

Motherhood, Employment and Health at Age 50+. Evidence for Europe across Welfare Regimes

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Abstract

We shed light on the health outcomes associated with different combinations of motherhood and employment. First, we identify and compare distinctive life course employment profiles of mothers up to the age of 50 across 14 European countries and four types of welfare regimes. We then investigate the possible link between these work-family profiles and health status in the subsequent life phase, drawing on a comprehensive health index and accounting for endogenous selection. We do not find any significant differences in health between “home-centered mothers” and mothers who participated marginally or intermittently in the labor market. However, “full-career mothers”, who continued to work when their children were little, display substantially better health than their peers. This positive link between steady employment and health is robust to different specifications and alternative health measures. There are however considerable differences across welfare regimes. The association between steady employment, motherhood and good health is strongest in the Nordic countries, while being insignificant in Southern Europe.

Keywords: welfare state, gender, family and work, health

JEL classification: I1, J2

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1 Introduction

The strong increase in female labor force participation, fueled by a big leap in women’s educational attainment, is one of the most important trends in labor markets of the 20th century (Goldin, 2006). This momentous change is most evident for mothers, whose engagement in paid work has increased dramatically. It reflects an expansion of women’s opportunities, but it has also created new tensions and needs. Difficulties with reconciling family and work may be associated with welfare losses and are therefore considered to pose a “new social risk” post-industrial welfare states are challenged to address (Bonoli, 2007).

We contribute to a better understanding of the roles of work and family in women’s life course trajectories, by shedding light on the health outcomes of different combinations of motherhood and employment. More specifically, we identify distinctive life course employment profiles of mothers in Western and Eastern Europe up to the age of 50 and then assess how they are related to health outcomes at a later stage of life. We apply a multinomial treatment model to control for selection into career-paths based on both observable and unobservable characteristics, drawing particular attention to the influence of socio-economic background, early childhood conditions, and the situation at first childbirth.

Our study adds to the existing literature by investigating the relationship between work pathways and health in an European setting, distinguishing between four country groups associated with different types of European welfare state regimes. For our investigation, we use data from the Survey of Health, Ageing and Retirement in Europe (SHARE). This longitudinal dataset provides information spanning the whole lifetime of a representative sample of Europeans who were aged 50 and above in the first decade of the 21st century. It also contains rich data on the current condition of surveyed individuals, including a large set of health indicators. This enables us to use a comprehensive ‘true’ health measure that corrects for the potential bias in self-rated health caused by differences in reporting style across countries and

socio-economic groups.

In our analysis, we do not detect any statistically significant differences in health status between “home-centered mothers”, who devoted their time to familial responsibilities without paid work, and mothers who had either marginal or intermittent employment careers. Our results do however show that women who combined motherhood with steady employment (“full-career mothers”) are endowed with a more favorable health status at mature age. Part of this positive association can be traced back to the link between favorable childhood conditions and the selection of a work-family profile with continuous dual work-family commitment. A disaggregation by country groups indicates that the positive link between full-career profiles and motherhood is strongest in countries associated with the Nordic welfare regime, whereas in Southern Europe there is no significant positive link between steady employment of mothers and their subsequent health after accounting for selection and confounding variables.

2 Literature review

A growing body of literature explores the relationship between women’s employment histories and life course outcomes (see, e.g., [Möhring, forthcoming](#); [Price and Dean, 2009](#)), with some contributions investigating health outcomes ([Frech and Damaske, 2012](#); [Hibbard, 1995](#)). The connection between employment and health is particularly relevant for mothers, since they have to reconcile work with childbearing. For many women, the birth of a child marks a major life course event that crucially shapes subsequent life trajectories ([Jokinen-Gordon, 2012](#)).

Previous empirical evidence indicates that engagement in paid work is generally beneficial for physical and mental health and that employed persons enjoy better health relative to the non-employed or under-employed. Studies by [Pavalko and Smith \(1999\)](#) and [Ross and Mirowsky \(1995\)](#) show that the positive relationship between employment and health persists across race, marital status, and life course stage and is strongest among full-time work-

ing women relative to unemployed or intermittently employed women. In a meta-study, [Klumb and Lampert \(2004\)](#) do not find consistent results across different health outcomes, such as psychological distress, subjective health, cardiovascular risks and disease, and mortality. They do however come to the conclusion that “methodologically sound longitudinal studies confirm the findings of cross-sectional research showing that employment has either beneficial or neutral effects on women’s health” (p. 1016).

[Frech and Damaske \(2012\)](#) find for US mothers that full-time, continuous employment following a first birth is associated with significantly better physical and mental health at age 40 than part-time work, paid work repeatedly interrupted by unemployment, and staying at home without engaging in paid work. Part-time workers with little unemployment report significantly better health than mothers experiencing persistent unemployment. These results complement previous findings for the US by [Hibbard \(1995\)](#), who shows that women in post-retirement age with more recent paid employment have better health than women with no or no recent employment. [Frech and Damaske \(2012\)](#) also provide evidence that mothers more advantaged prior to pregnancy in terms of education and work experience as well as cognitive abilities select into full-time continuous employment, whereas those from disadvantaged backgrounds, young mothers or black and Hispanic ones, are more likely to follow interrupted working careers or to stay at home.

These results can be interpreted as evidence that early life course disadvantages accumulate over time, as more disadvantaged women are less likely to experience the work pathways associated with the most favorable health outcomes later in life. Results obtained by [Tubeuf, Jusot and Bricard \(2012\)](#) for Britain seem to support this claim: Early-life conditions are found to be important predictors of adult health, accounting for almost 20% of explained health inequality. Thus, there is evidence of a cumulation of disadvantage. However, taking other studies – such as [Ferraro and Kelley-Moore \(2003\)](#), [Elman and O’Rand \(2004\)](#), [Hayward and Gorman \(2004\)](#), [O’Rand and Hamil-Luker \(2005\)](#), and [Hamil-Luker and O’Rand \(2007\)](#) – into account, there is not yet a consensus regarding the extent to which the experience of early

disadvantage influences later health outcomes.

Several investigations provide evidence that situations in which the combination of work and care results in work overload and work-family conflict represent negative health determinants. For instance, [Muffels and Kemperman \(2011\)](#) find that women gain in well-being when combining work and care, but only up to a particular limit or ceiling in terms of hours spent after which subjective well-being declines strongly due to the time pressure they face. In line with this finding, [Roxburgh \(2011\)](#) provides evidence for a significantly positive relationship between parental time strains and depression that is largely explained by job demands.

3 Research design

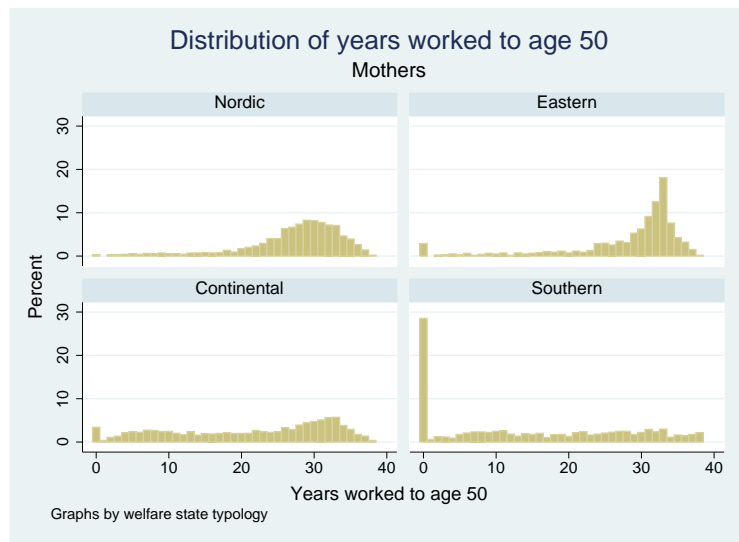
3.1 Empirical strategy

As starting point of our empirical analysis, we classify mothers into different work-family profiles based on two indicators: First, we calculate the number of years a woman was employed until the age of 50 in order to distinguish between mothers who did not work, those who worked for some years and those who worked continuously throughout their prime working age.¹ Second, we measure the number of years a woman was employed as a share of all years with care responsibility for a child below the age of ten in the household (dual commitment). With this indicator, we differentiate between women who worked while having young children at home and those who interrupted their work careers in concomitance with childrearing. Based on the two measures, visual data inspection (see Figures 1 and 2) and sensitivity analysis, we classify women into the following four categories:

- “home-centered mothers” who were active on the labor market for one year or less;
- mothers with marginal employment (at least two but less than 20 years);

- mothers with at least 20 years of work experience, but with (longer) spells of economic inactivity during times in which their children were young (intermittent employment); and
- “full-career mothers” with at least 20 years of work experience and a high share of dual commitment in work and care (defined as having worked at least 90% of the time when at least one child was aged below 10 years).

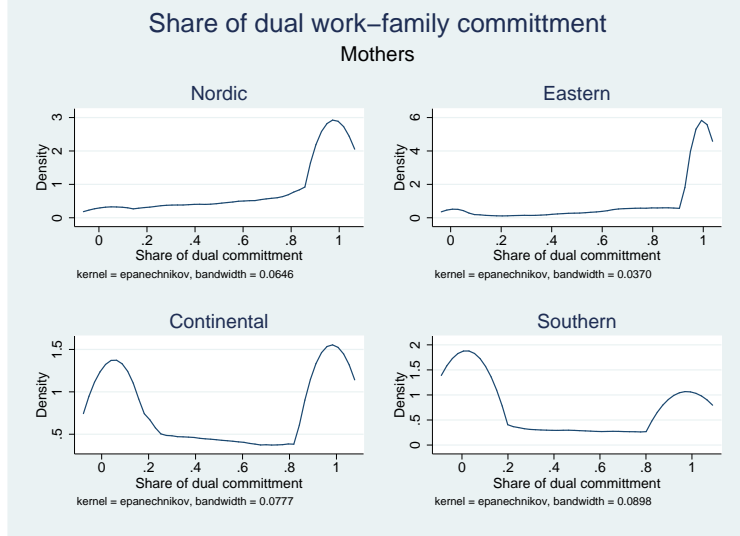
Figure 1: Distribution of the years worked, by welfare regime.



Note: Indicator shows the total number of years in paid employment up to the age of 50.

In the next step, we investigate whether women with different combinations of family and work display systematic differences in health outcomes at a later stage of life. To account for the endogenous selection of women into work-family patterns, we follow [Frech and Damaske \(2012\)](#) and employ a multinomial treatment model developed by [Deb and Trivedi \(2006a,b\)](#). This model is composed of two parts that are jointly estimated: a reduced-form profile selection equation and a health outcome equation with the work-family profile as endogenous category. The model includes latent factors, that are drawn using simulation and allow for correlated unobserved heterogeneity

Figure 2: Time worked in the presence of young children, by welfare regime.



Note: Indicator expresses the number of years in which a women was in paid employment and had children aged below 10 in the household, as a share of all years with young children in the household.

between the two modules. Accordingly, it enables us to distinguish between selection on observables and selection on unobservables.

In our application, each individual i selects into one of a set of different work-family profiles j (multinomial choice). Given that l_{ij} is a latent factor that incorporates unobserved characteristics common to individual i 's profile and health outcome and d_j are binary variables representing the observed profile choice, the probability of profile selection can be represented as:

$$\Pr(d_i, |z_i, \mathbf{l}_i) = g(z_i' \alpha_1 + \delta_1 l_{i1}, z_i' \alpha_2 + \delta_2 l_{i2}, \dots, z_i' \alpha_J + \delta_J l_{iJ}), \quad (1)$$

where z_i denotes exogenous covariates that are predictors of women's work-family profiles. We estimate these selection equations with covariates on women's socio-demographic characteristics, observed 'initial conditions' and situation around first childbirth. We assume that g has a mixed multinomial logit structure conditional on the latent factors (l_{ij}). The probability of

observing individual i in one specific profile can be defined as:

$$\Pr(d_i, |z_i, \mathbf{l}_i) = \frac{\exp(z' \alpha_j + \delta_j l_{ij})}{1 + \sum_{k=1}^J \exp(z' \alpha_k + \delta_j l_{ik})}. \quad (2)$$

The expected outcome equation for individual i is:

$$\mathbb{E}(y_i | \mathbf{d}_i, \mathbf{x}_i, \mathbf{l}_i) = \mathbf{x}_i' \beta_1 + \sum_{j=1}^J \gamma_j d_{ij} + \sum_{j=1}^J \lambda_j l_{ij}. \quad (3)$$

where x_i is a vector of exogenous covariates and β are the associated parameters. Coefficients γ_j represent the effects of work-family profiles on health and are our main object of interest. The latent factors l_{ij} are the unobserved characteristics that influence both profile choice and health outcome. Accordingly the λ are the coefficients or factor loadings associated with the unobserved characteristics. When λ_j is positive (negative), treatment and outcome are positively (negatively) correlated through unobserved characteristics, i.e. there is positive (negative) selection (Deb and Trivedi, 2006a).

The values for the latent factors are drawn using simulation (based on the assumption of a standard normal distribution of density l_{ij}) and the model is estimated using maximum simulated likelihood methods (Shane and Trivedi, 2012).² Although in principle the model could be identified through its functional form even when z_i equals x_i , we aim to accomplish a more robust identification by including exclusion restrictions that influence profile selection without having a direct effect on health.

3.2 Data

Our study is based on data from the second and third wave of the Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE is a multidisciplinary and cross-national panel database of micro-data on health, socio-economic status and social and family relationships of individuals aged 50 and above.³ We draw information on respondents' health status and their household situation from the second wave, which took place in 2006/2007,

and combine it with data from SHARELIFE, the third wave of the SHARE project. In SHARELIFE, which was conducted in 2008/2009, the respondents were interviewed about their life history. Different fields such as socio-economic background, childhood health, education, job career, and family life were surveyed. For the collection of this longitudinal data, a life grid or calendar was utilized to help respondents recall major events of their work and family life.⁴ We use this retrospective information to compute indicators that describe childhood and early adulthood as well as to identify mothers' work and family profiles up to the age of 50.

The longitudinal dataset of respondents surveyed in waves 2 and 3 comprises 23,689 individuals, 11,913 (50.3%) of them are mothers with at least one child. SHARE spans a large number of cohorts (starting from birthyear 1908) and comprises women who reached adulthood before or during World War II. To create a more homogeneous sample for exploring the life course of European women in the post-war period, we restrict our sample to women aged between 50 and 70 years when surveyed in wave 2 (cohorts born between 1938 and 1957). After eliminating observations with missing variables, we are left with a sample of 7,794 mothers.

This sample comprises 14 countries⁵, which can be divided into four groups associated with the welfare regime typology proposed by [Esping-Andersen \(1990\)](#) and later refined by [Ferrera \(1996\)](#) and [Leibfried \(2000\)](#): Nordic Europe (Sweden, Denmark), Continental Europe (West Germany, the Netherlands, Belgium, France, Switzerland, Austria), Southern Europe (Italy, Spain, Greece), and Eastern Europe (Poland, Czechia, East Germany).⁶ Table 6 in the Appendix shows the distribution of respondents in our sample by country and welfare group as well as descriptives for selected variables.

3.3 Variables

Health measure: SHARE contains rich information on respondents' health status and provides a broad range of health measures. Self-rated health (SRH), which is usually measured on a five-points scale, is probably the

most widely used health indicator in studies that are based on survey data. In fact, SRH has proven to be a good measure of an individual’s health and a powerful predictor of individual mortality (see for instance [Idler and Benyamini, 1997](#)). At the same time, there has been growing concern that the comparability of self-reported measures across population groups and countries might be problematic because of group-specific differences in health self-assessment and country-specific differences in reporting. This is the case, because respondents might have different reference levels of health in mind when they assess their own status and because response categories might have different connotations across countries and cultures.⁷

To overcome these limitations, we construct a health index that can be interpreted as a proxy for ‘true health’. This health index, scaled between 0 (near dead) and 100 (perfect health), is calculated following a methodology proposed by [Juerges \(2007\)](#). It accounts for a large number of diagnosed physical and mental conditions as well as measurements such as grip strength and the body-mass index. The index is computed using generalized ordered probit models and accounts for country-specific differences in reporting style. Details on the computation are presented in the Appendix. We check the robustness of our results using as alternative health indicator SRH (on a 1-5 scale with ‘1’ for excellent and ‘5’ for poor).

Covariates: Both the selection equations and the outcome equation contain information on age and years of education, as well as a set of indicators for initial conditions that describe the respondents’ childhood situation. Two variables measure parental cultural capital and socio-economic status (SES): the number of books in the household⁸ and an indicator for housing quality – an index constructed as sum score of five accommodation amenities such as living in a house with central heating and running water. Childhood health is measured by a dummy for poor self-rated childhood health (defined as “fair”, “poor” or “greatly varying”). Furthermore, all equations contain a dummy indicator for cognitive ability (coded ‘1’, if the respondent stated to be better or much better at school than other children in language, maths or both) and a dummy variable set to ‘1’, if the respondent was born in a large city or a

big town. With the exception of this last item, all information on initial conditions was asked with reference to the time when the respondent was ten years old.⁹

In addition to the above mentioned variables, the selection equations include information on age at first childbirth and a dummy variable to indicate whether a woman separated or divorced from her partner when her first child was still young. Since the individual work-family trajectory may have been influenced by health problems that arose in adulthood and were not related to initial conditions, we use SHARELIFE information on injuries and severe illness to construct a further dummy variable ('disability') that identifies respondents who had either an illness or injury that led to limitations for paid work, before they turned 50.

The outcome equation with the health index as dependent variable contains initial conditions as well as additional socio-demographic characteristics from the second SHARE wave such as marital status (with a dummy to identify singles) and household income (in logs). With respect to employment careers up to the age of 50, we use SHARELIFE information on the number of unemployment spells (of at least six months), the number of jobs held by the respondents and the distinction between part-time and full-time employment. SHARE respondents were also asked, whether they experienced periods of particular stress in their lives and, if so, to provide start and end year of these periods. We use this information to prove, whether stress periods have a negative effect on health. Indicators that provide proxy information on the amount of women's paid and unpaid work are the number of children, an indicator for the share of part-time work on total employment years and a dummy for lone mothers (defined as women who raised children without a cohabiting partner).

To control for unobserved country-specific factors, we include country-dummies in both the selection and the outcome equation.

3.4 Exclusion restrictions

For a proper identification of our model, we aim to include in the selection equations factors that influence selection into a work-family profile but have no direct association with health at mature age. We estimate two different models. In a first specification (1), we use two indicators for respondents' relationship status around first childbirth: One dummy to identify women who became mothers without being married ('child out of wedlock') and another dummy variable for women who lost their partner due to death when their first child was still young ('widowhood').

In a second specification (2), which is limited to women who worked (thus excluding "home-centered women"), we add a dummy variable that indicates whether a woman had been in paid employment as well as one indicator for the number of years in paid employment before first childbirth. While these are clearly 'choice' variables that influence the subsequent work-family trajectory, we argue that they should not have a direct impact on health at age 50+.

The predictive power of the chosen variables emerges directly from the model estimates presented in the results section. In the Appendix (Table 7), we additionally present Wald tests for the joint statistical significance of the exclusion restrictions in the different models. The results indicate that overall the restrictions are relevant for explaining the selection into work-family profiles. In the first specification however, our restrictions have a high explanatory power only with respect to the distinction between the "home-centered mothers", marginal employment and career-oriented profile. With respect to the distinction between the intermittent and the full-career profile, only the employment indicators included in the second specification are relevant. For this reason, in the next section we present results for both specification.

With respect to excludability, we provide Wald tests for the joint significance of the restrictions in OLS regressions of the health index on dummies for the work-family profiles and all other control variables. As shown in the

final column of Table 7, none of the exclusion restrictions are jointly significant as explanatory variables for the health index.

4 Descriptives

A descriptive comparison (see Appendix Tables 8, 9 and 10) reveals that “home-centered mothers” are on average older, less educated and live in poorer households than those who combined motherhood with paid work. They can be singled out as those who had the least favorable environment and starting conditions as children. “Full-career mothers” are more educated than the other types of mothers. They have a higher household income and are more likely to live as a single. The descriptives also suggest that “full-career mothers” enjoyed more favorable childhood conditions than their peers: They lived in better accommodations, had parents with higher cultural capital, enjoyed a better health status as children and were more likely to have above-average cognitive skills. Women with intermittent careers are very similar to this group in terms of age, household income, and marital status. They did however have very different employment careers, with considerably higher shares of part-time work as well as more frequent job changes and unemployment spells.

As to family context, “home-centered mothers” and those with limited labor market experience have on average a larger number of children and are characterized by more stable relationship histories, with lower shares of single-hood and of partner loss due to separation. The share of women who report that they had periods of great stress in their lives does not vary much by the extent of employment. However, it is lowest for “home-centered mothers”. Table 8 shows that in a bivariate setting women with the full-career profile are, on average, healthier than those of the other groups. They display a higher health index, are less likely to rate their health as poor and have lower scores on the depression scale. “home-centered mothers” and those with marginal employment careers have, on average, the lowest health status, but the differences with respect to women with intermittent careers are not

statistically significant.¹⁰

As we would expect, there is a high correlation between country groups and women's work-family profiles. Figure 1 shows how years of work and share of dual commitment are distributed. In Southern Europe, there is a very strong presence of women who have never been in paid employment. This is in stark contrast to the corresponding shares in the other country groups, where only small minorities of women have never entered the labor market. The defining trait of Continental European countries lies in the comparatively high concentration of women with moderate levels of employment. The employment profiles of Nordic and Eastern European women, where mothers with long employment careers are the rule rather than the exception, display greater similarities.

As can be seen from Figure 2, similar differences emerge when we look at the share of time women spent in paid employment while having young children at home. Continental Europe displays a bi-modal pattern, with a comparatively high concentration of women with high and low degrees of dual work-family commitment respectively. In Eastern and Nordic Europe, the majority of mothers were employed most of the time when their children were young. In Southern Europe the picture is exactly the opposite.

The distribution of work-family profiles is fairly consistent across families of different size. The share of women with long careers in paid employment decreases with the number of children in all country groups (see Table 1). However, changes in the profile distribution according to the number of children vary between country groups. In Southern and Continental Europe, women with more than two children were much more likely to stay at home and less likely to be continuously employed than those with only one or two children. Even in Eastern Europe, the share of "home-centered mothers" women increases noticeably with the number of children. By contrast, it is very uncommon among women in the Nordic countries to be not working, even when many children are in the household. Only the intensity of employment varies with the number of children. In our total sample, "home-centered mothers" account for a share of 9.2%. 26.4% were marginally and 22.5% in-

Table 1: Distribution of the sample by work-family profile, welfare state regime and number of children

	Number of children				Total
	1	2	3	4+	
Nordic Europe					
home-centered	0.0	0.3	1.0	2.0	0.6
Marginal	8.6	9.5	14.6	36.4	12.8
Intermittent	32.5	33.9	32.9	30.3	33.1
“Full-career”	58.9	56.2	51.5	31.3	53.5
	100.0	100.0	100.0	100.0	100.0
Eastern Europe					
home-centered	1.6	2.2	4.1	9.4	3.5
Marginal	7.3	6.3	15.4	24.8	10.9
Intermittent	16.5	20.0	22.6	24.3	20.5
Full-career	74.6	71.6	57.9	41.6	65.1
	100.0	100.0	100.0	100.0	100.0
Continental Europe					
home-centered	2.5	3.4	3.8	11.8	4.4
Marginal	22.0	36.5	45.8	51.7	37.8
Intermittent	28.1	25.1	24.9	20.0	25.0
Full-career	47.3	35.0	25.5	16.5	32.9
	100.0	100.0	100.0	100.0	100.0
Southern Europe					
home-centered	23.0	30.5	35.2	31.2	30.3
Marginal	29.1	30.2	35.2	45.9	32.9
Intermittent	11.6	10.9	12.4	12.1	11.5
Full-career	36.3	28.4	17.1	10.8	25.4
	100.0	100.0	100.0	100.0	100.0
Total					
home-centered	7.1	10.0	11.0	15.1	10.3
Marginal	19.2	24.5	32.4	42.6	27.5
Intermittent	22.6	21.7	22.8	20.0	21.9
Full-career	51.1	43.8	33.7	22.2	40.3
	100.0	100.0	100.0	100.0	100.0

Note: All values expressed in percent.

termittently employed until the age of 50. Finally, a proportion of 41.8% corresponds to our category of “full-career mothers”.

5 Results

5.1 Work-family profile selection

Table 2 contains the coefficient estimates for the selection equations. Columns one, three and five refer to specification (1) with the full sample and the partnership variables (child out of wedlock and widowhood) as exclusion restrictions. Columns two, four and six refer to specification (2) that includes employment variables before first childbirth and is restricted to mothers with work experience (no “home-centered mothers”). Table 11 in the Appendix contains an overview with a description of the variables.

The results show that factors such as SES of parental household, childhood health and cognitive abilities at age ten have some predictive power with respect to the subsequent selection of women into different patterns of family and employment. In line with our expectations, we find that women who combined motherhood with steady employment tended to be healthier and to have higher cognitive skills as children than the other categories of women. Our estimation results confirm that the moment in which women start a family represents a crossroad with respect to their future employment career. The coefficients on the educational indicator as well as on age and partnership status at birth of the first child are sizable and highly significant. “Full-career mothers” tend to be higher educated and are more likely to have had their first child later in life than “home-centered mothers” and mothers with marginal or intermittent employment.

Partner loss when the first child was young is likewise relevant for selection into a work-family profile: It leads to a strong drop in the likelihood of mothers to stay at home and has a similar but smaller effect on the probability to pursue only marginal employment. There is no such effect in the selection between intermittent employment and full-career trajectories. This

Table 2: Work-family profile selection
Estimates from a multinomial logit model

	Model (1)			Model (2)	
	H	M	I	M	I
Age	0.061***	0.048***	0.01	0.047***	0.009
Poor SRH child	0.252	0.525***	0.226*	0.561***	0.227*
Good student	-0.597***	-0.349***	-0.038	-0.360***	-0.01
Housing index	0.013	-0.033	-0.080***	-0.039	-0.069**
Number books	-0.033	0.017	0.043	0.014	0.077**
Urban	0.087	0.122	0.253***	0.133	0.249***
Years schooling	-0.146***	-0.080***	-0.082***	-0.079***	-0.044***
Age 1 st birth	-0.087***	-0.070***	-0.090***	-0.056***	-0.197***
Separation	-1.639***	-0.482***	0.054	-0.560***	-0.002
Disability	-0.333	0.615***	0.126	0.623***	0.103
Widowhood	-0.965**	-0.515*	0.126	-0.619**	0.056
Child out of wedlock	-0.610**	-0.501***	-0.211	-0.619***	-0.339**
Work 1 st birth				-1.795***	-2.333***
Work years 1 st birth				0.011	0.171***
Constant	-3.883***	-1.705***	2.095***	-0.39	5.157***
Country dummies		Yes		Yes	
N		7,794		6,989	
LogPsLi		-6,876		-6,703	

Note: * p<0.10, ** p<0.05, *** p<0.01. Robust standard errors. Reference category: “Full-career mothers”. H: “home-centered mothers”; M: marginal employment; I: intermittent employment.

suggests that some women pursued full-career profiles because they were the sole breadwinner in the household.¹¹ Motherhood without being married (‘child out of wedlock’) is also associated with continuous employment.

In specification (2), we observe that the likelihood to have a career with only marginal or intermittent employment is significantly higher in cases where a woman was not employed before giving birth to her first child. Interestingly, once we control for labor market participation with a dummy, the number of years in paid work prior to childbearing is not associated with any additional positive effect on the likelihood of full-career motherhood.

5.2 Health outcomes

Table 3 presents the results from the outcome equation of our multinomial treatment model. The first column contains the results from a baseline specification with only age and country-dummies as explanatory variables. The second and third columns include the results for specifications (1) and (2), respectively. Since the conditional mean for the outcome is exponential, our parameter estimates can be interpreted directly in percentage changes in the mean outcome.

All covariates have the expected sign and most of them are highly statistically significant. More educated women as well as those living with a partner and in a household with a high income when surveyed by SHARE wave 2 are more likely to have a good health status. Women with frequent unemployment spells and job changes up to the age of 50 are later found to be less healthy than their counterparts with more stable careers. Part-time work correlates positively with health status, whereas lone motherhood, the presence of periods with high stress levels and also the number of children are negatively related to health outcomes.

The outcome equation suggests a positive and statistically significant link between the full-career profile and subsequent health, before and after accounting for selection. The effect is marginally stronger in a comparison between “full-career mothers” and those who had marginal employment careers, but is otherwise very similar across profiles. In each case, the health index differential between “full-career mothers” and the other work-family profiles amounts to slightly less than 2%. This effect corresponds approximately to the coefficients associated with lone motherhood and with an age difference of 5 to 6 years. We do not detect any significant difference in health status between “home-centered” mothers and those with marginal and intermittent employment careers. This is true also of our baseline specification without covariates.

As indicated by the latent factors (λ_1 to λ_3) displayed in the bottom section of the table, there exists some correlated unobserved heterogeneity between

Table 3: Selectivity-corrected health outcomes.
Estimates from a multinomial logit model

	Baseline	Model (1)	Model (2)
Treatment (Ref: "Full-career mothers")			
home-centered	-0.023***	-0.014**	
Marginal	-0.024***	-0.017***	-0.019***
Intermittent	-0.023***	-0.014***	-0.016***
Age	-0.004***	-0.003***	-0.003***
Poor SRH child		-0.055***	-0.054***
Good student		-0.002	-0.003
Housing index		0.003***	0.003***
Number books		0.002*	0.003*
Urban		-0.014***	-0.015***
Years schooling		0.004***	0.003***
Single		-0.006	-0.006
Lone mother		-0.013**	-0.012*
Nr. of children		-0.006***	-0.005***
HH income		0.006***	0.008***
Unemployment		-0.002	-0.002
Nr. of jobs		-0.003***	-0.003***
Part-time		0.007*	0.007*
Stress		-0.025***	-0.025***
Constant	0.526***	0.338***	0.306***
Country dummies	Yes	Yes	Yes
Inalpha	4.186***	4.243***	4.247***
λ_1 : "home-centered mothers"	0.001**	0.000	
λ_2 : Marginal	-0.001	0.003***	0.005***
λ_3 : Intermittent	0.000	0.002	0.004**
N	7,794	7,794	6,989
LogPsLi	-38,204	-37,681	-32,580

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Outcome variable: Health index, scaled 0-100 (where 100 = perfect health). Maximum simulated likelihood estimates using 'mtreatnb' with $S = 200$. Robust standard errors.

the two components of the model (selection and outcome equation).¹² Based on unobserved characteristics, there is a tendency for healthier women to

select into marginal and intermittent employment. This selection on unobservables is however of limited magnitude.

The results of separate estimations by country groups are depicted in Table 4. They indicate that the positive association between the steady employment and later health status of mothers is stronger in the Nordic and Eastern European countries than in Continental Europe and it is not statistically significant in Southern Europe. This indicates that in the Southern European countries, where “full-career mothers” represent a minority, characteristics such as education and income are sufficient to explain the existing difference in health status between the groups. Interestingly, the number of children (not shown in the Table) does not contribute to explain differences in health status in Northern, Eastern and Continental Europe, but it has a negative and highly significant coefficient in the estimates for Southern Europe.

As a robustness check, we estimate the main model in a number of alternative specifications. The first column in Table 5 shows the results for a specification that is identical to specification (1), but includes two additional “institutional” exclusion restrictions: the presence of unilateral divorce laws (at the time of first childbirth) and the availability of the contraceptive pill at age 18.¹³ These two indicators are plausibly exogenous to individual health and to respondents’ choices. It seems reasonable to assume that the availability of the contraceptive pill increased women’s opportunities to combine motherhood with a career in paid employment and that the presence of unilateral divorce legislation increased women’s incentive to pursue such a career. A disadvantage is that these indicators offer only a limited amount of variation and that information on these indicators is not available for Czechia, Poland, and East Germany.

In specification (4), we restrict the sample to women aged between 50 and 54 years when surveyed in SHARE wave 2. This way, we aim to investigate the existence of a selection bias due to mortality in our sample: The older the cohorts observed, the more likely it is that women who suffered from poor health are not included in the sample because they already died. The last column contains the parameter estimates for a specification identical to (1),

Table 4: Selectivity-corrected health outcomes by welfare regime
Estimates from multinomial logit regressions

	Nordic	Eastern	Continental	Southern
	Model (1)			
Treatment (Ref: "Full-career mothers")				
home-centered	-0.002	-0.051*	-0.019*	0.006
Marginal	-0.032**	-0.035**	-0.014**	-0.008
Intermittent	-0.021**	-0.024**	-0.010**	-0.010
λ_1 : "home-centered mothers"	-0.001	0.002	0.000	-0.003
λ_2 : Marginal	0.007*	0.008**	0.003	0.000
λ_3 : Intermittent	0.008	-0.002	0.002	0.004**
N	1,201	1,500	3,072	2,021
LogPsLi	-5,498	-7,106	-14,812	-10,032
	Model (2)			
Treatment (Ref: "Full-career mothers")				
Marginal	-0.030**	-0.034**	-0.016**	-0.008
Intermittent	-0.023**	-0.025**	-0.011*	-0.013
λ_2 : Marginal	0.005	0.005	0.005**	-0.001
λ_3 : Intermittent	0.010*	-0.000	0.002	0.008***
N	1,194	1,448	2,938	1,409
LogPsLi	-5,404	-6,646	-13,785	-6,532

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Outcome variable: Health index, scaled 0-100 (where 100 = perfect health). Maximum simulated likelihood estimates using 'mtreatnb' with $S = 200$. Robust standard errors.

with SRH instead of the 'true' health index as health outcome variable.

These additional tests confirm that the combination of motherhood and continuous employment is associated with positive health effects at age 50 and above. The link is strongest in relation to mothers who had comparatively short employment careers. The robustness checks do however not corroborate the existence of a clear and statistically significant difference in health status between "home-centered" and "full-career mothers". In specification (4), which is restricted to individuals aged 50 to 54, the treatment coefficient for intermittent employment displays the expected negative sign but fails to reach statistical significance, whereas the coefficient on marginal employment is substantially larger than in estimations carried out with the

Table 5: Selectivity-corrected health outcomes. Robustness checks

	Model (3)	Model (4)	Model (5)
Treatment (Ref: “Full-career mothers”)			
home-centered	−0.011*	0.004	0.043
Marginal	−0.013***	−0.033***	0.505***
Intermittent	−0.010**	−0.007	0.373***
λ_1 : “home-centered mothers”	0.001	−0.001	0.171
λ_2 : Marginal	0.002	0.009***	−0.430***
λ_3 : Intermittent	0.003*	0.000	−0.311**
N	6,294	1,869	7,794
LogPsLi	−30,449	−8,746	−19,053

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Specification (3) includes maternity benefits and availability of contraceptive pill as controls in the selection equations and is based on a sample without the Eastern European countries; specification (4) is restricted to women aged 50 to 54; specification (5) is identical to specification (1), with SRH as outcome variable (scaled 1-5 with 1 = excellent, 5 = poor health). Maximum simulated likelihood estimates using ‘mtreatnb’ with $S = 200$ in specifications (3) and (4) and (5), $S = 50$ in specification (5). Robust standard errors.

full sample. This suggests the possible existence of differences in mortality between groups, particularly with respect to those women who had only marginal employment careers.

6 Summary and discussion

We use longitudinal information on women’s life courses in 14 European countries to investigate the determinants and health outcomes of different combinations of motherhood and employment. Based on two indicators – the number of years in paid employment and the number of years with engagement in both paid work and care for a child aged below 10 –, we distinguish between mothers with no or hardly any paid work experience (“home-centered mothers”), mothers with limited work experience (marginal employment), mothers who crafted their work careers around their family

obligations (intermittent careers), and mothers who pursued simultaneously family and working career (“full-career mothers”). We find strong variation in the distribution of work-family profiles across welfare state regimes. Southern European countries have by far the highest share of women who never entered the labor market, whereas countries associated with the Continental welfare regime are characterized by a high number of mothers with marginal and intermittent employment. The prevalence of full-career work-family profiles is highest in the countries belonging to the former Communist bloc. Nordic Europe stands out with the lowest share of mothers remaining home.

We find evidence for an unequal selection of mothers into the identified work-family profiles. Advantageous initial conditions such as good childhood health, above-average cognitive skills and a favorable socio-economic background tend to be associated with a life course shaped by the combination of motherhood and continuous employment, whereas “home-centered mothers” are those who had the least favorable environment and starting conditions as children. Our results further suggest that the circumstances around first child birth have a high explanatory power for the subsequent sorting into work-family patterns.

We aim to account for this non-random selection by means of a multinomial treatment model with which we explore the relationship between women’s work-family profiles and their subsequent health at the age of 50 and above. Our results suggest that “home-centered mothers” and mothers who participated marginally or intermittently in the labor market do not differ significantly in health outcomes. However, women who combined motherhood with continuous employment (“full-career mothers”) are healthier at a later stage of life than mothers who never participated on the labor market or were employed to a lower extent.

Separate estimations by country group reveal that this positive link between the extent of mothers’ employment and subsequent health is stronger in the Nordic and the Eastern European countries than in Continental Europe and is not statistically significant in Southern Europe. These results suggest that health effects associated with the combination of work and fam-

ily possibly depend on the prevailing cultural norms and institutions that shape women’s opportunities to reconcile family with paid work. The observed positive link between mother’s steady employment and later health status proves to be stronger in countries where work-family reconciliation policies were more developed and also cultural norms were more supportive of mother’s engagement in paid work. In Southern Europe, the combination of family and continuous employment is not related to positive health effects beyond those captured by information on education, income and other observable characteristics.

Our results present some limitations. We caution that it is difficult to fully account for the endogeneity of the work-family profile and therefore we have to be careful in the interpretation of health effects. Additionally, our findings for women aged between 50 and 70 in the time between 2006 and 2007 cannot necessarily be generalized to younger cohorts.

Clearly, more research is needed in this field, also to determine the role played by specific circumstances such as the intra-household division of tasks and other determinants of family-work reconciliation or conflict. Welfare policies and particularly work-family-reconciliation policies have transformed substantially over the past two decades. More specifically, they have been in a process of being redirected so as to adjust to the needs of mothers and fathers who struggle with the complex task of combining family and career (Bonoli and Natali, 2012; Hegewisch and Gornick, 2011; Mätzke and Ostner, 2010). These reforms have hardly affected the work-family trajectories of the women surveyed in our study. Our findings can however represent useful benchmarks to investigate the career choices and the well-being of younger generations.

Notes

¹Based on an analogous indicator, Lyberaki, Tinios and Papadoudis (2013) operationalized the distinction of Hakim (2000) between “home-centered women”, “work-centred women” and “adaptive women”.

²For the estimation we used the STATA routine ‘mtreatreg’.

³For more details on SHARE see the “First Results Book” by [Börsch-Supan, Brügiavini, Jürges, Kapteyn, Mackenbach, Siegrist and Weber \(2008\)](#) as well as the “Methodology Books” by [Börsch-Supan and Jürges \(2005\)](#) and [Schröder \(2011\)](#).

⁴This type of data may be problematic especially if the period of recall spans decades. Studies by [Smith \(2009\)](#) and [Haas and Bishop \(2010\)](#) have validated retrospective data from other comparable studies, the Health and Retirement Survey (HRS), the Panel Study of Income Dynamics (PSID) and the Wisconsin Longitudinal Study (WLS), with objective records for data. Their results point to the general validity of this data generation process. Ex-post analysis checking for internal consistency of SHARELIFE data, as well as comparisons of recall information with external cross-country historical information confirm the high data quality provided by SHARELIFE ([Lyberaki et al., 2013](#); [Mazzonna and Havari, 2011](#)).

⁵Since our sample consists of respondents who reached adulthood between the early 1950s and mid-1970s, we use SHARE information on the part of Germany in which respondents lived before 1989 to classify East Germany as a separate country.

⁶Our sample does not contain any Anglo-Saxon countries, which are typically subsumed under a distinctive liberal welfare state regime.

⁷For a discussion of this issue see [Juerges \(2007\)](#). For instance, older respondents tend to rate their health as better than otherwise comparable younger respondents ([van Doorslaer and Gerdttham, 2003](#)).

⁸Although this variable is ordinal in scale, [Brandt, Deindl and Hank \(2012\)](#) have carried out a test for linearity and shown that it can enter regression analysis as continuous variable.

⁹Similar variables and indicators have been used in other studies based on SHARE, such as [Deindl \(2013\)](#) and [Havari and Peracchi \(2011\)](#).

¹⁰This holds also when we look at each country group separately and when we compare age-standardized means.

¹¹In fact, the share of lone mothers is higher among “full-career women” than in the other groups, see Table 10.

¹²The λ 's express factor loadings associated with the unobserved characteristics that influence both work-family profile choice and health outcome.

¹³The information on the contraceptive pill has been used previously by [Brugiavini, Pasini and Trevisan \(2013\)](#), we would like to thank the authors and particularly Elisabetta Trevisan for making the data available to us. Information on unilateral divorce laws was taken from [Reinhold, Kneip and Bauer \(forthcoming\)](#).

Competing interests

The authors declare that they have no competing interests.

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7 Appendix

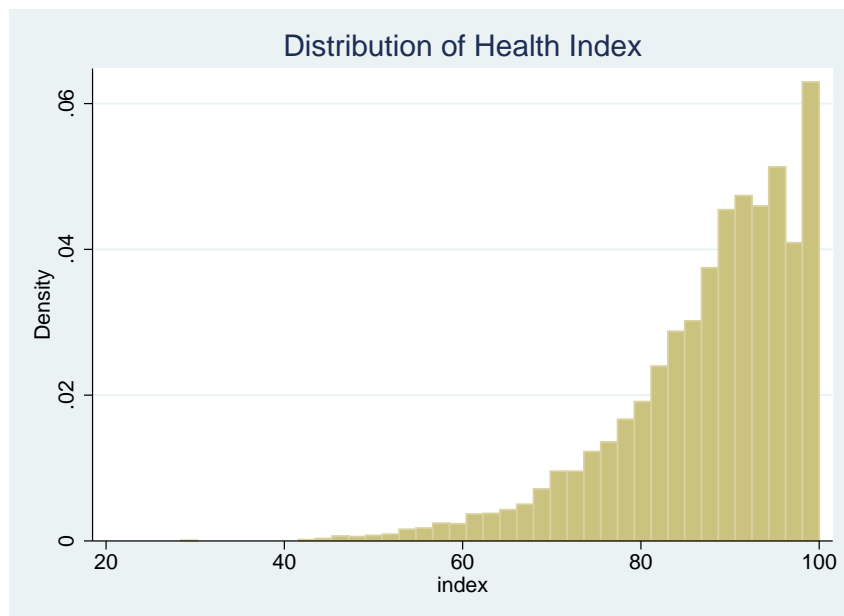
Computation of the Health Index

Juerges (2007) has investigated the reliability of SRH as a “true health” variable in the SHARE wave 1 dataset, and computed a health measure that is adjusted for cross-cultural biases. The methodology of this computation is based on a decomposition of differences in self-assessed health into parts that are explained by differences in “objective” health indicators and parts not explained by such differences. We are interested in the explained part, which provides synthetic information on individual health status while avoiding the possible biases due to reporting differences between countries, cultural areas and socio-economic population groups.

Following Juerges (2007), we use SHARE wave 2 data to construct a 0 to 100 health index that describes as accurately as possible the whole spectrum of health states, from “near death” to “perfect health”. Health states between near death and perfect health are given an index value between 0 and 100. The presence of a condition reduces the health index by some given amount or percentage, the so-called disability weight. The disability weight of each condition or symptom is assumed to be the same for each respondent.

Disability weights are computed from within the sample by estimating generalized ordered probit regressions of self-reported health (SRH) on a set of health variables. In SHARE wave 2 respondents were asked about the presence of chronic conditions diagnosed by doctors (heart disease, cholesterol, stroke, diabetes, lung disease, asthma, arthritis, osteoporosis, cancer, cataracts and fractures) as well as symptoms such as pain, breathlessness and sleeping problems. These informations, together with information on (medically treated) depressions and measures for grip strength, walking speed and the BMI (derived from self-reported height and weight) are used as explanatory variables. In the generalized ordered probit model, thresholds are modeled with country dummies to account for country-specific reporting styles. While thresholds are allowed to vary across countries, disability weights are constrained to be the same in each country.

Figure 3: Distribution of the Health index



The health index is computed as the linear prediction from the ordered probit regression (the latent variable), normalized to 0 for the worst observed health state and 100 for the best observed health state.

Additional Tables

Table 6: Sample characteristics

	Age	Health index	Years school	Nr. child	Age at 1 st bth	Years worked	Dual comm.	N
Austria	61.1	87.8	10.0	2.4	23.4	21.1	0.5	228
Germany	60.1	88.3	13.1	2.2	24.9	21.0	0.5	424
Sweden	61.1	89.2	11.5	2.3	24.9	26.9	0.7	545
Netherlands	59.5	89.4	11.4	2.4	25.4	18.9	0.4	624
Spain	59.9	84.9	7.4	2.9	24.9	13.0	0.3	448
Italy	60.3	85.5	7.5	2.3	24.8	16.2	0.4	799
France	59.1	86.3	9.7	2.5	24.7	22.9	0.6	647
Denmark	58.7	88.0	13.3	2.2	24.3	26.8	0.8	656
Greece	58.9	88.7	9.4	2.1	25.4	12.5	0.4	774
Switzerland	59.6	91.4	11.1	2.3	25.8	19.4	0.4	358
Belgium	59.4	87.9	10.4	2.3	24.5	21.3	0.6	791
Czechia	59.5	85.5	11.5	2.1	23.2	31.3	0.9	695
Poland	58.5	81.9	9.9	2.8	22.9	23.9	0.7	647
East Germany	60.1	86.6	13.6	2.2	22.5	29.6	0.9	158
Nordic	59.8	88.5	12.5	2.3	24.6	26.9	0.8	1,201
Eastern	59.1	84.0	11.0	2.4	23.0	27.9	0.8	1,500
Continental	59.6	88.3	10.9	2.4	24.9	20.8	0.5	3,072
Southern	59.7	86.6	8.2	2.4	25.1	14.1	0.4	2,021
Total	59.5	87.1	10.5	2.4	24.5	21.4	0.6	7,794

Table 7: Evidence on exclusion restrictions

	Exogeneity Chi2, (Prob>Chi2)				Excludability F, (Prob>F)
	home-centered	Marginal	Intermittent	All	OLS
Model (1)					
Widowhood, Out-of-wedlock	10.13 (0.006)	15.50 (0.000)	3.40 (0.182)	23.44 (0.000)	0.21 (0.812)
Model (2)					
Work bef. 1 st birth, Workyrs. bef. 1 st birth		191.58 (0.000)	253.93 (0.000)	338.85 (0.000)	2.91 (0.054)

Note: p-values in parenthesis.

Table 8: Descriptive statistics by work-family profile I

Profile	Health index (0-100)	Poor SRH child (0/1)	Age	Years school	HH income (log)	Years worked (0-1)	Dual comm.
Home-centered	86.0	0.06	60.7	7.6	9.5	0.0	0.0
Marginal	86.4	0.12	60.3	9.7	9.9	10.7	0.2
Intermittent	86.6	0.09	59.6	10.6	10.0	26.1	0.6
Full-career	88.0	0.07	58.7	11.7	10.1	31.5	1.0
Total	87.1	0.09	59.5	10.5	9.9	21.4	0.6

Table 9: Descriptive statistics by work-family profile II

Profile	Good student (0/1)	Housing index (0-5)	Nr. books (1-5)	Out of wedlock (0/1)	Age 1 st birth	Widowhood (0/1)	Separation (0/1)
Home-centered	0.3	1.4	1.5	0.03	24.2	0.01	0.01
Marginal	0.4	2.0	2.0	0.05	24.4	0.02	0.06
Intermittent	0.5	2.3	2.3	0.10	23.7	0.02	0.12
Full-career	0.6	2.4	2.4	0.10	25.1	0.02	0.11
Total	0.5	2.2	2.2	0.08	24.5	0.02	0.09

Table 10: Descriptive statistics by work-family profile III

Profile	Nr. children	Work 1 st birth	Unempl spells (0/1)	Nr. jobs	Part-time (0/1)	Stress periods (0/1)	Lone mother (0/1)
Home-centered	2.6	0.01	0.02	0.1	0.01	0.43	0.02
Marginal	2.6	0.80	0.10	2.1	0.15	0.58	0.04
Intermittent	2.3	0.83	0.25	3.8	0.25	0.63	0.06
Full-career	2.1	0.95	0.14	2.7	0.09	0.59	0.06
Total	2.4	0.78	0.14	2.5	0.13	0.58	0.05

Table 11: Variables description

Label	Description
Age	Age of respondent at SHARE wave 2 (based on birthyear and birthmonth)
Poor SRH child	Dummy, 1 = poor or fair childhood health
Good student	Dummy, 1 = 'better' or 'much better' performance in maths and/or language relative to others
Housing index	Indicator for housing quality, sum score (0-5) of five accommodation amenities
Number books	Indicator for parental SES (1-5) ranging from 0-10 to 200+ books in the household
Urban	Dummy, 1 = growing up in a big city or large town
Years schooling	Number of years of schooling (provided by SHARE)
Age 1 st birth	Age at birth of first child
Separation	Dummy, 1 = separated or divorced from partner while first child was young
Disability	Dummy, 1 = illness or injury that led to limitations for paid work
Widowhood	Dummy, 1 = partner died while first child was young
Child out of wedlock	Dummy, 1 = not married when first child was born
Work 1 st birth	Dummy, 1 = work experience before birth of first child
Work years 1 st birth	Number of years in paid employment before birth of first child
Single	Marital status Dummy, 1 = living as single when surveyed by SHARE wave 2
Lone mother	Dummy, 1 = no cohabiting partner while young children in household
Number children	Total number of biological and adopted children
HH income	Log of household income from SHARE wave 2 (in purchasing power parities)
Unemployment	Number of unemployment spells (of at least 6 months)
Number jobs	Number of distinct jobs (of at least 6 months)
Part-time	Dummy, 1 = worked part-time for at least half of career
Stress	Dummy, 1 = period of life with distinctly more stress