Educational gradient in transition to second birth in Europe: differences related to societal context

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Background and research hypotheses

Associations between second births and educational attainment have been studied extensively and it has been established that in some countries women's higher level of education has no inhibiting effect on the intensity of higher order births. In other countries it operates according to the prediction of microeconomic theory (Becker 1993). The majority of examples about the non-negative effect of high educational attainment come from the Nordic countries and Western Europe (e.g. Hoem and Hoem 1989, Kravdal 2007, Kreyenfeld 2002). On the other hand, in Central and Eastern Europe, the highly educated tend to have lower second birth intensity. Only a few studies cover a larger number of countries applying comparable analytical approach (Klesment et al. 2014) and test the differences in country-level variables (Van Bavel and Rózanska-Putek 2010).

The relationship between women's education and second births has been widely discussed, although with contradictory results. Empirical studies of second birth have found a positive effect of higher education in all Nordic countries and in several countries of Western Europe. Micro-economic theory, from the perspective of women, seems to hold in Eastern Europe where for several countries a negative association between women's educational attainment and second birth intensities has been reported (Koytcheva and Philipov 2008; Perelli-Harris 2008). The results could be explained by weaker opportunity costs in some countries, especially pertaining to the Nordic welfare model. In some countries the positive effect of the woman's education disappears when controlling for male partner's educational attainment (Kreyenfeld 2002), suggesting that it is the income effect that elevates second birth rates. In other countries both partner's education retains a positive effect. Male partner's education is often found positively related to transition to second birth.

In the relevant literature, the educational gradient of second births is often associated with country-specific institutional features and seen as an outcome of context variation. For instance, positive association between women's education and second birth is interpreted as a result of higher compatibility between work and family life. Also, higher score in gender equality is seen as supporting childbearing among highly educated women. Institutional support plays important role in reducing the opportunity costs of having children, for instance through parental leave schemes, labor market protection, and childcare availability (Hobson and Oláh 2006; Matysiak 2011; Neyer 2013). In some context, the income effect of the highly educated is probably stronger than the opportunity cost of childbearing. It is noteworthy that the role of contextual factors is also underlined in an update of the Second Demographic Transition theory to explain the dissimilarity in current European fertility trends (Lesthaeghe 2010).

In an earlier study we provided a comparative stance on the educational gradient in second births in Europe and corroborated many of the previous findings coming from single country studies (Klesment et al. 2014). In this study we investigate how the educational gradient is associated to macro-level variables that shape the environment in which childbearing decisions are made. Our hypotheses are drawn mainly from the micro-economic theory, operating with the opportunity cost and income effect. Contextual factors that imply higher opportunity cost for the highly educated are expected to reduce the positive gradient of the woman's educational level. Factors that are aimed at reducing opportunity costs are expected to support the positive gradient. Similarly, in the context of high level of work-family compatibility, income effect is expected to support the positive gradient of women's educational attainment.

Data and methods

We use EU-SILC cross-sectional data from the 2009 and 2013 survey and apply the own-child method to link co-resident children to their mothers in the same household. Although the dataset is not designed for event history analysis, in the previous study we have validated the results for countries that can be covered by external data (Generations and Gender Survey). To minimize errors in the procedure, we need to apply assumptions and age limitations, some of which are suggested by Bordone et al. (2009). We select only women who are up to 41 years old during the interview who have at least one child at the time of interview.

Among our independent variables are the woman's educational attainment, her enrollment in schooling system, and an indicator variable for her partner's tertiary degree. In order to assess the effect of contextual factors, the respective context variables are interacted with the woman's educational level. Our contextual variables are country-level macro indicators that are obtainable from openly available sources. In most cases, the variable can be observed yearly and we add it to the fixed effects part of the model as a time-varying covariate. Variables of macro-economic conditions include, for example, unemployment, change in cost of living, consumer confidence index. As indicators of work-family compatibility we consider different specifications of childcare enrolment but also a time-fixed summary index of work-family compatibility calculated by Matysiak (2011). The level of gender equality in a country is represented by the respective index calculated by European Institute for Gender Equality[1]. The effect of contextual variables is estimated by adding them one at a time to the model.

We estimate a series of piecewise constant survival models where the event is to have a second child and those who do not experience an event are censored after 10 years or the interview time, whichever comes first. At this stage we have decided to estimate single level models and to control country level heterogeneity by including country dummies.

Preliminary results

In Table 1 we show selected model results, including those with sex-specific unemployment rates, CPI and consumer confidence index, summary work-family compatibility index, and gender equality index. Model M1 suggests that while in general there is a positive effect of women's tertiary education, increasing male unemployment tends to reverse this relationship. In the case of high male unemployment, second birth risks are relatively higher for the low educated and reduced for the highly educated. Interestingly, unemployment rate of women (M2) does not have a similar association with the educational gradient and the overall positive relationship holds in the interaction model. Educational gradient, however, is shaped into U-curve when we interact women's educational attainment with the yearly change in consumer price index (M3). However, consumer confidence index, although being positively associated with transition to second birth, does not change the women's educational gradient (M4).

The summary index of work-family compatibility is inversely related to second birth risks (M5), and this is expected because smaller number in the index denotes higher work-family compatibility. This supporting effect of work-family compatibility influences mostly the medium and high educated women. The low educated are less affected by work-family compatibility. As regards the summary gender equality measure, this is positively related to second birth risk (M6). However, its interaction with women's education completely reverses the positive educational

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[1] http://eige.europa.eu

gradient. We are conducting further analysis to understand why the inclusion of gender equality index has such a strong effect on the educational gradient outcome.

TABLE 1 Piecewise exponential event history model of second birth, odds ratios

	M1	M2	M3	M4	M5	M6
Years since first birth (ref. 3)						
1	0.778***	0.780***	0.780***	0.723***	0.765***	0.802**
2	1.239***	1.241***	1.241***	1.231***	1.238***	1.251***
4	0.668***	0.667***	0.667***	0.660***	0.654***	0.659***
5	0.486***	0.485***	0.485***	0.484***	0.450***	0.482***
6	0.359***	0.359***	0.359***	0.353***	0.343***	0.348***
7	0.249***	0.249***	0.249***	0.251***	0.243***	0.245***
8	0.184***	0.184***	0.184***	0.184***	0.177***	0.178***
9	0.135***	0.134***	0.134***	0.136***	0.135***	0.131***
10	0.115***	0.115***	0.115***	0.116***	0.112***	0.111***
Enrolled in education	0.846***	0.846***	0.846***	0.812***	0.826***	1.009
Man highly educated	1.368***	1.369***	1.369***	1.412***	1.383***	1.388***
Age at first birth (ref. 25-29)						
15-24	1.050	1.051	1.050	1.065*	1.052	1.030
30-41	0.862***	0.861***	0.860***	0.864***	0.852***	0.861***
Woman's educational level (ref. medium)						
Low	0.817	0.961	1.139**	1.085	0.842	1.730**
High	1.329**	1.328*	1.104***	1.146***	1.269	0.861
Contextual variables' interactions with the woman's education						
Male unemployment %	0.929					
X Low educated	1.196**					
X Woman high educated	0.906*					
Female unemployment %		0.963				
X Low educated		1.087				
X Woman high educated		0.912				
Consumer price index change %			1.000			
X Low educated			1.001*			
X Woman high educated			0.999			
Consumer confidence index				1.010***		
X Low educated				0.997		
X Woman high educated				1.001		
Work-family compatibility index					0.548***	
X Low educated					1.623*	
X Woman high educated					0.783	
Gender equality index						1.022***
X Low educated						0.991**
X Woman high educated						1.004

Source: EU-SILC 2009 and 2013 survey.
Note: country dummies, indicator of the woman's singlehood, and indicator for survey year not shown.

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