Educational differences in fertility intentions: a meta-analysis

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1 Introduction

The complex effect of education on fertility has been widely studied in the literature and is a topic of high relevance in research on reproductive behaviour (Kohler and Rodgers 2003). The diffusion of modern contraception has not levelled socioeconomic differentials in completed fertility (Sweet and Rindfuss 1983) and college graduate women usually tend to have fewer children than women with a high school degree or a lower education level (for a review see Björklund 2006). Fertility intentions are an important channel through which education affects fertility. However, the relationship between fertility intentions and education is not necessarily the same as the relationship between actual fertility and education. Empirical evidence indicates that more educated women do not intend to have fewer children than less educated women but they end up with fewer children and they revise their intentions downwards - often than their lower-educated counterparts. Fertility postponement of highly educated women and parity-specific distribution of their fertility intentions (Sobotka 2009) play an important role in reading this contradictory finding. Aim of this study is to investigate the conditions under which a positive relationship between women's educational level and childbearing intentions is observed. Using 44 distinct and selected pieces of research, we conduct a meta-analysis on the effect of education on fertility intentions in order to: *a)* to assess the relationship between fertility decisions and education in a quantitative manner; *b)* to inspect the temporal and cross-country variation in the link between fertility intentions and education.

2 Research questions

Three main hypotheses build the theoretical starting point of our research:

H1) the educational gradient on intended fertility is positive, especially at the beginning of the reproductive career;

H2) the sign and the shape of the educational gradient vary significantly across regions and over time;

H3) Regional differences in the educational gradient are related to structural labour market differences.

3 Data and Methods

The methodology of meta-analysis has been used increasingly in social sciences (Cook and Leviton 1980; Wampler 1982; Amato and Keith 1991; Waldforf and Pillsung 2005; Matysiak 2008; Matysiak and Vignoli 2008; Borenstein 2010). Meta-analysis is used to synthesize and interpret research results from different studies under one topic of interest. Its advantage in comparison to classical reviews of existing literature lies in the clear and systematic way of comparing inter-study results. A first stage consists in a literature review and a selection of suitable research papers according to criteria of comparability. In a second stage, using a standardized procedure, the coefficients of each study are recalculated to the so called *effect sizes*, a comparable measure size of the association between the dependent and the independent variables. The notion of the *effect size*, typical to meta-analysis, refers to the difference in the effect on fertility intentions between highly educated (college degree and more) and low-educated women (less than high school degree).

We prepared the data sample of meta-analysis in four different steps: a) search of appropriate studies in Google Scholar and Web of Knowledge, b) inclusion of previously undiscovered references given/found in the selected papers, c) consultation of experts for recommendations, d) exclusion of papers that did not meet given requirements. At the end of the above four-step procedure we obtained a sample of 44 papers with 128 different study lines (one paper could potentially contain more than one study line, i.e., regression analysis with suitable coefficients). The collected data span from 1979 to 2011 and have a strong regional focus on Europe (92 lines).

4 Preliminary Results

Descriptive analysis. At a first stage, a graphical analysis of the effect sizes across Europe is carried out. In Figure 1 copied below, the so called *forest plot* displays the different effect sizes as black dots across European regions and countries. The variability of each study's effect size, measured by the 95% confidence interval is represented by the black line. The regional and the overall average effect size are displayed by the blue diamond below each

group. The scale of effect sizes ranges from -2.5 to 4. It should be noted that in this study, male (18 study lines), female (54 study lines) and 'gender-pooled' (9 study lines) general intentions about fertility are shown. Furthermore, the outcome variable is here the general childbearing intention, that is, the intention to have a child in the future. Regarding a possible interpretation, positive effect sizes stand for cases in which high educated individuals have higher intentions than their low educated counterpart. For a correct interpretation of the effect size, as well as its variation across time and regions, is it important to point out that changes in effect sizes cannot be entirely disclosed in the chosen model environment. In other words, an increase in effect size, for example, could refer to a lower fertility intention of less educated individuals, a higher level of intentions among high educated, or a combination of both. Looking at the forest plot of Figure 1, we could see a pattern of four different clusters of European countries, with the Southern European countries showing the biggest effect size of education on fertility intentions and, on the opposite, the Northern European countries showing the smallest effect size, while the Central and Eastern European countries take intermediate positions.

Meta-regression analysis. The distinct descriptive pattern of effect sizes across European regions served as a starting point for our meta-regression analysis. The following characteristics, which are assumed to have influenced the educational gradient, have been included as explanatory covariates in the meta-regression: (1) the midpoint of the calendar interval in which the study has been carried out, (2) a dummy for study lines containing only females, (3) a dummy for whether the study has been stratified by parity or not, (4) regional dummies, and (5) structural characteristics of the respective labour markets. One additional possible specification could have been to include a control for the existence of children. Nevertheless, we did not include it because this would have downsized the number of observations and moreover, we could see in a parallel sensitivity analysis that the inclusion of this control did not change substantially the meta-regression results.

Southern Europe, the most homogeneous region, as being represented by Italy, has been selected to serve as a reference category. In comparison to Southern Europe (Italy) all three regional groups, Northern, Eastern and Western Europe, show a smaller gap in fertility intentions between low and high educated. The most pronounced difference in the fertility gap can be noticed between Southern and Northern Europe. These results confirm the descriptive findings shown in the forest plot.

In the next steps of the meta-analysis, we will look at the labour market characteristics and measures of gender equality in order to disentangle these cross regional differences.

Figure 1 Educational gradient on general fertility intention

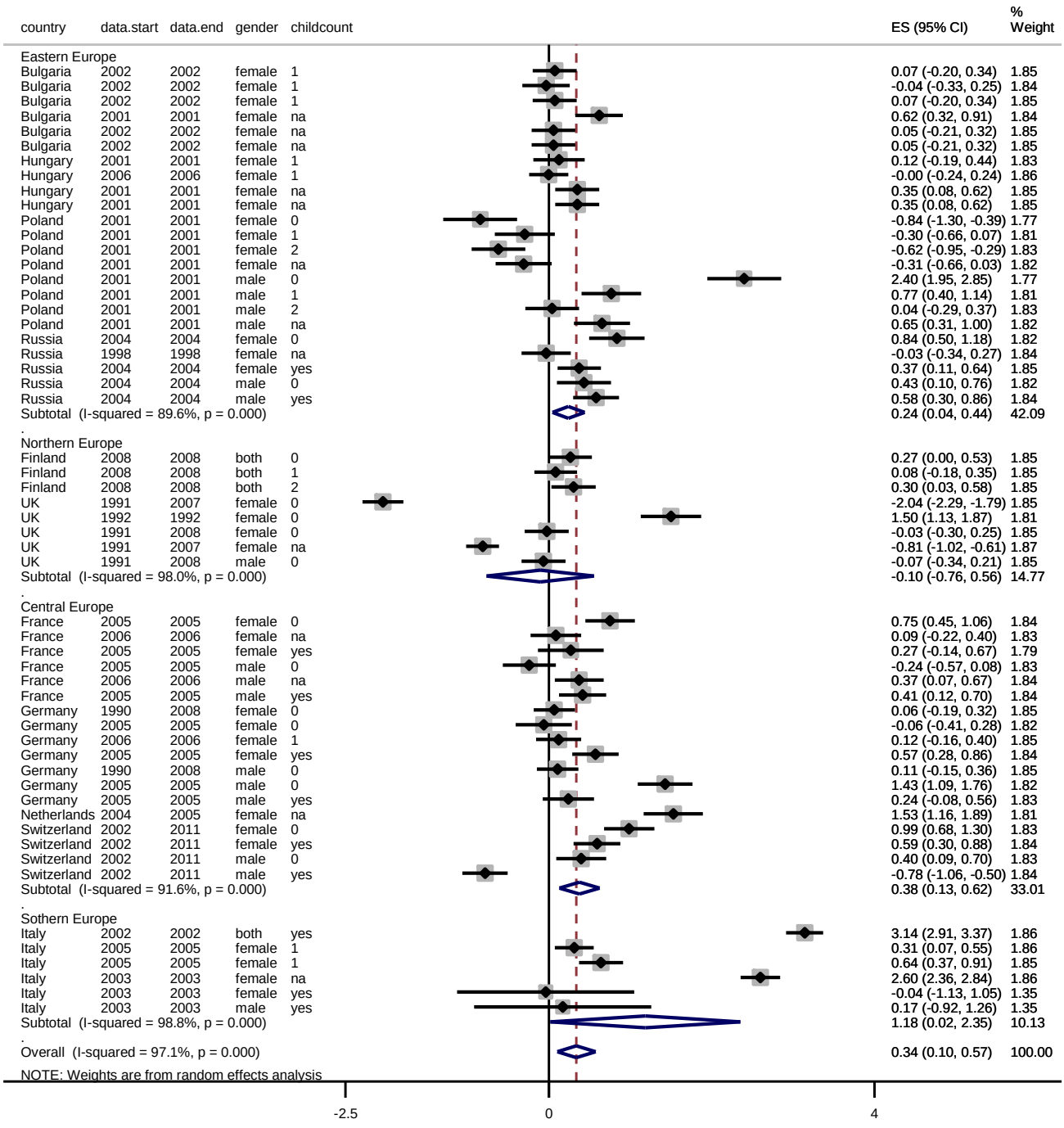

Table 2 Estimates from meta-regressions of the educational gradient of general fertility intentions in Europe. Studies published until the 1 January 2012

VARIABLES	M0	M1	M2	M3	M4
Midpoint of data interval		0.0171	0.00508	0.00923	-0.0203
		(0.0372)	(0.0382)	(0.0387)	(0.0391)
Female (1/0)			-0.305	-0.346	-0.432*
			(0.240)	(0.246)	(0.225)
Study stratified by parity (1/0)				-0.218	-0.215
				(0.273)	(0.250)
Nothern Europe					
(Reference is Southern Europe)					-1.494***
					(0.426)
Eastern Europe					-1.084***
					(0.365)
Central Europe					-0.930**
					(0.370)
Constant	0.338***	-33.91	-9.639	-17.77	42.33
	(0.111)	(74.60)	(76.61)	(77.56)	(78.36)
Observations	59	59	59	59	59
Inter-study variance	0.651	0.661	0.654	0.658	0.533
Imporvement of Inter-study variance compared to model without covariates (Pseudo R^2)	0.0%	-1.5%	-0.5%	-1.1%	18.1%
Regions	11	11	11	11	11
Papers	18	18	18	18	18
Start	1990	1990	1990	1990	1990
End	2011	2011	2011	2011	2011

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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