for unobserved heterogeneity, however, some methodological shortcomings in the empirical design have to be addressed. By applying fixed effects regression models, the first study, investigating short-term changes in gender ideologies, aims at rigorously accounting for time-constant unobserved heterogeneity. Yet there remains a small risk of bias due to other unobserved time-varying characteristics. Due to a lack in data, the analysis might insufficiently capture all relevant individual

trajectories meaning that any other potential sources of changes in gender ideologies may be missed. In addition, the analysis lacked available macro-level data that might correlate with the childcare expansion, such as data on the quality of regional childcare provision. However, some authors argue that the quality remained roughly stable over time (Schilling, 2014).

While the two studies, focusing on maternal employment, also rely on individual-level survey data from the Socio-economic panel study in combination with county-level data on annual childcare provision, however, their methodological design does not facilitate a causal interpretation of the estimates. With regression models that are based on within- and between-variation, the risk of a bias remains due to other unobserved characteristics. These might include individual gender ideologies, partners' involvement in domestic work or occupational gender segregation in pre-birth employment and county-level childcare quality, which may correlate with the childcare expansion, childcare take-up or maternal employment (Schober and Spieß, 2015). However, applying estimation strategies that rely exclusively on the within-variation of childcare provision at the county- or individual-level such as fixed effects models did not provide robust results due to a lack of sufficient variation in individual- or county-level employment of mothers. Hence, the two studies on maternal labour market behaviour present analyses that exploit both within- and between-variation of county-level childcare provision and, therefore, do not exclusively rely on the increase in childcare provision over time.

Lastly, all three studies face the challenge of disentangling differences in maternal employment and changes in gender ideologies resulting from the variation in childcare provision, from changes that might result from the long lasting adaption process to the new parental leave benefit introduced in January 2007. With respect to the expansion in childcare services, annual administrative childcare data only became available with the start of the expansion in 2006.³⁷ For this reason, earlier studies focusing on the period before 2007 make use of childcare data provided once every four years. However, these data on childcare availability are measured in slots per 100 under-threes, whereas data after 2006 measure childcare attendance ratios, thus, this thesis focuses predominantly on the post-expansion period. However, due to the simultaneous parental leave reform in 2007, changes in maternal employment and gender ideologies might also be slightly related to a slow adaption in gender ideologies on the societal level as well as to overall gender culture. Given no suitable data on gender ideologies in the SOEP, unfortunately, the analyses of maternal employment behaviour might not sufficiently account for any delayed adaptation process across time. Consequently, the results could capture not only the

³⁷ In fact, administrative county-level childcare data have only been publicly available since 2007, as data for 2006 have been withdrawn by the Federal Statistical Office and are available only upon request. To date, to the author's knowledge the precise reasons why are not yet known.

effects of higher levels of public childcare services, but also a phenomenon of more general cultural change accompanying the paradigm shift in German family policy.

2 Concluding Discussion and Outlook

Despite the limitations, the thesis contributes to the understanding of maternal employment and changes in gender ideologies with respect to the provision of higher levels of childcare services. Particularly the study on changes in gender ideologies is one of the first to provide evidence on the positive link between changes in childcare policy and short-term changes in gender ideologies within the life course. With respect to the second and third study on maternal employment, their findings align with previous studies highlighting the importance of high childcare coverage levels for maternal employment. Given that the role of employment-led policies, such as childcare policies, have gained importance on the EU level and at the national level of most member states, the studies provide additional support on how work-family policies may facilitate maternal employment but also less traditional gender culture.

Moreover, the different results on East and West Germany provide first insights on the diverse consequences of an expansion of public childcare provision in two contexts that differ remarkably in their pre-expansion levels of childcare provision, maternal employment, labour market characteristics, and traditional gender ideologies. With respect to the change in gender ideologies, findings revealed a positive relationship between childcare provision and less traditional gender ideologies, particularly among West German mothers. Similarly, the association between higher levels of childcare provision and shorter employment interruption durations, as well as the likelihood of being in part-time or full-time employment, and the number of hours worked seemed to be more pronounced for West Germany. Hence, from a more general perspective, the different results might provide additional support to previous studies suggesting that increased childcare coverage has greater effects on maternal employment in contexts where childcare was severely rationed before (Brilli, Del Boca and Pronzato, 2016 on Italy; Havnes and Mogstad, 2011 on Norway). Nevertheless, future studies should evaluate whether the increase in childcare provision has also further reduced the already comparatively shorter family related employment interruptions of East German mothers.

Furthermore, all three studies make an important contribution by emphasizing important differences in the observed associations, not only with respect to East and West Germany, but also with respect to mothers' socioeconomic backgrounds. Particularly among West German mothers, the associations between childcare provision and maternal employment behaviour were more pronounced after a second birth compared to first births. These findings suggest that

childcare policies are more likely to alter the employment behaviour of most West German mothers if family formation is likely to be completed. This is supported by previous research, which has provided evidence for a more pronounced and persistent two-child norm (Diabaté and Ruckdeschel, 2017) and a tight spacing of two to four years between a first and second child (Kreyenfeld, 2008) among West German mothers, particularly for mothers with high educational attainment (Brehm and Buchholz, 2014; Kreyenfeld, 2002). As mothers might expect employers to be averse to a temporary return to employment, they may perceive this as less beneficial than a single but longer employment interruption. Consequently, childcare is likely to become particularly important only after family planning is complete and, hence, for most West German mothers after the birth of their second child.

In contrast, the more profound associations between full-time childcare coverage and full-time employment among mothers with a second child in East Germany are less likely to be explained by the two-child norm. With a two-child norm that is less pronounced, a larger gap between births in the case of two child families, and a much higher level of childcare provision across all counties, it comes as somewhat of a surprise to observe that there are also stronger associations between childcare and maternal employment among East German mothers with a second birth. However, it seems that, especially in childcare centres in East Germany, it has become common to give children with an older sibling in childcare priority access to a childcare place.³⁸ Hence, particularly in counties with a scarce supply of childcare places, mothers with only one child might have greater problems to find a place in formal care, and thus, to return to employment shortly after birth. While Bauernschuster, Hener and Rainer (2016) found positive effects of the childcare expansion on fertility, in particular on second and third births, unfortunately the authors concentrate only on West Germany. Hence, future studies should aim at disentangling the effect of public childcare on maternal employment by taking into account the care arrangement of older children in the household and changes in childcare demand though altered fertility behaviour.

Lastly, the results also point to important educational disparities in the association between childcare provision and changes in gender ideologies, as well as maternal employment. However, the results are to some extent inconclusive. Considering West Germany, analyses by education revealed stronger change towards less traditional gender ideologies among mothers without a college degree. However, changes were not significantly mediated by maternal employment transitions. At the same time, the positive relationship between childcare provision

³⁸ See, for example, the information page of the city of Leipzig where it is stated that when applying parents should indicate whether a sibling is already enrolled in childcare, and that this information will be taken into account when assigning places to parents <https://www.meinkitaplatz-leipzig.de/de/Home/FAQ>.

and maternal employment among West German mothers seemed to be particularly pronounced for those with medium and high levels of education. This might suggest that less educated mothers in West Germany, who held the most traditional values (Stahl and Schober, 2017) and showed a comparatively weak attachment to the labour market before the childcare expansion (Drasch, 2013; Konietzka and Kreyenfeld, 2010), were more receptive to the increase in childcare provision with respect to their gender ideologies. However, in combination with previous finding of persistent and low levels of childcare take-up and employment of less educated mothers (Stahl and Schober, 2017) across the reform period, the findings on maternal employment might provide tentative evidence that the increase in childcare provision has been less effective in supporting maternal employment among mothers with low levels of education. With respect to educational disparities in East Germany, however, the analyses found increase childcare provision to be negatively associated with traditional gender ideologies as well as, surprisingly, a negative association between childcare and maternal employment among mothers with higher levels of education. Hence, these findings contradict previous studies on the impact of family policies, which have been found to support maternal employment particularly among mothers with higher levels of education (e.g., Drasch, 2013; England, Gornick and Shafer, 2012; Fitzenberger, Sommerfeld and Steffes, 2013; Kluge and Schmitz, 2014; Kluge and Tamm, 2013; Stahl and Schober, 2017; Struffolino, Studer and Fasang, 2016). While the two studies, investigating the educational disparities in the respective association, both aim at providing a short theoretical explanation with respect to the specific context in East Germany, there is a need for future research to investigate the process of ideology formation and disparities in employment in a more in-depth fashion.

In sum, the findings of the three studies emphasise the importance of public childcare provision. From a general perspective, the findings emphasise that family policies, which strengthens the dual-earner model, such as public childcare provision, alters mothers' gender ideologies behaviour as well as maternal employment. Hence, the results stress the importance of childcare provision, particularly full-time childcare, in both East and West Germany. Nevertheless, future research should take on a number of theoretical and methodological challenges that the thesis could not adequately address.

Given the tremendous paradigm shift in German family policy, the question of whether the interrelated reforms in childcare and leave policies are overall associated with heterogeneous reform effects has not yet been answered satisfactorily. Particularly with respect to important subgroups such as lone mothers, families with a migration background, or families at risk of poverty, future research should evaluate how the changes in the overall policy framework relate

to changes in inequalities in paid employment. Thus, future research should differentiate between mothers' socioeconomic backgrounds, as well as employment histories, to investigate heterogeneous policy effects among various social groups and labour market contexts. Similarly, a more differentiating perspective could help to further understand unintended consequences of family policy change (Hegewisch and Gornick, 2011). With respect to the childcare expansion, these might not only include self-selection processes into childcare take-up and maternal employment (e.g., Stahl and Schober, 2017; Becker, 2010), but also discrimination with respect to the application process in childcare facilities, differences in childcare quality that affect maternal employment (Schober and Spieß, 2015), or changes in fertility decisions due to a strengthened labour market integration also after the birth of the first child (e.g., Keller, 2015; Krapf, 2014).

Given the generally positive association between childcare provision and maternal employment and changes in gender ideologies, future studies should carefully investigate which factors influence the decision making process on work-care arrangements on the individual- and household-level. This understanding could help to disentangle the different transmission mechanisms of family policies to the couple level, which are linked to educational, and income inequalities, differences in household composition and gender ideologies or information asymmetries. Considering the important role of gender ideologies, future research needs to further develop and test a robust theoretical framework that, firstly, helps to explain the formation and change of gender ideologies within the life course and, secondly, might contribute to the understanding of decision making when it comes to individual policy take-up. Moreover, previous findings have highlighted the role of the partner with regard to the division of paid and domestic work among couples, and thus for women's employment transitions, (e.g., Bröckel, 2016; Golsch, 2012; Hoherz, 2014; Triebe, 2013; Schober and Zoch, 2015, for an overview see Schober, 2014). Consequently, future approaches should account for the important role of the partner, to investigate more thoroughly, which important mechanisms are at work at the individual- and couple-level with respect to work-care decisions. While this is not only interesting from an academic point of view, these insights might be highly relevant for policy makers in order to implement more targeted and effective work-family policies.

While this thesis has focused on the analyses of the associations between childcare provision for under-threes and maternal employment and gender ideologies, future research should aim at investigating these outcomes in relation to the overall family policy context. By focusing on childcare provision and the maternal employment situation of mothers with a child aged under three, the analyses of this dissertation have focused on a rather narrow, however most important, time frame of women's labour market participation, and thus adopt more of a "snap-

shot” view on labour market inequalities with respect to a specific childcare policy. Consequently, a study that would take into account the overall policy packages, i.e. multiple related family policies such as childcare for various age groups, parental leave and tax policies, which are assumed to interact with each other, would seem particularly promising. As a whole, this policy package might foster the division of paid and domestic work among couples rather differently compared to the results based on a perspective that focuses exclusively only on a single policy of this policy package. Additional policy changes, such as increased provision of all-day schooling (Gambaro, Marcus and Peter, 2016) or the most recent parental leave reforms, the introduction of the ElterngeldPlus (BMFSFJ, 2016; Deutscher Bundestag, 2014), might have also facilitated maternal employment. Consequently, it seems beneficial to take into account not only available care options for the youngest child in the household, but also to consider how further care options for older siblings or fathers’ parental leave take-up might affect the work-care arrangement of the household. Hence, future approaches that investigate the effect of increased childcare services of under-threes should consider these additional policy changes.

Related to this, the cumulative effects of multiple transitions with regard to family formation and employment participation have to be taken into account when analysing maternal labour market inequalities. As this thesis has discovered considerable variation in results with regard to first and second births, it seems likely that multiple childbirths contribute to a cumulative effect on employment trajectories with respect to later transitions (e.g., Struffolino, Studer and Fasang, 2016). Hence, future research should acknowledge that life course transitions build on each other and, hence, establish an endogenous relationship (Kohli, 2007). Thus, future approaches should consider the effects of the policy mix on employment and career trajectories more from a life-course perspective. In light of this, it seems promising to focus on mothers with a completed fertility history to disentangle the effect of family policies conditional on the observed birth during the female life course.

Lastly, it seems necessary to answer the question of whether, and to what extent, findings on policy effects from specific contexts can be translated to other countries (e.g., van der Lippe and van Dijk, 2002). To date, various studies that apply micro-macro studies to evaluate single policy changes have gained important insights on the relevant relationship between family policies and inequalities in paid and unpaid work and care across the life course. However, it is not yet clear to what extent these findings can be translated to contexts that differ with respect to gender culture, or labour market characteristics. In the case of Germany, the current family policy model of optional familialism provides a mix of policies that is to date rather unique in the

international context. Hence, future studies should aim at increasing the standardisation of policy analysis, and try to integrate more of the overall policy framework in order to facilitate the comparison of findings from micro-macro studies across different contexts.

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