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Family Formation and Labour Force Participation

Maternal Employment and Educational Differentials in Europe

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Despite the rise in maternal employment in Europe between 1970 and the 2000s, women's labour market positions continue to depend much more strongly on family formation compared to men's and social policy research highlights the importance of female employment in the prevention of social risks. The available literature on educational gradients in maternal employment is largely based on cross-sectional comparisons. This study is among the first to decompose educational differences in maternal employment into differences prior to motherhood and differential effects of childbearing on employment. Drawing on longitudinal microdata (Generations and Gender Survey) for France, the Netherlands, and Hungary, participation in the labour force is studied using mixed effects logit models. In addition we distinguish part-time and full-time work. In line with available literature, clear positive educational gradients in maternal employment are found. These educational gradients largely reflect positive educational differentials already existing before the onset of family formation. This finding is related to the fact that highly educated women typically aim to establish a career before starting a family, but also witness greater labour market opportunities in general. This study finds stronger temporary drops in labour force participation among high educated women which can be explained by higher uptake of leave schemes in these groups. Decomposing part-time maternal employment indicates that educational differences are much less strongly determined by differences before motherhood as the strongest positive educational gradients appear after the birth of a second child.

Keywords: Maternal employment, Education, Europe, Part-time work, Generations and Gender Survey.

1. Introduction

Female labour force participation in Europe has increased between 1970 and the 2000s, with the greatest rise for mothers (Hynes and Clarkberg, 2005). Mothers of young children re-enter the workforce more quickly following childbirth suggesting that the male breadwinner model is increasingly abandoned (Gaudet et al., 2011; Dex et al., 1998). Despite the rise in maternal employment, women's labour market positions continue to depend much more strongly on family formation compared to men's. As a result, contemporary policy-makers and social policy researchers highlight the importance of female employment in the prevention of poverty (Cantillon et al., 2001; Morel, 2007; Juby et al., 2005) as non-employment due to family formation may result in lower human capital and wage potential (Gutiérrez-Domènech, 2005; Beblo and Wolf, 2002; Kenjoh, 2005), but also higher unemployment risks and less professional mobility in the long run (Shapiro and Mott, 1994; Felmler, 1995).

The relation between family formation and female employment has been high on the demographic research agenda for decades (Becker, 1960). Research finds lower activity when (young) children are

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present in the household (Brewster and Rindfuss, 2000; Nakamura and Nakamura, 1994), but also that, as the age of the child increases, women increasingly return to the labour force (Giannelli 1996; Joshi et al. 1996; Dex et al. 1998). However, relying on cross-sectional data, many contributions are subject to a life-course fallacy and fail to control for employment before motherhood which has been shown to affect maternal employment patterns (Matysiak and Vignoli, 2010; Nakamura and Nakamura, 1994; Gaudet et al., 2011; Kil et al., 2015).

Concerning educational differences in maternal employment, higher educated mothers are found to be more likely to be employed (e.g. Dex et al., 1998), whereas lower educated mothers show stronger home attachment (Bernhardt, 1986). Despite the fact that many contributions assess educational differences in maternal employment, few contributions distinguish between educational differences in employment before the onset of family formation and educational differences in the effect of fertility on employment. The foremost novelty of this study is the decomposition of educational differences in maternal employment into differences existing prior to motherhood and changes in employment after the birth of the first and second birth. This approach allows us to assess to which degree educational differences in maternal employment are primarily driven by differential employment before parenthood or different employment trajectories after childbearing. Hence this study aims to indicate to which degree social policy geared towards employment before motherhood or towards the impact of childbearing on employment may yield more educational equality in maternal employment. This article studies France, the Netherlands and Hungary as these countries reflect some of the strong variations in European social policy towards maternal employment (Salles et al., 2010). France is often grouped with Belgium and even Scandinavian countries which enable mothers to remain full-time employed with minimal career disruptions due to the provision of childcare services, whereas the Netherlands is frequently grouped with Germany, Italy and other OECD countries where family policies oblige mothers to (partly) leave the labour force until their child enters the educational system (Gornick et al., 1997; Anttonen and Sipilä, 1996). Hungary is characterized by its communist legacy which has strongly determined contemporary Hungarian social policy (Avdeyeva, 2009).

2. Educational differences in female employment in three distinct settings

The developmental approach to women's employment behaviour (Blair-Loy, 2003; Garcia-Manglano, 2014; Gerson, 1986) combines explanatory narratives of socialization theories and structural theories. Socialisation theories emphasize that women's employment decisions are driven by their preferences and attitudes which are partly determined by socialisation. In contrast, structural theories approach female activity as the outcome of social conditions and opportunities (e.g. labour market opportunities, availability of childcare). The developmental approach to women's labour market choices claims that whether women decide to withdraw from the labour market, work part-time, or work-full-time results from her preferred mode of behaviour given the options available.

2.1 Female employment and educational attainment

2.1.1 Female employment before motherhood

Literature indicates that, besides the importance of aggregate-level economic cycles and how they affect female sectors of employment (Crompton, 2006; Gutiérrez-Domènech, 2005; Verick, 2009), individual-level employability² also determines job opportunities. The latter depends on the amount of human capital women can draw upon when applying for a position. Higher educated women are

² This paper defines employability as the "ability to gain employment or move to a more suitable job" (McQuaid and Lindsay 2005, p.207).

more likely to find a job due to higher human capital (Gaudet et al., 2011) and crowding out effects (Olah and Fratzczak, 2004; McQuaid and Lindsay, 2005; Dolado et al., 2000).

In line with the developmental approach, we note that whether or not job opportunities result in female employment depends on women's attitudes towards work (Hakim, 2002; Garcia-Manglano, 2014). Highly educated women to a greater degree emphasize their role in the labour force as a means of self-realization and display more positive attitudes toward female employment (Friedman et al., 1994; Buchholz et al., 2009; Neels and Theunynck, 2012a; Alwin et al., 1992). Investments in a career yield greater long-term advantages (e.g. wages, job status) for highly educated women (Liefbroer and Corijn, 1999). Literature shows that highly educated women safeguard their career before entering motherhood (Matysiak and Vignoli, 2010; Liefbroer and Corijn, 1999), whereas groups who find the pathway to stable careers blocked (e.g. low educated groups) may exhibit childbearing as an alternative to a career (Friedman et al., 1994). In a similar sense, entering part-time work at early stages of the life-course may jeopardize long-term career paths for highly educated women due to penalties in terms of on-the-job training, promotions and wages, job security, but also since working part-time might signal less commitment to a long-term career (OECD, 2010; Liefbroer and Corijn, 1999). However, OECD findings (2010) show that the penalty of part-time work is weak in countries showing widespread use of part-time employment (e.g. Netherlands).

2.1.2 Combining work and family

Whereas men's labour market positions are found to be relatively stable over the life course, childbearing is one of the strongest factors depressing women's labour force participation (Garcia-Manglano, 2014; Brewster and Rindfuss, 2000). Mothers who chose to be active in the labour market need to combine work and family roles. Work-family compatibility depends on various contextual and household-level factors (Hynes and Clarkberg, 2005), but also on individual attitudes.

First, family policy can support the combination of work and family. Literature indicates that separate taxation systems – which in contrast to joint taxation encourage two-earner families – are positively related to maternal employment (Gutiérrez-Domènech, 2005). Parental leave is designed to allow parents to focus on childrearing tasks before returning to (full-time) employment (Gaudet et al., 2011; Dex et al., 1998) and parental leave has been found to facilitate women to keep a foothold in the labour force (Gerber and Perelli-Harris, 2009; Pronzato, 2009). However, parental leave also delays women's return to work (Matysiak and Szalma, 2014) and especially long periods of leave hamper the return to work (Lalive and Zweimüller, 2009; Fagnani, 1999; Fitzenberger et al., 2010). Research indicates that high educated mothers are more likely to use parental leave (Wood and Neels, 2014; Desmet et al., 2007) but also that this group is more likely to exhibit short parental leave use and return to work after leave-use (Fitzenberger et al., 2010; Matysiak and Szalma, 2014). Also the availability, affordability, quality, and cultural acceptance of formal childcare affect the combinability of work and family (Fagnani, 2002; Stone, 2007; De Wachter et al., 2014). Available evidence shows a positive educational gradient in the use of (in)formal childcare (Neels and Theunynck, 2012a; Ghysels and Van Lancker, 2009; Paull et al., 2002).

Second, Part-time work allows women to fulfil their role as a mother and as a financial provider (Booth and van Ours, 2013; Laurijssen, 2012). However, depending on the country considered, part-time work is associated with a penalty with respect to future promotions, job security and training. Naturally, part-time work is also related to lower monthly wages which may hamper the financial feasibility of part-time employment, particularly for low educated groups.

Third, household characteristics also impact work-family combinability. The economic necessity to work for lone mothers is greater as they do not have a partner to support them financially (Drobnic et

al., 1999, Jeon, 2008, Smock et al., 1999, Gutiérrez-Domènech, 2005, Dex et al., 1998). Among cohabiting or married mothers, the occurrence of a low-income partner may encourage re-entry into the labour market (Gaudet et al., 2011). In addition gender equality within the household (e.g. division of housework) may encourage maternal employment (Crompton, 2006; Smith, 1985). Literature shows that gender equality within the household is higher for highly educated women (Kil, 2014; Crompton and Lyonette, 2005; Marks et al., 2009).

Fourth, in line with the developmental approach, we note that whether employment opportunities for mothers result into maternal employment depends on women's preferences. Highly educated women show more favourable attitudes toward maternal employment (Neels and Theunynck, 2012a; Neels and Theunynck, 2012b; Scott, 1999).

2.2 The French, Dutch and Hungarian setting

2.2.1 France

The relatively high level of maternal employment in France is often related to the widespread availability of subsidized childcare (Thevenon, 2008; Baranowska-Rataj and Matysiak, 2014; Haas, 2003). The French parental leave system (2-3 years of leave depending on the period considered) is characterised by low benefits. Up to 1994 and 2004, leave-taking was unpaid for the second and first child respectively (Fagnani et al., 2013; Wood and Neels, 2014) and thereafter parental leave benefits remained far below the equivalent of lost earnings (Haas, 2003). The taxation system favours one-earner families, though not to the same extent as in the Netherlands³ (OECD, 2010). The French taxation system includes family income splitting ("quotient familial") lowering tax liability for married couples with unequal incomes (UNECE, 2012).

The share of part-time employment within female employment in France is lower than in the Netherlands, but much higher than in Hungary (Worldbank, 2014). The part-time employment penalty in terms of mean hourly wage, job security, and career opportunities is large in France (OECD, 2010). Compared to the Netherlands, France exhibits high in-work poverty for part-time employees, high shares of involuntary part-time work, and high retention rates. Hence part-time positions in France appear to be relatively unattractive and it seems cumbersome to exit them (OECD, 2010).

2.2.2 Netherlands

The increase in female activity and maternal employment in the Netherlands is ascribed to the expansion of part-time work rather than family policies. The share of children under three attending formal childcare is low (CEC, 2001; Pronzato, 2009; Thevenon, 2008; Lewis et al., 2008; Haas, 2003; Plantenga and Hansen, 2001) and Dutch parental leave policy (since 1991) is also limited in scope (Bruning and Plantenga, 1999). Between 1991 and 1997 only part-time leave was allowed. From 1997 on employees are allowed parental leave for 26 times the number of working hours a week. There is no parental leave benefit, but parents who take parental leave do receive a tax reduction. In addition, up to the 2001 taxation reform, the Netherlands showed a traditional joint-taxation system based on the male breadwinner model (Knijn, 2003).

Hence the compatibility of work and family in the Netherlands relies strongly on the right to work part-time (Ray, 2008). The Part-Time Employment act, passed by the lower house of parliament in 2000, gives employees the right to demand a reduction in working hours (Haas, 2003). As a result Dutch mothers are typically supplementary income providers (Blossfeld and Hakim, 1997; OECD, 2010;

³ The difference in social transfers as a percentage of the difference in gross earnings when comparing a one-earner to a two-earner family is slightly smaller than in the Netherlands (OECD 2010).

Worldbank, 2014). The penalties of part-time work (e.g. mean hourly wages, training) and in-work poverty among part-time employees are low (OECD, 2010). In addition, women with part-time jobs show high levels of job satisfaction and a low desire to change their working hours (Booth and van Ours, 2013).

2.2.3 Hungary

During state socialism, female and maternal employment was widespread due to government pressures to view labour participation as a civic duty, childcare services (nurseries for children under three years old and kindergartens for children from three to six years old) (UNICEF, 1999; Kocourkova, 2002; Baranowska-Rataj and Matysiak, 2014), and low wages (Avdeyeva, 2009; Neels and Theunynck, 2012b). In comparison to neighbouring post-communist states, Hungary exhibits a high degree of consistency in these conditions before and after 1990. Although governmental pressure to view labour participation as a civic duty decreased, an extensive coverage of public nurseries as well as pre-transition enrolment rates in kindergartens were maintained (Avdeyeva, 2009) and low wages remain one of the main drivers of the dual-earner model (Neels and Theunynck, 2012b). The Hungarian taxation system favours one-earner households less strongly than in the Netherlands and France (OECD, 2010).

Hungary is also characterized by a very generous child-related leave system which temporarily steers women to a caring sphere (Avdeyeva, 2009). In 1969 the first type of parental leave (GYES) was extended to the child's third birthday with a flat-rate compensation. In 1985 another type of leave was introduced (GYED) which provided 65-75 per cent of previous income and from 1987 on this leave can be used until the child's second birthday (Avdeyeva, 2009). The post-transition parental leave system is similar to the parental leave policies during communism (Avdeyeva, 2009). In European comparison, Hungary continues to exhibit one of the most extensive parental leave systems, which explains low maternal employment levels for women with children aged 0-3 (OECD, 2015).

Part-time work is very rare in Hungary (OECD, 2010; Worldbank, 2014), and compared to France and the Netherlands part-time employment is associated with a high share of in-work poverty.

3. Research questions and hypotheses

Previous literature shows positive educational gradients in maternal employment (e.g. Gutiérrez-Domènech, 2005; Dex et al., 1998). This paper aims to decompose these educational gradients in order to assess to which degree educational differences in maternal employment reflect differentials already existing before the onset of family formation.

Research question 1: What is the educational gradient in female employment before childbearing and to which degree does the effect of childbearing vary by education?

This article hypothesizes that there is a positive educational gradient in female employment before childbearing since highly educated women experience more labour market opportunities, but also postpone first births until a stable labour market position is reached (hypothesis 1).

A weaker, similar, or even stronger negative effect of childbearing on employment for highly educated women can be expected. First, higher use of (in)formal childcare, shorter leave use, more favourable attitudes toward work-family combination, and higher gender equality within the household for highly educated women may yield weaker effects of childbearing on employment. However, if differential use of family policies and more positive attitudes toward maternal employment occur as a result of higher employment before childbearing, highly educated women will not necessarily display weaker negative effects of childbearing on employment. To the extent

that highly educated mothers can more easily afford periods out of the labour force, or more easily find access to leave schemes, stronger effects of childbearing on employment may occur.

Research question 2: What is the educational gradient in part-time female employment before childbearing and to which degree does the effect of childbearing vary by education?

This study hypothesizes that part-time work before motherhood is less likely among highly educated women since career-investments are required at early stages of the life course for this group. However no negative educational gradient is expected in the Netherlands since part-time work is much less related to career penalties and may constitute a favourable labour market position (hypothesis 2).

To the extent that highly educated women can relax career investments after childbearing, we expect that especially highly educated women will progress to part-time work after childbearing. Highly educated groups may more easily find access to part-time work arrangements, whereas low educated groups to a greater degree experience the financial necessity to work full-time (hypothesis 3).

4. Data and Methods

4.1 Data

We use longitudinal microdata from the first and second wave of the Generations and Gender Survey (GGS). The first wave provides retrospective information on family formation (cohabitation, marriage, divorce, childbearing, ..), whereas in the second wave this information is updated and retrospective employment histories are included⁴. Combining the two waves allows to assess the relation between family formation and employment retrospectively. After selecting women aged 15-49 between 1970 and the year before data collection (2008, 2009-2010, 2006-2007 respectively in France, Hungary and the Netherlands) and excluding retired individuals, students, women who do not witness a 1st or 2nd birth during our observation period, and women with missing data for education, the original sample of 3755 French, 3617 Dutch, and 5728 Hungarian women is limited to 2306 French, 1816 Dutch and 2124 Hungarian women who experience a first child. The sample of women experiencing a first and a second child consists of 1872 French, 1598 Dutch, and 1791 Hungarian women. We use person-month data for France and Hungary, and person-year⁵ data for the Netherlands to study educational differentials in female employment around childbearing.

4.2 Methods

Using hierarchical data (person-periods nested in persons), mixed effects logit models of employment are performed including a random effect at the woman level to control for time constant unobserved heterogeneity. A limitation of the model is that the unobserved heterogeneity is not allowed to vary over time, whereas literature shows that women's preferences change over the life course (Garcia-Mangano, 2014; Evertsson and Breen, 2008; Drago et al., 2006). The first dependent variable (model a) is employment which distinguishes employed women from women who are unemployed, inactive or on parental leave⁶. Hence our first dependent variable reflects whether women are actively

⁴ See www.ggp-i.org for more information.

⁵ The labour market histories in the Dutch GGS do not include monthly data.

⁶ The extent to which the GGS data allow to identify spells of maternity or parental leave use depends on the country considered. The French GGS data includes the category "maternity or parental leave" which does not allow to distinguish between both types of leave. The Hungarian GGS data allows to identify parental leave use but not maternity leave uptake. Using the Dutch GGS data, one cannot identify leave spells and it is uncertain in which category these person-periods are included.

participating in the labour force. Next, for women who participate, we study the odds of part-time employment⁷ (model b).

Two separate sets of models are estimated considering the impact of (I) first births on female employment and (II) second births on female employment. Concerning the first set of models (models 1 and 3), women who do not experience a first birth are excluded. These models compare female employment 3-2 years⁸ before the first birth to female employment up to 10 years after the first birth. Person-periods after the birth of a second child are excluded from this set of models. The second set of models (models 2 and 4) applies to women who experience a first and a second birth. In this set of models we compare female employment 36 to 24 months before the first birth⁹ to female employment up to 10 years after the birth of the second birth. Person-periods after the birth of a third child are excluded. This method is superior to a cross-sectional approach - comparing mothers to women without children regardless of whether the latter group will ever have children – as our approach allows to assess the effect of family formation on employment. The foremost limitation of this approach is that women who remain childless are not considered. Whereas models 1-2 assess changes in female employment after the first and second birth, models 3-4 investigate whether the impact of childbearing varies by educational group. Analyses are performed separately by country in order to allow for country-specific estimates for all covariates, but also to prevent heterogeneity in the educational composition of the populations by country to influence the estimates of educational parameters (Uunk et al., 2005).

The main independent variables¹⁰ of interest are time relative to childbearing (time-varying) and level of education at the time of the survey (time-invariant). The former consists of four categories: 3-2 years before the first birth (reference category throughout the analyses), and 0-2 years, 3-5 years, or 6-10 years after the last birth. Education is based on the international standard classification of education (ISCED): Low (Isced 0-2), Medium (Isced 3-4) and High (Isced 5-6). We also control for union status (time-varying), age (time-varying), and calendar time (time-varying). Concerning union status we identify three categories: no union, unmarried cohabitation, and married. Union status is interacted with educational level to ensure that the interaction between education and time relative to childbearing is not confounded by varying effects of partnering on employment by education. Quinquennial age-groups (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-50) control for age differences in labour force activity. Quinquennial calendar time periods (1970-1974, 1975-1979, 1980-1984, 1985-1989, 1990-1994, 1995-1999, 2000-2008) are included to control for different labour market or policy contexts.

5. Results and Discussion

5.1 Descriptive results

In all three countries we observe a steep decline in labour force activity one year before the birth of the first child (figures 1-3, panel A). Potential reasons for this decline are pregnancy leaves, but also a

⁷ Due to low cell frequencies for part-time work, the distinction between full-time and part-time work cannot be made for Hungary.

⁸ Descriptive results (discussed below) show that from 5 to 1 year before the first birth the educational gradient in female employment is relatively stable. Using different reference periods (e.g. 48-36 months before the first birth) did not alter the results found in this study.

⁹ Thus we consistently consider the same reference group: mothers-to-be 3-2 years before they have their first child.

¹⁰ The distribution of person-periods by all independent and dependent variables is available in the supplementary materials.

positive effect of non-employment first births. Around the time of birth the lowest levels of female employment occur. As the first child grows older, female employment recovers to some degree. For second births a similar pattern is found (figures 1-3, panel B). In addition, figures 1-3 illustrate that our samples become more selective over time as a result of censoring due to a next birth.

Comparing the three countries studied in this paper shows differences in line with section 2.2. France is characterized by a short-lived drop in employment after the first birth which is potentially related to the supportive set of family policies and positive attitudes toward maternal employment. However, the drop due to second births is stronger, which is largely due to a higher degree of leave uptake. The Netherlands is characterized by large shares of part-time work before and after childbearing which is related to Dutch social policy geared toward part-time work. Finally, Hungary exhibits a steep decline in female activity among women with a child aged 0-3 which is swiftly recovered thereafter. As indicated by Figure 3, This short-lived decrease in female employment is largely due to the generous Hungarian parental leave system.

Figures 4-5 show a positive educational gradient in employment before the first child as well as after a first or a second birth. The educational gradient in part-time employment is less consistent over countries and time. For France, a negative educational gradient in part-time work is found before the first birth. This negative educational gradient is also found for one-child mothers, while for two-child mothers the gradient depends on the age of the second child. The Netherlands exhibits a clear positive educational gradient in part-time employment which seems to strengthen after the first and especially the second birth. Part-time work in Hungary is very rare, regardless of educational attainment.

Figures 1-5 about here

5.2 Multivariate results

Before discussing the parameters of interest, we briefly interpret the covariate estimates (tables 1-2). The effects of age groups indicate that women age 15-19 are least likely to be employed around childbearing. Depending on the country and parity-group considered, the highest odds of employment occur among women in their 30s or 40s. On the contrary, the odds of working part-time are relatively high in the youngest age groups. The calendar time periods indicate that the odds of employment around childbearing for women who witness a first or a second birth are highest in recent time periods in France and the Netherlands, whereas a declining pattern over time is found for Hungary. Results for France and the Netherlands also indicate that part-time employment has risen over time. With respect to education, we note that as a result of the interaction between education and union status, the estimates of education cannot be interpreted as a general educational gradient in female employment around childbearing. Educational gradients in labour market participation will be discussed in detail below. The estimates for union status indicate that compared to women who are not in a co-residential union, cohabiting and married women mostly exhibit lower odds of employment and higher odds of part-time employment. Besides stronger effects for higher educated groups in France, few educational differentials are found. Finally we also note that in all models the variance of the unobserved heterogeneity term is significant (tables 1-3). Hence unobserved individual-level factors other than the variables controlled for in the models significantly impact female employment.

5.2.1 Childbearing and changes in female employment

- Motherhood

For all three countries we find that becoming a mother (Table 1) entails lower odds of active participation in the labour force. In line with the descriptive results, France exhibits the weakest drop in employment whereas the Netherlands and especially Hungary show a very strong drop in female employment for women with a first child aged 0-2. Similarly to previous literature we find that as the child grows older, the odds of female employment rise. In France women are found to increasingly enter employment, and this recovery is even stronger in Hungary. However in the Netherlands the odds of employment remain similar as the first child grows older. Among women active in the labour force, the occurrence of a first child is positively related to part-time work in France and even more so in the Netherlands.

- Second birth

The comparison of women's employment after a second birth (Table 2) to their employment before becoming a mother shows that, in line with the descriptive results, having a second child even further depresses the odds of being employed in all three countries. As the second child grows older employment is recuperated, especially in Hungary. For France and the Netherlands the odds of working part-time are further elevated by second births.

5.2.2 Educational differentials

- Educational differences in maternal employment

In line with the descriptive results, positive educational gradients in maternal employment in France, the Netherlands and Hungary are found (Figure 6, panel B)¹¹. Concerning part-time work, French mothers show a negative effect of high education on part-time work particularly for one-child mothers, whereas the Netherlands shows a clear positive educational gradient in part-time employment for one-child and especially two-child mothers (Figure 6, panel D)¹². In the following sections these educational differences in maternal employment are decomposed into differences before motherhood on the one hand, and differential effects of childbearing on the other.

- Before motherhood

Multivariate results also corroborate the descriptive finding of positive educational gradients in employment before childbearing (Figure 6, panel A)¹². Findings indicate that in all countries women with medium and high levels of education are more likely to work 3-2 years before the first birth. Hence female employment before motherhood depends strongly on education. Again in line with the descriptive findings of this study, multivariate results indicate a clear negative educational gradient in part-time work 3-2 years before the first birth in France, whereas the Netherlands is characterized by a positive effect of high education on part-time employment 3-2 years before the first birth (Figure 6, panel C)¹².

- Motherhood

Table 3 indicates whether the effects of the first birth on employment are significantly different for women with medium or high education compared to low educated women. Calculated education-specific effects are presented in figure 7.

In France the drop in the odds of employment after a first birth is weakest for low educated women. This finding is supported by the significant negative differential effects for medium level and highly educated women. Similarly, in the Netherlands the negative impact of a first birth on the odds of employment seems to be weakest for low educated women. However, differential effects are mostly

¹¹ Full results are available in the supplementary materials.

insignificant. Although the effect of a child aged 6 or older is similar for highly and low educated women, findings for Hungary also indicate that the decrease in female employment is significantly stronger for medium level and highly educated women. Hence clear indications for a stronger decline in employment for medium level and highly women are found. Further sensitivity analyses for France and Hungary show that this stronger decline of active labour force participation after the first child for medium level and highly educated is largely explained by higher uptake of maternity/parental leave by these groups.

The trajectory in part-time work after the first birth is relatively similar across educational groups in France and the Netherlands. Although the occurrence of a first child aged 0-5 is associated with a weaker increase in part-time work for women with medium or high education, and the positive effect of a first child aged 6-10 is strongest for highly educated women, no clear pattern of educational differences in the effect of the first birth on the odds of part-time work is found. For Dutch women the rise in part-time work after the birth of a first child is found to be stronger among medium level and highly educated women, though most differential effects for these educational groups are not significant.

- Second birth

In line with the results for first births, the drop in employment after a second birth is weakest for low educated women in France, the Netherlands and Hungary. However, in the Netherlands most differential effects for medium level and highly educated groups are not significant, and in line with the results for first births, the differential effect of a second birth for highly educated women in Hungary disappears when the child grows older than two years of age. Further sensitivity analyses for France and Hungary show that this stronger decline of employment after the second child for medium level and highly educated women is largely explained by higher uptake of maternity/parental leave. The positive effect of a second child on part-time work is significantly stronger for medium level and highly educated women in France and the Netherlands. Whereas in France especially highly educated women exhibit a much stronger rise in part-time employment, this is the case for both medium level and highly educated women in the Netherlands.

Table 1: Exponentiated coefficients (odds-ratios) from mixed effects logit models of activity status, women aged 15-50 who witness a 1st birth, France (1970-2007), Netherlands (1970-2005), Hungary (1970-2008).

	Model 1 ^a									
	France				Netherlands				Hungary	
	Model a		Model b		Model a		Model b		Model a	
	E ^b vs NE		PT vs FE		E vs NE		PT vs FE		E vs NE	
	e(b)	sig	e(b)	sig	e(b)	sig	e(b)	sig	e(b)	sig
Age (25-29 is reference)										
. 15-19	.39	***	1.63	***	.64		1.40		.47	***
. 20-24	.71	***	1.19	***	.95		.85		.80	***
. 25-29	1		1		1		1		1	
. 30-34	1.21	***	.95		1.48	***	.88		1.32	***
. 35-39	1.53	***	.93		1.48	**	.90		1.29	***
. 40-44	2.26	***	.76	**	1.15		.84		1.35	***
. 45-49	2.56	***	1.84	***	.83		.60		1.82	***
Period (1970-1974 is reference)										
. 1970-1974	1		1		1		1		1	
. 1975-1979	.96		.93		.75	*	.57	***	.55	***
. 1980-1984	1.03		1.02		.84		.60	***	.32	***
. 1985-1989	.89		1.56	***	1.13		1.84	***	.30	***
. 1990-1994	1.13		1.61	***	1.90	***	2.11	***	.25	***
. 1995-1999	1.34	***	2.01	***	2.84	***	1.96	***	.30	***
. 2000-2007	1.40	***	2.59	***	3.97	***	2.64	***	.37	***
Education (Low is reference)										
. Low	1		1		1		1		1	
. Medium	2.17	***	.86		1.16		.99		1.93	***
. High	4.33	***	.46	***	1.58		1.40		2.24	***
Union status by education (no union is reference)										
. No union Low	1		1		1		1		1	
. Cohabiting Low	.96		1.32	**	1.43		1.11		.81	*
. Married Low	.61	***	1.26	**	.79		1.29		.99	
. No union Medium	1		1		1		1		1	
. Cohabiting Medium	.55	***	1.22	**	1.17		1.30		.83	**
. Married Medium	.47	***	1.13	*	.76		1.53	*	.60	***
. No union High	1		1		1		1		1	
. Cohabiting High	.42	***	1.38	***	1.27		1.23		1.18	
. Married High	.28	***	1.63	***	.91		1.60	**	.73	***
Duration since 1st birth (3-2 years before 1st child is reference)										
. 3-2 before 1 st child	1		1		1		1		1	
. 0-2 years	.25	***	1.43	***	.10	***	1.97	***	.02	***
. 3-5 years	.31	***	1.30	***	.11	***	2.28	***	.12	***
. 6-10 years	.35	***	1.40	***	.11	***	2.15	***	.13	***
Random-effects parameters										
. Var(const)	3.94	***	7.47	***	2.78	***	2.34	***	5.26	***
model parameters										
N Persons	2306		2099		1816		1605		2124	
N Person-periods	140918		111257		9429		6984		140986	

Significance levels: $p < .050$ (*), $p < .010$ (**), $p < .001$ (***) Source: GGS France, Netherlands, Hungary
a: These models include person-periods 3-2 years before the 1st birth and person-periods 0-10 years after the first birth (including the period of the birth) for women who witness a 1st birth during the observation.
b: FE: Fulltime Employed; NE: Not Employed; PT: Part-time Employed; E: Employed

Table 2: Exponentiated coefficients (odds-ratios) from mixed effects logit models of activity status, women aged 15-50 who witness a 2nd birth, France (1970-2007), Netherlands (1970-2005), Hungary (1970-2008).

	model 2 ^a									
	France				Netherlands				Hungary	
	Model a		Model b		Model a		Model b		Model a	
	E ^b vs NE		PT vs FE		E vs NE		PT vs FE		E vs NE	
	e(b)	sig	e(b)	sig	e(b)	sig	e(b)	sig	e(b)	sig
Age (25-29 is reference)										
. 15-19	.42	***	2.90	***	.47	*	1.74	*	.34	***
. 20-24	.80	***	1.46	***	.96		.92		.89	**
. 25-29	1		1		1		1		1	
. 30-34	1.28	***	1.15	***	1.29	**	.93		1.63	***
. 35-39	1.42	***	1.16	**	1.56	***	.83		2.00	***
. 40-44	1.60	***	1.18	*	1.63	**	.69	*	2.19	***
. 45-49	1.62	***	1.26	*	1.32		.52	*	1.18	
Period (1970-1974 is reference)										
. 1970-1974	1		1		1		1		1	
. 1975-1979	.96		.69	***	.85		.62	***	.88	
. 1980-1984	1.01		.82	***	.89		.79	*	.44	***
. 1985-1989	1.01		1.71	***	1.06		1.83	***	.32	***
. 1990-1994	.93		1.82	***	1.44	**	2.20	***	.28	***
. 1995-1999	.96		1.90	***	1.93	***	2.18	***	.29	***
. 2000-2007	1.29	**	2.03	***	2.45	***	2.50	***	.36	***
Education (Low is reference)										
. Low	1		1		1		1		1	
. Medium	1.59	***	1.14		.97		.91		3.59	***
. High	2.91	***	.68	*	1.83	*	1.69	*	8.91	***
Union status by education (no union is reference)										
. No union Low	1		1		1		1		1	
. Cohabiting Low	.62	***	1.06		1.13		1.40		.77	*
. Married Low	.50	***	1.31	**	.91		.90		1.19	*
. No union Medium	1		1		1		1		1	
. Cohabiting Medium	.51	***	1.24	**	1.03		1.31		.73	**
. Married Medium	.58	***	1.31	***	.95		1.63	**	.55	***
. No union High	1		1		1		1		1	
. Cohabiting High	.64	***	1.97	***	2.46	**	1.13		.28	***
. Married High	.53	***	1.94	***	.70		1.31		.33	***
Duration since 2nd birth (3-2 years before 1st child is reference)										
. 3-2 before 1 st child	1		1		1		1		1	
. 0-2 years	.12	***	3.23	***	.06	***	3.22	***	.01	***
. 3-5 years	.20	***	2.93	***	.06	***	4.14	***	.06	***
. 6+ years	.21	***	2.67	***	.07	***	4.74	***	.07	***
Random-effects parameters										
. Var(const)	3.43	***	5.42	***	2.90	***	2.61	***	3.23	***
model parameters										
N Persons	1872		1613		1598		1380		1791	
N Person-months	153910		108017		12996		8476		154969	

Significance levels: $p < .050$ (*), $p < .010$ (**), $p < .001$ (***). Source: GGS France, Netherlands, Hungary
a: These models include person-periods 3-2 years before the 1st birth and person-periods 0-10 years after the second birth (including the period of the birth) for women who witness a 1st and 2nd birth during the observation.
b: FE: Fulltime Employed; NE: Not Employed; PT: Part-time Employed; E: Employed

Table 3: Exponentiated coefficients (odds-ratios) from mixed effects logit models of activity status, women aged 15-50 who witness a 1st birth (model 3) or women who witness a 2nd birth (model 4), France (1970-2007), Netherlands (1970-2005), Hungary (1970-2008).

	model 3^a									
	France				Netherlands				Hungary	
	Model a		Model b		Model a		Model b		Model a	
	<i>E^b vs NE</i>		<i>PT vs FE</i>		<i>E vs NE</i>		<i>PT vs FE</i>		<i>E vs NE</i>	
	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>
Duration since 1st birth (3-2 years before 1st child is reference)										
. 0-2 years	.35	***	1.76	***	.12	***	1.41	*	.05	***
. 3-5 years	.38	***	1.68	***	.12	***	1.79	**	.16	***
. 6-10 years	.40	***	1.44	***	.15	***	1.68	*	.16	***
Duration since 1st child by education										
. 0-2 years Medium	.54	***	.72	***	.81		1.60	**	.30	***
. 3-5 years Medium	.71	***	.68	***	.70		1.34		.56	***
. 6-10 years Medium	.80	**	.88		.69		1.17		.62	***
. 0-2 years High	.59	***	.84		.64		1.47	*	.17	***
. 3-5 years High	.71	***	.75	*	.42	**	1.41		.46	***
. 6-10 years High	.66	***	.133	*	.56		1.65		.89	
Random-effects parameters										
. Var(const)	4.01	***	7.53	***	2.76	***	2.35	***	7.08	***
model parameters										
N Persons	2306		2099		1816		1605		2124	
N Person-months	140918		111257		9429		6984		140986	

	model 4^c									
	France				Netherlands				Hungary	
	Model a		Model b		Model a		Model b		Model a	
	<i>E^a vs NE</i>		<i>PT vs FE</i>		<i>E vs NE</i>		<i>PT vs FE</i>		<i>E vs NE</i>	
	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>	<i>e(b)</i>	<i>sig</i>
Duration since 2nd birth (3-2 years before 1st child is reference)										
. 0-2 years	.20	***	2.00	***	.08	***	1.91	***	.03	***
. 3-5 years	.26	***	2.08	***	.08	***	2.61	***	.10	***
. 6+ years	.27	***	2.09	***	.09	***	3.07	***	.09	***
Duration since 2nd child by education										
. 0-2 years Medium	.46	***	1.45	***	.60	*	1.90	**	.16	***
. 3-5 years Medium	.61	***	1.28	**	.59	*	1.81	**	.29	***
. 6+ years Medium	.69	***	1.13		.65		1.73	**	.41	***
. 0-2 years High	.54	***	2.53	***	.83		1.92	**	.33	***
. 3-5 years High	.72	**	2.05	***	.80		1.75	*	.82	
. 6+ years High	.65	***	1.76	***	.91		1.79	**	1.31	
Random-effects parameters										
. Var(const)	3.49	***	5.46	***	2.90	***	2.62	***	3.37	***
model parameters										
N Persons	1872		1613		1598		1380		1791	
N Person-months	153910		108017		12996		8476		154969	

Significance levels: $p < .050$ (*), $p < .010$ (**), $p < .001$ (***). Source: GGS France, Netherlands, Hungarya: These models include person-periods 3-2 years before the 1st birth and person-periods 0-10 years after the first birth (including the period of the birth) for women who witness a 1st birth during the observation.b: FE: Fulltime Employed; NE: Not Employed; PT: Part-time Employed; E: Employed
Controlling for age, education, union status by education, period.c: These models include person-periods 3-2 years before the 1st birth and person-periods 0-10 years after the second birth (including the period of the birth) for women who witness a 1st and 2nd birth during the observation.

Figures 4-7 about here**6. Conclusion**

In line with previous research this study finds a positive educational gradient in maternal employment (e.g. Gutiérrez-Domènech, 2005; Dex et al., 1998). However this study is among the first to decompose educational differences in maternal employment into differences before motherhood and differential effects of childbearing on employment. As expected (hypothesis 1), before motherhood a positive educational gradient in female employment is found. This finding is related to the fact that higher educated women have more opportunities on the labour market due to higher human capital (Gaudet et al., 2011; McQuaid and Lindsay, 2005; Dolado et al., 2000). In addition, highly educated women more often postpone childbearing until a favourable labour market position is reached (Liefbroer and Corijn, 1999) whereas lower educated women may develop childbearing strategies in response to unfavourable labour market positions (Friedman et al., 1994).

Although high education is related to a higher use of childcare and more favourable attitudes toward work-family compatibility (Neels and Theunynck, 2012a; Neels and Theunynck, 2012b; Ghysels and Van Lancker, 2009; Paull et al., 2002 Scott, 1999), this article indicates stronger negative effects of childbearing on female employment among women with medium or high education. This may indicate that differential use of childcare and varying attitudes are a reflection of a stronger attachment to the labour force before childbearing. This study finds that stronger drops in female employment due to childbearing in France and Hungary are largely explained by higher uptake of maternity/parental leave by medium level and highly educated women. Hence positive educational gradients in maternal employment are largely explained by the activity status before motherhood whereas the stronger drops in employment after childbirth for medium level and highly educated women are not strong enough to counterbalance the positive educational gradient which already occurred before childbearing.

Subsequently, this article studies the odds of working part-time for French and Dutch women in employment. The educational gradient in maternal part-time employment is positive in the Netherlands, whereas French mothers display a negative gradient. In line with our approach to female employment, the educational differences in maternal part-time work are decomposed into differences before motherhood and differential effects of childbearing. The negative educational gradient in part-time work before motherhood in France and the positive educational gradient in the Netherlands are respectively related to a strong penalty of part-time work in France and the more favourable characteristics of part-time work in the Netherlands (hypothesis 2). Hence, in case part-time work is penalized, higher educated women will steer away from these positions at early stages of their careers. The trajectories after a first birth are similar across educational groups. As a result, the educational gradients in part-time employment among one-child mothers largely reflect educational differentials which already occurred before the first birth. However, the positive effects of a second birth on part-time employment are stronger for medium level and highly educated women. Hence, this finding suggests that medium level and highly educated women can relax career investments or more easily find access to part-time work arrangements after childbearing, whereas low educated groups to a greater degree experience the financial necessity to work full-time (hypothesis 3).

To summarize, this article finds strong positive educational gradients in employment before motherhood in France, the Netherlands, and Hungary. This educational gradient potentially indicates

fewer opportunities, but also childbearing strategies in response to unfavourable labour market positions for low educated women (Friedman et al., 1994). Since the drop in active labour force participation after childbearing is found to be greatest among medium level or highly educated groups as a result of higher uptake of leave schemes, the positive educational gradient in employment before childbearing is held responsible for the positive educational gradient in maternal employment. Hence labour market policy geared towards access to the labour market and labour force attachment of lower educated groups before motherhood is identified as a relevant route to elevate educational equality in maternal employment. Concerning part-time employment, this article finds that strong rises after the second birth for medium and highly educated women considerably affect the educational gradients in part-time work among two-child mothers. Hence, when the two-child norm is met, highly educated mothers more often opt into part-time jobs which facilitate work-family combination.

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Figure 1: Person-months by activity status and proportion of censoring for women age 15-50, 1970-2007, France, (Source: GGS). **Figure 2:** Person-years by activity status and proportion of censoring for women age 15-50, 1970-2006, Netherlands, (Source: GGS).

Figure 3: Person-months by activity status and proportion of censoring for women age 15-50, 1970-2008, Hungary, (Source: GGS).

Figure 4: Proportion of women in employment and proportion of employed women in part-time employment by education, women who experience a first child, aged 15-50, France (1970-2007), the Netherlands (1970-2006), Hungary (1970-2008), (Source: GGS).

Figure 5: Proportion of women in employment and proportion of employed women in part-time employment by education, women who experience a second child, aged 15-50, France (1970-2007), the Netherlands (1970-2006), Hungary (1970-2008), (Source: GGS).

Figure 6: Effect of education on employment (odds-ratio) 3-2 years before the 1st birth, women aged 15-50, France (1970-2007), the Netherlands (1970-2006), Hungary (1970-2008), (Source: GGS).

Figure 7: Education-specific effects of childbearing on (part-time) employment (odds-ratio), women aged 15-50, France (1970-2007), Netherlands (1970-2005), Hungary (1970-2008) (Source: GGS).