VIENNA INSTITUTE OF DEMOGRAPHY
Working Papers
1 / 2016

Maria Rita Testa, Valeria Bordone, Beata Osiewalska and Vegard Skirbekk

The Relation between Mother's Socio-Economic Status and Daughter's Fertility Intentions in Austria, Italy, Bulgaria, and Norway

Vienna Institute of Demography

Vienna Institute of Demography
Austrian Academy of Sciences
Welthandelsplatz 2 / Level 2
A-1020 Vienna · Austria
E-Mail: vid@oeaw.ac.at
Website: www.oeaw.ac.at/vid

ÖAW
Austrian Academy of Sciences

Abstract

Unlike actual fertility, fertility intentions are often found to be positively correlated with education. The literature explaining this paradox is scarce. We aim to fill the gap by searching for the main factors that compel highly educated women to still plan large family size. We hypothesize that this could result from the socioeconomic context surrounding the upbringing of those educated women. Using the first wave of the Generations and Gender Surveys for four countries (Austria, Bulgaria, Italy, and Norway), we analyse the relationship between mother's socio-economic status and daughter's fertility intentions, controlling for daughter's socio-economic status and sib-ship size. We found that the effect of family of origin is exerted mainly through the sib-ship size among childless daughters: Daughters with more siblings intend to have more children. After the transition to parenthood, the effect of family of origin is exerted mainly through the mother's level of education: Daughters with high-educated mothers intend to have more children. This result suggests that the positive link between reproductive intentions and level of education might not merely be an artefact generated by the design of cross-sectional surveys but the outcome of a better socio-economic status that allows forming more positive reproductive plans.

Keywords

Fertility, fertility intentions, education, socio-economic status, intergenerational values

Authors

Maria Rita Testa, Wittgenstein Centre (IIASA, VID/ÖAW, WU), Vienna Institute of Demography/Austrian Academy of Sciences and Vienna University of Economics and Business, Austria. Email: Maria.Rita.Testa@oeaw.ac.at

Valeria Bordone, Wittgenstein Centre (IIASA, VID/ÖAW, WU), International Institute for Applied Systems Analysis, Laxenburg, Austria. Email: Bordone@iiasa.ac.at

Beata Osiewalska, Cracow University of Economics, Department of Demography, Poland. Email: beata.osiewalska@uek.krakow.pl

Vegard Skirbekk, Norwegian Institute of Public Health, Olso and Columbia Aging Center at Columbia University, New York. Email: Vegard.Skirbekk@fhi.no

Acknowledgements

This work was supported by the Austrian Science Fund (FWF) under the Grant G22-V318, Elise Richter project "Reproductive decision-making and human capital". An earlier version of this paper was presented at the European Population Conference 2014. We would like to thank the participants for their comments.

The Relation between Mother's Socio-Economic Status and Daughter's Fertility Intentions in Austria, Italy, Bulgaria, and Norway

Maria Rita Testa, Valeria Bordone, Beata Osiewalska and Vegard Skirbekk

Introduction

Fertility intentions are the most proximate determinants of actual fertility (e.g., Barber 2001; Bongaarts 1992) and inform us about directional trends (Hin et al. 2011; Testa 2014). They are transmitted across generations from parents to children (Fernandez and Fogli 2006). However, the literature on intergenerational transmission of fertility has viewed the effect of the family of origin mainly in terms of sib-ship size; that is women with more siblings are likely to have more children (e.g., Murphy and Knudsen 2002).

In this paper we argue that young female adults may refer to their mothers' experience as a model—either to aim for or to be avoided—when forming their own fertility intentions.

More specifically, we test whether there are positive intergenerational effects of education on intended childbearing: the more children highly educated women have, the more children highly educated women in the daughter's (subsequent) generation will plan to have because they have witnessed how combining family and occupational career is a realistic life target for many women/mothers with high education. While such a link has already been investigated at the macro level (Testa 2014), there are no studies examining the micro-level relationship between mother's socio-economic status and daughter's fertility intentions. Our main research hypothesis is that daughters of a highly educated mother who worked during their teenage years are more able to reconcile a family life with children with an occupational career. Using cross-sectional data from the Generation and Gender Surveys (GGS) in a cross-country comparative approach, we examine the determinants of fertility intentions in Austria, Bulgaria, Italy, and Norway, four countries exhibiting quite different fertility levels, female labour market participation rates, welfare state models, and gender role systems. The importance of taking a comparative approach in studying intergenerational transmission of fertility has been widely acknowledged in the literature (Billari, Philipov, and Testa 2009; Liefbroer and Billari 2010; Keim, Klärner, and Bernardi 2009). Yet, existing research does not always account for cross-cultural and cross-national variations. The novelty of this analysis lies in the new dimension of intergenerational transmission, i.e. the work–fertility joint behaviour of mothers with adolescent daughters, which is considered in combination with the mother/daughter transmission of education and in a cross-country comparative approach accounting for different cultural and institutional settings.

Continuities in fertility-related outcomes between parents and children have consequences in terms of both population size and structure. Hence, it is particularly valuable to gain more knowledge about the intergenerational transmission of fertility.

The paper is structured as follows: after a review of the relevant literature on fertility intentions and intergenerational transmissions of fertility-related behaviour, similarities and differences of four European countries in terms of both institutional context and labour market are examined. Next, data and methodology are presented and, finally, results are described and critically discussed in the concluding section.

1 Background

This study lies at the intersection between those asserting a strong link between intentions and behaviours, as in the *theory of planned behaviour* (Ajzen 1991), and those arguing that parental behaviour and parent-child relationship during childhood and adolescence significantly influence both intentions and behaviours of children in adulthood, as in the *principle of linked lives* theoretical frame (Elder 1977, 1994).

The concept of *intention* refers to a commitment to act, which incorporates possible obstacles and contingent circumstances. As such, intentions reflect plans under given constraints and circumstances (Miller and Pasta 1995; Thomson 1997) and are immediate antecedent of corresponding behaviour (Ajzen 1991, 2005; Ajzen and Fishbein 1980; Fishbein and Ajzen 2010). The intentions to perform a behaviour (fertility in this study) are determined by personal factors (i.e., attitudes related to the perceived benefits and costs of reproduction), social influences (i.e., subjective norms on social approval from relevant others), and an individual's perception of their ability to perform such a behaviour (i.e., perceived behavioural control) (see, for example, Iacovou and Tavares 2011). Empirical studies in the fertility domain have shown that all three factors—attitudes, norms, and perceived behaviour control—influence reproductive intentions and behaviour, although attitudes and norms are more relevant at the beginning of the reproductive career while perceived control plays a stronger role after the birth of the first child (e.g., Billari, Philipov, and Testa 2009; Mills et al. 2008; Testa and Grilli 2006).

A crucial issue is whether and to what extent women are able to predict constraints when formulating their intentions. Elder's concept of "linked lives" (Elder 1977, 1994) points to the fact that family members' lives are interdependent. Individual actors affect each other through their behaviour and children are often presumed to take after their parents. Hence, intentions may arise from the family of origin domain, and in particular we argue that observing and learning from the mother's experience may contribute to form fertility intentions of adult daughters.

A wide array of studies has shown that mothers serve as significant others from which daughters learn. Moreover, mothers are one of the main providers of immediate care, advice and social support on reproductive issues for young women (Chan and Elder 2000; Dubas 2001; Pollet, Nelissen, and Nettle 2009). Yet, to our knowledge, so far no study has focused on mother's socio-economic characteristics as predictors of the daughter's fertility intentions, a topic we are going to address below.

The literature on intergenerational transmission of fertility has mainly derived from *socialisation* studies, asserting that family (-size) values formed in late childhood and early adolescence are retained throughout life (e.g., Westoff and Potvin 1967). More generally,

socialisation theories (Acock and Bengtson 1980; Glass, Bengtson, and Dunham 1986; Starrels and Holm 2000; Thomson 1992) argue that parents transmit their cultural orientations to their children both directly and indirectly, early in life as well as across the life course. The direct transmission is through parents purposefully teaching children; while imitation of the parents is an indirect mechanism through which children learn from the older generation. The positive correlation found in intergenerational transmission of fertility intentions (e.g., Kotte and Ludwig 2011) and behaviours (e.g., Liefbroer and Elzinga 2012; Murphy and Wang 2001) across successive generations has been explained with these mechanisms. Such a model of intergenerational transmission has been questioned by the rational choice approach (Kahn and Anderson 1992), and alternative theories of socialisation have also been proposed. Easterlin (1980), for example, suggested a negative relationship between the fertility of successive generations, based on a better economic condition of children born into small birth cohorts. Moreover, genetic studies stressed the importance of inherited and environmental factors in explaining mother–daughter similarities in fertility intentions and behaviours (e.g., Kohler, Rodgers, and Christensen 1999; Rodgers and Doughty 2000). Despite different assumptions, social science approaches tend to converge in highlighting the role of early family socialisation environment in intergenerational transmission of fertility intentions. Deriving from the previous literature on intergenerational transmission of fertility, it is expected that *mother's number of children is positively associated with daughter's intended family size* (H1).

It is also worth noticing that several studies have documented a positive relation between mother's and daughter's education in different countries and periods (Kye 2011; Mare and Maralani 2006; Matras 1961).

1.1 Human Capital and Fertility Intentions

Becker's *new home economics* (e.g., Becker 1981) derived a negative effect of female education on fertility from the positive association between education and labour force participation because it considered opportunity costs to be more important among the highly educated. The effect of a woman's education on her own fertility intentions is, however, quite complex and does not necessarily reflect the association between actual fertility and education insofar as highly educated women are not able to anticipate the negative effect of postponement on their reproductive careers. Moreover, over three decades ago, Folbre (1983) argued that fertility theory should take into account power relations within the household. Since then, several studies have indicated women's human capital (commonly measured by their educational attainment) as a proxy of the bargaining power of the woman within the household (e.g., Mills et al. 2008). Higher levels of education allow women to question traditional roles (McDonald 2006) and are often associated with a more equal gender division of household chores (e.g., Mencarini and Tanturri 2004).

Fertility intentions are recognised as an important channel through which education affects fertility. Yet, several studies have found that, unlike in developing countries, European women who invest more in education do not necessarily intend to have a smaller family size than their less educated counterparts (e.g., Testa 2014; see also Esping-

Andersen 2009; Kravdal and Rindfuss 2008). Indeed, because of their ability to break traditional roles, to achieve more gender equality in the division of household labour, and to attain higher economic assets, highly educated women may have better opportunities to balance work and family (Gauthier 2007), and therefore they may even tend to plan more children than women with low education. Following this line of research, we anticipate *a positive association between daughter's level of education and daughter's number of intended children* (H2).

In addition, the educational level of significant others, especially the mother, contributes to the formation of a daughter's fertility intentions. It may operate through social learning—the transmission of knowledge and attitudes from others by communication and observation—or social influence, eliciting a more passive imitation of others' behaviour driven by a desire to obtain their approval or to avoid sanctions (e.g., Bongaarts and Watkins 1996; Montgomery and Casterline 1996; Kohler, Behrman, and Watkins 2001). Indirect evidence for this can be found, for example, from previous results of an effect of significant others' education on contraceptive use among women in developing countries (e.g., Moursund and Kravdal 2003). Furthermore, an early study by Hirsch, Seltzer, and Zelnik (1981) showed a positive relationship between the educational attainment of the parents or childraisers and the desired family size of teenage women in the USA. Moreover, a mother's higher socio-economic status normally implies that she enjoys healthier and wealthier conditions, which in turn are translated in stronger potential support to her daughter(s) in terms of monetary transfers, emotional support, and provision of help, circumstances that may favour daughter's reproductive plans (Tanskanen and Rotkirch 2014). Thus, we expect *a positive association between mother's level of education and daughter's number of intended children* (H3).

Previous research (Testa 2014) suggested that there might also be feedback spillover effects between education and fertility of older women on the one hand, and education and intended fertility of younger women on the other. Following this argument, it could be anticipated that the fertility intentions of daughters are affected by whether their mothers were working (and had children) when they were teenagers. Women who during their teenage years experienced their mothers working learned from their mother's experience and formed reproductive intentions in a different way compared to peers whose mother was at home. As posed by Iacovou and Tavares (2011, 93) "people learn from their observations of the world, from the experiences of their contemporaries, from their own changing circumstances, and from insights into their personalities". This could, however, lead to both directions of association, depending on whether the mother was herself able to successfully balance family and career as well as transmit this positive model to the daughter. Lacking information on the mother's performance in work–life balance, and in light of the notion that increasing female labour force participation is associated with declining fertility if gender role attitudes within the family are not egalitarian (McDonald 2000), maternal employment could be seen as a promoting factor for egalitarian gender role attitudes at the individual level. Based on the social learning theory, a wide range of literature has shown that working mothers are more likely to transmit egalitarian attitudes and work-related attitudes to their daughters (e.g., Bolzendahl and Myers 2004; Fan and Marini 2000). Hence, it can be expected that *women who had their mothers working during teenage years have a higher intended number of children than their counterparts with a mother who was at home*

(H4). The inheritance of the double-burden model encompassing both family and child care duties is a crucial mechanism behind this association. Other possible mechanisms, which would act indirectly, may be related to the predisposition to select a partner more prone to help in household and childcare tasks.

1.2 A Cross-Country Comparison

Four European countries are considered: Norway from Scandinavia, Austria from central Europe, Italy from the Mediterranean, and Bulgaria among the eastern European countries. These countries differ in terms of economic opportunities and employment levels, welfare systems, and family policies which also may have implications on cross-national differences in fertility levels. For this reason, they offer a good case for comparative study. We could not enlarge this comparative setting to other countries whose data were available in the Generation and Gender Program either because the question on mother's occupational status was not collected in a reliable way in the survey questionnaire, or because the other key variables of our analysis contained an unacceptable amount of missing values.

Table 1 reports female employment rates for all four countries between 1960 and 2000. Two aspects are worth being highlighted: first, the large increase in the proportions of employed women in each country over the whole period; second, the persistent cross-country differences in the level of female employment which are still remarkable in the most recent year. The Italian female employment rate has been almost half of that in Norway, at least since 1980. The 2010 data show that about 73% of Norwegian women between 15 and 64 are working, while in Italy this percentage is only 46%, one of the lowest in Europe (Del Boca and Vuri 2007). Austria and Bulgaria have an in-between position, with about 66% and 56% of women aged 15–64 employed, respectively.

Table 1: Female employment rates (age 15-64), 1960-2010

	1960[d]	1980 [d]	2000 [d]	2010[e]
Austria	55.2 [a, f]	52.4	59.3	66.4
Bulgaria	33.5 [b, g]	66.5 [c]	46.3 [b]	56.4
Italy	28.1	33.2	39.7	46.1
Norway	26.1	58.4	73.4	73.3

Source: d) Pisarrides et al. 2003; e) data downloaded from Eurostat. (http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do) on 20 October 2014; f) Lupri 1983; g) Kaser 2008.

A similar pattern of differences could be observed in recent fertility levels which are highest in Norway (where the total fertility rate –TFR– is equal to 1.85) and lowest in Italy (TFR= 1.43), with an intermediate position for Bulgaria (TFR = 1.5). Austrian fertility level is close to that of Italy (1.44) (Scherbov et al. 2014).

The size of the service sector explains partly the between-country differences in female labour force participation (Saraceno 1997) as it is a disproportionately large sector in the labour market for women. Indeed, Italy—the country with the lowest female employment rate in our comparative framework—is also characterised by a small service

sector, low percentages of women working part-time, and high unemployment rates (D'Addio and Mira d'Ercole 2005). Moreover, gender equity in the family and in public provisions for the family remains limited, as in other Mediterranean countries (Del Boca and Rosina 2009; McDonald 2000; Mencarini and Tanturri 2004; Mills et al. 2008). The Italian context, based on a "familistic" welfare system and relying on a central role of the woman as principal caregiver (Esping-Andersen 1999), is also characterised by a rigidity in the labour market that simultaneously increases the costs of having children and discourages labour market participation of married women (Del Boca 2002).

By contrast, Norway is characterised by a generous family policy and a large service sector. The supportive Scandinavian welfare based on individual independence and collective social solidarity pioneered the transformation of parenthood into political issues, incentivising women's continuous employment and enabling parents (men as well as women) to combine parenthood with paid work (Lappegård 2010). As in the other Scandinavian countries, Norway's generous and egalitarian policies for parental leave and the large supply of part-time jobs with extensive social benefits, subsidised day care facilities, flexible working hours, and economic support to families with children contribute to both female employment and childbearing. Norway, however, represents a more dualistic family policy than other countries and is ranked high on policies that give both dual-earner support and policies that give more general family support (Ellingsæter and Leira 2006).

In Austria, tax and benefit policies have long discouraged married women's participation in the labour market (Morgan 2006). Until at least the 1980s, the social democratic party leaned toward the male-breadwinner model and did not produce policies encouraging mothers' employment. More recent flexible working-time arrangements allowed women to combine work and family life. Part-time is the main option to combine work and family life. According to the 2001 European Labour Force Survey, more than 40% of Austrian women working part-time reported the ability to look after children or elderly family members as a reason for preferring this work arrangement.

In Bulgaria, similarly to Italy, women have a central role within the family, but other than in Italy and similar to Norway, the dual-breadwinner model is far more present (Naldini 2003). The female employment rate in Bulgaria has been very high compared to the other European countries, with a peak in mid-1980s, but it declined in subsequent decades because of increasing unemployment, especially for the youngest and most educated (Genov and Krasteva 2001).

Based on these cross-country differences, it can be expected that *the socio-economic status of the mother plays a more important role on daughter's fertility intentions in those countries with limited institutional support to families with children and low persistent female employment rate in the mother's generation (H5).* The idea is that in such contexts daughters do not learn the skills required for combining work and family life by the examples of (their or others') mothers.

2 Data and Method

2.1 Data and Sample

We used data from the GGS, carried out from 2002 as part of the Generation and Gender Programme (GGP, www.ggp-i.org) in 19 countries. The GGS is a set of comparative surveys on childbearing, partners, parents, work, and everyday life. It includes several questions concerning relations between generations, as well as a section dedicated to the characteristics of the respondent's family of origin. Data for Italy were collected in 2003, while the survey was conducted in Bulgaria in 2004, in Austria in 2008/2009, and in Norway in 2007/2008. We restricted the sample to women of reproductive ages (18–49).

After this selection, the working sample consisted of 12,606 women aged 18 to 49 for which information about their mothers was available. We selected only the daughter-mother sample because our focus is on the transmission models across female generations. Non response rate to the question on mother's occupational status was low (3%). Fertility intentions questions were answered by the large majority of interviewed daughters (93%). Interestingly, previous literature has shown that the daughter–mother link is the most relevant one in the intergenerational transmission of fertility (Tanskanen and Rotkirch 2014), and that (grand)mothers play a crucial role in (grand)childrearing activities (Coall and Hertwig 2010; Mace and Sear 2005).

The intention to become a parent (parity zero) marks a crucial transition in one's life whereas intentions of higher parity transitions (to second or higher birth order child) are qualitatively different and strongly affected by the experience of parenthood (Dommermuth, Klobas, and Lappegård 2011). Therefore, the analysis was stratified by parity, with 4,215 childless daughters and 8,391 daughters with at least one child.

2.2 Measures of Fertility Intentions and Explanatory Variables

The dependent variable, intended number of children, was measured through the following survey questions: "*Do you intend to have a(nother) child in the next three years?*" and "*Suppose you do not have a(nother) child during the next three years, do you intend to have any (more) children at all?*". The response options were in both cases: "*Definitely yes, probably yes, probably not, definitely not*, and *does not know*". Out of these two questions, we computed a binary variable measuring the intentions to have a(nother) child at all, which is equal to 1 if the respondent intends to have a(nother) child (either definitely or probably and regardless of whether within three years or a longer period), and 0 otherwise. This variable is the outcome of the zero component of the Zero-Inflated Poisson (ZIP) model used in the analysis (see next section on modelling).

In addition, if the intention was not negative (either "probably" or "definitively" was answered to one of the two questions on childbearing intentions), the following question was asked: "*How many (more) children in total do you intend to have?*" Respondents were required to indicate a numerical answer that could also be zero. This variable on the additionally intended number of children ranging from 0 to 8 is the

outcome of the count component of the ZIP model (see next section on modelling).

The key explanatory variables are the following:

i) Daughter's number of siblings, coded as a categorical variable equal to 0 if the woman is a single child, 1 if she has one brother or sister, 2 if she has two siblings and 3 if she has three or more siblings.

ii) Daughter's educational attainment, the original 6 ISCED categories were grouped into low (ISCED 0-2 = pre-primary; primary; lower secondary); medium (ISCED 3-4 = upper secondary; post-secondary, non-tertiary – reference -); and high (ISCED 5-6 = tertiary) educational attainments.

iii) Mother's educational attainment, also coded in three categories as for the daughter (here the reference category is low education).

iv) Mother's occupational status when the daughter was 15 years old. The survey question was worded as follows: "*What was your mother's occupation when you were 15?*" The possible answers were based on the ISCO-88 classification, designed by the International Labour Organization (ILO, www.ilo.org). We created a binary variable coded 1 if the mother was "working" and 0 otherwise.

v) Country dummies have been included in all models to control for the different socio-economic and cultural contexts. Additionally, all interactions between mother's characteristics and country have been tested and retained in the final models whenever significant.

Control variables include: age, marital status, employment status, and living arrangements. They are all referring to daughter's characteristics at the time of interview. Age was grouped into six categories: 18–24, 25–29, 30–34 (reference), 35–39, 40–44, and 45–49. Marital status was coded into four categories: married (reference category), single, partnered but not married, and divorced or widowed. Employment status was included as a four-categorical variable: employed (reference), unemployed, not active and enrolled in education. Since the characteristics of the mother and the influence the mother has on her daughter's intentions may depend on living arrangements, we additionally considered whether the respondent lived with the parents and, if not, the time since respondent had left parental home. Three dummies were computed and included into the models: "daughter lives with parents"; "daughter has lived separately from her parents for less than six years"; "daughter has lived outside her parental home for 6 years or more" (reference).

The full distribution of the variables used in the regression analysis by parities and countries are reported in Table 2. In the country pooled dataset, the two-child family is the most frequently reported intended family size among childless daughters (53%), while 18% of daughters with one or more children intend to have at least one additional child (12% one, 5% two, and 1% three or more children). The highest share of daughters has one sibling: 48% in the childless sub-sample and 39% in the higher parity group. In the first sub-sample, the range goes from about 40% in Austria and Norway and more than two-thirds in Bulgaria; in the latter, the range goes from 27–28% in Austria and Norway

to 58% in Bulgaria. Only a minority of daughters are a single child (12% among those childless and 9% among those with children). Remarkably, 27% of daughters in parity one and above have three or more siblings whereas only 16% of childless daughters have such large families of origin.

Most of the daughters have a medium level of education in both zero parity and higher parity samples (50% of those childless and 51% of those with children) and in the country samples. The only exception is Norway where the majority of daughters—46%, regardless of whether childless or with children—are highly educated. Around two-thirds of daughters are employed and a substantial proportion of them are still enrolled in education if childless (27%): These percentages range from one-quarter to one-third depending on the country considered.

Sixty-five percent of childless daughters are in the youngest age groups between 18 and 29 years, while 42% of daughters with children are aged 40 and above. More than half of childless daughters are single and about one third are partnered but not married, while 12% are married. By contrast, among daughters with children the large majority (76%) are married. Yet, a substantial proportion of partnered but not married daughters can be observed in Austria (23%) and Norway (25%). Most daughters (88%) in the parity one and above sub-sample have left the parental home for 6 or more years, but in the childless sub-sample more than 70% of daughters in Bulgaria (79%) and Italy (70%) still live with their parents.

Most of the mothers (45%) in the parity zero sample have a medium level of education, while they are low educated (56%) in the one of higher parity, with the exception of Norway, where 50% of the mothers of parity one or above daughters are middle educated. About 70% of the mothers in both parity sub-samples were working when the daughter was a teenager. Italy takes an exceptional position with 72% of mothers being low-educated in the sample with parity zero and with most of the mothers not working when the daughters were teenagers, 55% for parity zero and 64% for parity one and above.

Table 2: Descriptive statistics of variables used in the regression. Values in per cent. N=4,215 childless daughters and 8,391 daughters with children

	PARITY ZERO					PARITY ONE AND ABOVE				
	AT	BG	IT	NO	All	AT	BG	IT	NO	All
Fertility intentions										
No-child	19	10	22	23	19	75	84	82	83	82
One child	12	22	14	3	13	16	10	14	12	12
Two children	54	62	50	47	53	6	6	3	4	5
Three or more children	15	6	15	27	15	2	1	1	1	1
Mother's characteristics										
Education										
Low	31	19	72	21	38	56	51	90	35	56
Medium	58	57	22	46	45	41	39	9	50	36
High	11	24	6	33	18	4	10	1	15	8
Occupational status										
Working	65	93	45	80	70	55	92	36	74	68
Not working	35	7	55	20	30	45	8	64	26	32
Daughter's characteristics										
Number of siblings										
No sibling	9	17	15	5	12	7	12	10	3	9
One sibling	39	69	45	39	48	27	58	33	28	39
Two siblings	30	9	25	35	24	26	17	25	35	25
Three or more siblings	22	5	15	21	16	40	13	33	34	27
Education										
Low	10	16	22	17	17	16	20	42	15	23
Medium	67	57	60	37	55	69	53	47	39	51
High	23	27	18	46	28	15	27	11	46	26
Employment status										
Employed	70	49	57	64	60	67	66	61	82	69
Unemployed	5	17	11	1	9	4	21	3	1	9
Not active	2	2	8	3	4	28	13	36	13	21
Student	23	32	24	32	27	1	0	0	3	1
Age										
18-24	40	55	31	40	41	3	5	1	2	3
25-29	28	21	21	27	24	11	14	6	7	10
30-34	13	11	16	15	14	19	22	16	17	19
35-39	8	7	14	7	9	27	22	26	30	26
40-44	9	4	11	7	8	34	25	27	30	28
45-49	2	2	7	4	4	6	12	24	14	14
Marital status										
Married	10	8	19	9	12	68	80	92	64	76
Single	36	63	50	58	52	4	3	2	6	4
Cohabiting	52	29	29	32	36	23	10	3	25	15
Widowed or divorced	1	0	2	1	1	5	7	3	5	5
Living arrangements										
Living with parents	41	79	70	19	54	3	13	4	1	6
Left parental home <6 years	20	9	10	23	15	5	7	9	1	6
Left parental home 6+ years	40	12	20	58	31	92	80	88	98	88
N	1,032	1,066	1,199	918	4215	1,666	2,920	1,759	2,046	8,391

Source: Authors' elaboration based on GGS: 2003 Italy, 2004 Bulgaria, 2008/2009 Austria, and 2007/2008 Norway.

2.3 Zero-Inflated Poisson Model

We used a ZIP model to estimate the predictors of women's fertility intentions. This model is suitable for outcome variables that have a count nature, as in the case of the intended number of children, but that at the same time are likely to have many zeros— not all individuals intend to have children (Osiewalska 2013). The ZIP model encompasses two components that correspond to different zero generating processes. The first process is governed by a binary distribution (with the probability of occurrence equal to *p*) that generates structural zeros. The second process is governed by a Poisson distribution that generates counts, some of which may also be zero. As such, those zeros, in accordance to the standard Poisson distribution, are 'expected' and also called *Poisson* or *imperfect zeros*, while the others are 'unexpected' and also called *perfect zeros* (e.g., Lambert 1992). In our case, perfect zeros derive from the clear intention not to have a(nother) child (e.g., because of infecundity); while imperfect zeros are related to women who hesitate on the intention to have a child/additional children (that is women who would like to keep open the possibility to start or enlarge the family, but still answer "zero" for example because they are negatively oriented toward additional childbearing).

Hence, ZIP is a statistical model (one distribution) which simultaneously fits two separate regressions. This means that the model has two states: The "zero state" is the regression for probability *p* of being in *perfect* state, most commonly a logistic regression; while the "count state" is the standard Poisson regression with expected value equal to λ. These two regressions are connected by the probability (1-*p*). The formula for the ZIP model, assuming *n* independent variables Y_i (i = 1, 2, …, n) can be represented as follows:

$$P(Y_i = y_i) = \begin{cases} p_i + (1 - p_i)\exp(-\lambda_i), & y_i = 0 \\ (1 - p_i)\exp(-\lambda_i)\dfrac{\lambda_i^{\,yi}}{y_i!}, & y_i = 1,2,..., \quad p_i \in [0,1]. \end{cases}$$

The regressions, both for zero and count states, are included in the following form:

$$p_i = \frac{\exp(x_i\gamma)}{1 + \exp(x_i\gamma)}, \qquad \lambda_i = \exp(\omega_i \delta),\ i = 1, \ldots, n,$$

where x_i and ω_i are vectors of covariates and γ and δ are vectors of parameters. The coefficients estimated in the zero state should be interpreted as in a standard logistic regression (log of odds ratio), while the coefficients estimated in the count state have the same interpretation as in a standard Poisson regression (logarithmic transformation of lambda).

We selected the ZIP model for two main reasons. First, the no-child intention may have different meanings: It can be a deliberate decision to remain childless or stop childbearing because the intended family size is completed, or the result of an "inability" to have children, for example due to infecundity. This aspect is taken into account in the model which treats the identical outcome (i.e., zero) as a result of these two different processes. Second, the ZIP model takes into account that positive fertility intentions (i.e., the intention to have a(nother) child) are different from negative fertility intentions (i.e., the intention not to have a(nother) child)[1] because they require different actions and have different levels of predictive accuracy of actual fertility (Miller 2011). Nevertheless they are correlated; if a person has a probability of not intending a child which is equal to *p*, the intended number of children depends also on the probability 1-*p* of intending a child. This implies that the two sets of regression coefficients are interdependent and are not merely equal to the coefficient parameters coming from two separate models, i.e., the logistic regression model and the Poisson regression model run on the same sample. This circumstance offers us a convincing argument to use this complex and less parsimonious models instead of the conventional logistic and Poisson regression models.

We run four models, differing from each other in that Model I includes the number of siblings and education of the daughter, Model II adds to Model I a control for mother's education, Model III adds to Model I a control for mother's occupation at daughter's teenage, and Model IV considers both mother's education and mother's occupation and adds interaction effects between mother's education and country and between daughter's education and country. Interactions were included to see whether mother's education had a different effect in different countries. Interaction effects were retained only where significant in at least one of the two parts – zero or count – of the models for the sake of model parsimony.

3 Results

3.1 Descriptive Analysis

Table 3 reports, separately by parity (zero; one or above), the percentages of daughters intending a(nother) child (upper part), as well as daughters' mean intended family size (bottom part), by daughter's and mother's level of education and by country. The large majority of childless daughters intend to have at least a first child (81% of parity zero daughters in the pooled sample report to intend a child) but only 18% express the intention to have a(nother) child if they have already one or more children at the time of the survey. The mean intended family size is 1.67 among childless daughters and 2.19 among daughters with children in the pooled dataset (the first ranging between 1.64 in Bulgaria and 1.68 in Norway and the second between 2 in Bulgaria and Italy and 2.45 in Norway). The difference (around 0.5 children) between the two sub-groups is likely to be artificial, i.e., due to the higher number of ever born children in the parent sub-sample than in the childless sub-sample, because here the intended family size is calculated as the sum of children already born plus those intended for the future (i.e., complete family size). Differently, in the outcome variable of the regression models (Models I-IV, Table 4 in the appendix) only the planned component of the family size is considered, while the component of family size related to the children already born is controlled for by stratifying the analysis.

[1] The properties of the ZIP model allow us to estimate the effects of covariates controlling for whether this effect is related to the perfect or the count state (binomial or Poisson distribution).

The percentage of daughters intending to have any (more) children increases with daughter's and mother's educational attainment. For daughter's education, among childless women, the increase takes a reversed U-shape in Austria and Italy, is U-shaped in Norway, and monotonic in Bulgaria. The increase is also monotonic in all countries among women with at least one child. For mother's education, the increase is monotonic in all countries and in both parity sub-samples (except for Italy in parity one and above, where it takes a reversed U-shape).

Among childless daughters, the relationship between mean number of intended children and level of education has a reversed-U shape, with daughters with medium level of education showing the highest values. This pattern does not hold true in the Norwegian sample where a monotonic negative relation is observed. In the parity one or more sub-sample, the mean number of intended children declines with daughter's level of education; such a decrease is monotonic in the pooled dataset as well as in Austria and Bulgaria, but slightly U-shaped in Norway.

As in the case of daughter's education, the relationship between mother's education and daughter's intended number of children takes divergent patterns in the childless and parity one or above sub-groups. The mean number of intended children increases with mother's education level among childless daughters, and decreases with mother's education level among daughters who have already children. The increase in parity zero is monotonic (with the exception of Bulgaria where the relationship takes a slightly reversed U-shape). The decrease in the higher parity samples is monotonic in Austria, whereas in Bulgaria and Norway the lowest number of intended children is reported by daughters with a medium-educated mother. Unlike other countries, in Italy the mean intended family size increases with mother's educational level in both parity sub-groups, zero and higher.

Table 3: Fertility intentions by daughter's and mother's level of education. Parity zero (0 child) and parity one and above (1+ children).

	Austria		Bulgaria		Italy		Norway		All countries	
	Intending any (more) children (%)									
Parity	0	1+	0	1+	0	1+	0	1+	0	1+
Daughter's education										
Low	70	22	86	13	69	13	81	15	76	15
Medium	83	25	90	14	82	21	74	15	83	18
High	80	26	91	23	75	24	77	18	81	23
Mother's education										
Low	75	22	79	9	75	17	65	13	74	14
Medium	83	28	92	23	85	27	76	15	85	23
High	84	38	93	31	91	25	85	27	88	30
Total	81	25	90	16	78	18	77	16	81	18
	Number of intended children (Mean)									
Parity	0	1+	0	1+	0	1+	0	1+	0	1+
Daughter's education										
Low	1.51	2.77	1.61	2.52	1.38	2.03	2.03	2.52	1.61	2.47
Medium	1.73	2.37	1.66	1.90	1.70	1.97	1.79	2.43	1.71	2.14
High	1.63	2.35	1.62	1.85	1.51	1.97	1.74	2.44	1.61	2.12
Mother's education										
Low	1.60	2.47	1.43	2.12	1.51	1.99	1.50	2.50	1.51	2.25
Medium	1.67	2.40	1.69	1.88	1.75	1.99	1.76	2.40	1.72	2.13
High	1.97	2.27	1.67	1.89	1.93	2.21	2.07	2.49	1.90	2.18
Total	1.68	2.43	1.64	2.00	1.59	2.00	1.81	2.45	1.67	2.19
N	1,032	1,666	1,066	2,920	1,199	1,759	918	2,046	4215	8,391

Source: Authors' elaboration based on Generation and Gender Surveys: 2003 Italy, 2004 Bulgaria, 2008/2009 Austria, and 2007/2008 Norway.

3.2 Regression Analysis

Table 4 (see in the Appendix) reports the estimates of ZIP models run separately on childless daughters and daughters with children. Data for all the four countries were pooled together and country dummies were included in the models. Panel *a)* of Table 4 shows the estimates of the zero part of the model, i.e., the effects of the explanatory variables on the intention not to have a(nother) child. Estimates are given in odds ratio, thus values greater than 1 indicate a positive effect of the covariate on the no-child intention, holding all other variables in the model constant, and values smaller than 1 are suggestive of a negative association. Panel *b)* of Table 4 reports the estimates of the count part of the model, i.e., the effects of the explanatory variables on the number of intended children expressed in risk ratio; thus, values greater than 1 indicate a probability to prefer a larger family size, holding all other variables in the model constant, and values smaller than 1 are suggestive of intentions of a smaller family size. In the following, results are presented in parallel for the zero and the count parts of the model whose estimates are reported in panel *a)* and panel *b)*, respectively, of Table 4. We comment the results following the order of our hypotheses.

The *number of siblings* does not significantly influence the zero-child preference but is positively and statistically significantly associated with daughter's intended number of children. There is no difference between daughters with no siblings and those with one. However, daughters with two and those with three or more siblings are more likely to plan a larger family size than their counterparts with only one brother or sister (the risk ratio is slightly below 1.2 in all the models for both the childless sub-sample and the higher parity sub-sample). The effect is stronger for the childless than for the higher parity sub-sample. In the latter sub-sample, there is statistical significance only in Models II and IV, where we control for mother's education.

Daughter's education is statistically significantly associated with both the intention of zero children (negatively) and the intended family size (positively), as suggested by the descriptives. Although the direction of these associations is the same in both parity sub-samples, o nly in the parity one or above sub-sample are they highly statistically significant (e.g., odds ratio equal to 0.59 for high-educated as compared to middle educated daughters in Model IV of panel *a)*; risk ratio equal to 1.43 for high-educated as compared to middle educated daughters in Model IV of panel *b)*).

Although *mother's occupational status* when the daughter was a teenager is not statistically significantly associated with neither the no-child intention nor with a given intended family size, *mother's education* has a negative effect on the probability of having a zero-child preference (e.g., odds ratio: 0.54 in full model –Model IV– of panel *a)*) and a positive one on the number of intended children (risk ratio: 1.39 in Model IV of panel *b)*). This association is statistically significant only in the sub-sample of daughters with children, but the direction holds similar in the parity zero sub-sample.

Country effects show that childless daughters are less likely to report a preference for a no-child family in Italy than in Austria (the odds ratios are about 0.4 and 0.5, respectively, in all the models of panel *a)* for parity zero), and consistently, they have a higher probability of intending a larger family size in Italy than in Austria (risk

ratio equal to 1.1 in the models of panel *b)* for parity zero). In the higher parity sub-sample, the situation is different: Bulgaria and Norway are the countries showing the highest odds ratio of no-child intention (3.62 and 1.97, respectively, in the full model of panel *a)*) and the lowest risk ratio for a given family size (0.50 and 0.63, respectively, in the full model of panel *b)*).

Among the control variables, age has a statistically significant effect on both the zero-child intention and the total number of intended children, the first effect being positive and the second one negative. The negative relationship between age and intended family size is in line with the life course approach and the interpretation of fertility plans as a moving target (Lee 1980), and goals that are readjusted over the individual's life course (Liefbroer 2009; Iacovou and Tavares 2011). The positive relationship between a zero-child intention and age is consistent with studies documenting the existence of age norms related to childbearing (Billari et al. 2010). The extremely high odds ratio for no-child obtained in the age groups 40–44 and 45–49 are an indication of the presence of biological limits to reproduction (declining fecundity). For the parity zero sub-sample, being single increases the likelihood of zero-child intentions by a factor of about 2.9 and decreases the expected number of intended children by a factor of 0.85; while being single does not significantly influence fertility intentions of daughters who already have children. This finding is in line with research showing the importance of being in a partnership for stating positive fertility intentions (Testa and Toulemon 2006). Only for parity one and above, being partnered but not married significantly decreases the likelihood of a no-child intention by a factor of 0.5 as compared to being married, while it significantly increases the expected number of intended children by a factor of 1.4. This finding is consistent with prior research documenting a positive effect of cohabitation on fertility intentions especially when cohabiting is considered as a prelude to marriage (Hiekel and Castro-Martín 2014).

Being not active in the labour market has a strong positive effect on the preference for a no-child family (the odds ratio is about 4 in all the models of panel *a)*) and a depressing effect on the number of intended children (the risk ratio is almost 0.8 in the models of panel *b)*) for parity zero. Living arrangements also show some statistically significant effects; childless daughters having left the parental home less than six years ago have a lower probability of reporting zero-child intentions than daughters who left the parental home six or more years ago (the odds ratio is 0.6 in panel *a)*). A similar result is obtained also for daughters at parity one and above. Moreover, in this latter sub-sample still living with the parents is also statistically significantly associated with a lower preference of not having another child. Finally, daughters with children who still live with their parents or have left the parental home since less than six years are more likely to intend to have a larger family as compared to their counterparts who left parental home since six or more years (risk ratios equal 1.53 and 1.33 respectively in panel *b)*).

In line with the regression estimates, no relevant educational differences were found in the probability of intending no-child among childless daughters. This result held irrespective of whether daughter's or mother's education was considered. By contrast, at parity one or above, the zero-child preference was less likely among highly educated daughters as well as among daughters of highly educated mothers, especially in Austria and

in Italy (Figure 1, panel *a)*). In the case of mother's education, the contrast was mainly between low and medium education on one hand and high education on the other hand.

In all four countries highly educated daughters were found to expect a higher number of intended children. The educational differences were more remarkable in the childless sub-sample than in the sub-sample of daughters with one or more children. In this latter case, the differences in the expected number of intended children by daughter's education and, to a lesser extent, by mother's education were observed especially in Austria and Italy (Figure 1, panel b)).

The highest probability of zero intended child were found in Austria and Norway, the lowest ones in Bulgaria and Italy at parity zero. At parity one and above the highest probability of zero intended child were found in Bulgaria and Norway while the lowest ones were observed in Austria and Italy. The smallest intended number is predicted for (low educated in) Austria, consistent with previous findings (Goldstein, Lutz, and Testa 2003; Testa 2012) while the largest one is foreseen (for high educated) in Italy.

Figure 1: Predicted probabilities and expected number of intended children by level of education and parity

Panel a) Predicted probabilities of zero-child intention

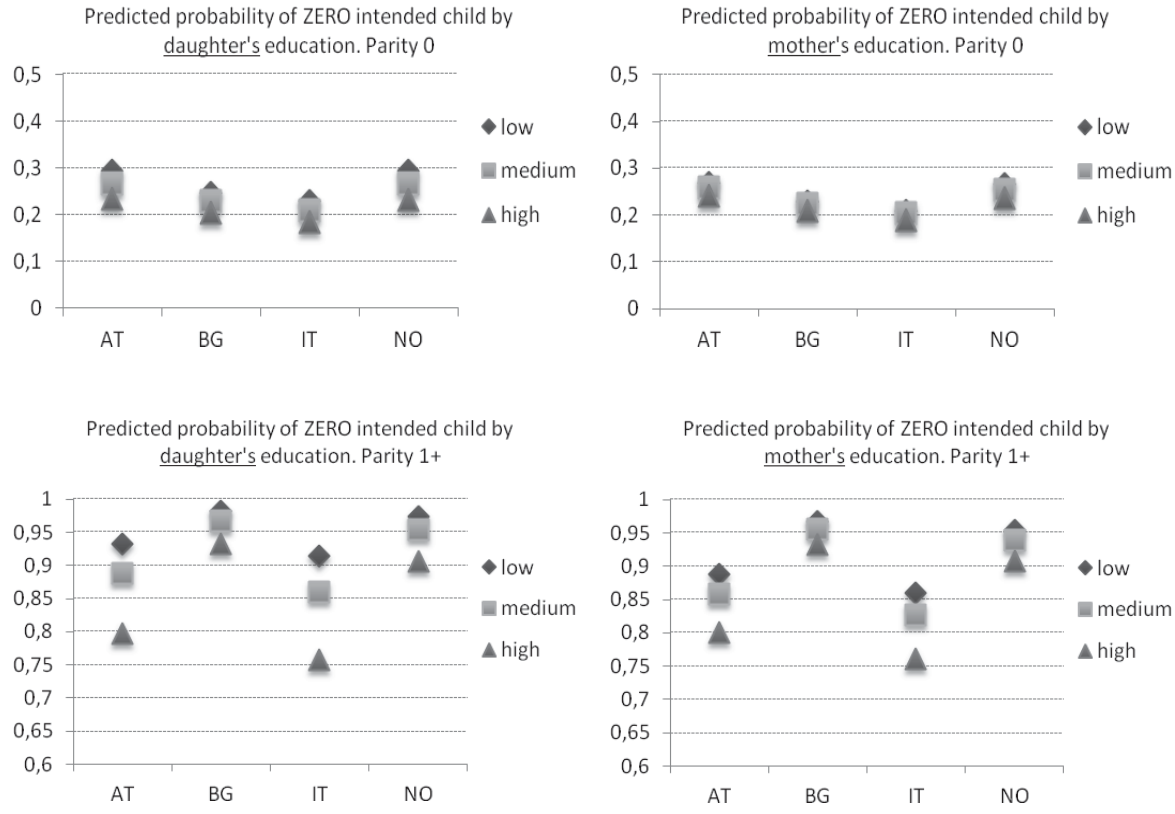
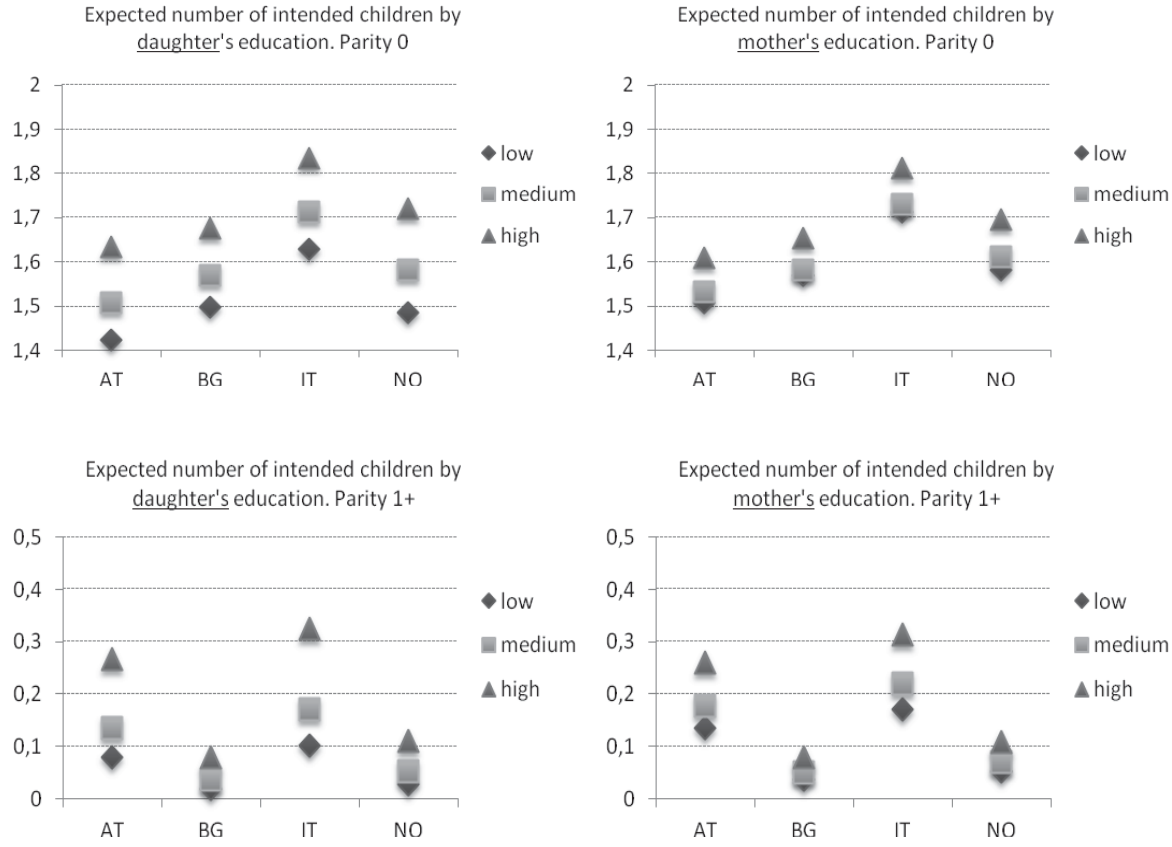


Figure 1 (continued):

Panel b) Expected number of intended children



Note: Predicted probabilities and expected number of intended children reported in the graphs are computed on the basis of Model IV estimated in Table 4.

4 Discussion

This study aimed at gaining a deeper understanding of the impact of mothers' socio-economic status on daughter's childbearing intentions by extending the extant literature on intergenerational transmission of fertility and fertility intentions. The results, based on the first round of the Generations and Gender Surveys conducted in Austria, Bulgaria, Italy, and Norway, confirmed that mother's number of children (i.e. daughter's number of siblings) is positively associated with daughter's number of intended children in all four countries (in support of hypothesis 1) and that this effect is stronger for childless daughters than for daughters who had initiated childbearing at the time of the survey. For this latter sub-group, the decision of whether to have another child is presumably more influenced by their own experience of parenthood than by their childhood/teenage experience they had in the family of origin. This empirical evidence lends support to previous literature explaining the mother–daughter link with socialisation theories and the availability of social support (as discussed in the Background section).

A second important finding of the analysis suggests that college-educated daughters are more likely to opt for a family with children and to plan a larger family size than their less educated counterparts, in support of our second research hypothesis. This result is in line with some recent research documenting a positive effect—whether artificial or not—of education on reproductive intentions in low fertility settings (Testa 2014). Yet this is in contrast to earlier studies which have found a negative effect of education on fertility behaviour, with better education being related to higher contraceptive use, greater opportunity costs of childbearing and fewer unplanned births (Bongaarts 2003; Gustavsson 2006; Jejeebhoy 1995) across different cultures and world regions since the early 20th century (see for a review Jones 1982; Skirbekk 2008). Self-selection, partner effect, or time squeeze (Kreyenfeld 2002) could be responsible for this positive association. Longitudinal studies in which women's fertility intentions are followed over a long time are the only possibility to investigate this research issue more deeply. Unfortunately, such data are not available for the countries considered.

A third important finding is related to the role of mother's socio-economic status in daughter's fertility intentions. Consistent with the third research hypothesis, we found that mother's level of education has a positive statistically significant effect on daughter's number of intended children and even after controlling for daughter's own education level, though only in the sub-sample of daughters with children. This finding suggests that having a highly educated mother positively influences the number of daughter's intended children, regardless of the mechanism behind such a link.

Contrary to research hypothesis 4, the mother's occupational/employment status when her daughter was a teenager did not significantly influence the daughter's fertility intentions. Neither was their relationship different in different countries (research hypothesis 5). In interpreting this finding we have to acknowledge that we lack information on whether the daughters perceived their mother's combination of family and career as a success (to be possibly imitated) or as a failure (to be avoided). Moreover, we used the mother's activity status as a proxy for intergenerational transmission of egalitarian gender role attitudes and therefore expected a positive association with a woman's childbearing intentions. However, homemaker mothers may be more likely to have more traditional attitudes than employed mothers (Bolzendahl and Myers 2004; Fan and Marini 2000; Zuo and Tang 2000) and therefore they may influence their daughters' fertility intentions towards having a larger family. This would average out the expected positive effect of having had a working mother, thus hindering a statistically significant association between working mother during daughter's teenage years and daughter's fertility intentions at reproductive age.

Finally, although country differences were observable in the predicted probabilities of intending to have no child at all and in the intended number of children, we could not detect any statistically significant country differences in the relationship between the mother's socio-economic status and the daughter's fertility intentions, contrary to our research hypothesis 5.

This paper offers a unique contribution by extending existing research on fertility intentions in several ways. First, focusing on mother's working status and educational

level when the daughter was 15 years old places emphasis upon a period in life where the socialization theory assumes children to be affected by their family environment. Moreover, the relation between mother's socio-economic status and daughter's fertility intention accounts for the intergenerational transmission of fertility behaviour, i.e., the number of siblings. Second, we also make a methodological contribution to this strand of literature: the zero-inflated Poisson regression model allowed us to separately treat the alternative 'children or no children' on the one hand, and the preference for a given family size on the other; this is clearly an advantage because these choices are qualitatively different. Third, the availability of a large-scale cross-national survey allowed us to make inferences about the role of mother's socio-economic status on the daughter's childbearing intentions by comparing Norway, Austria, Italy, and Bulgaria. The data revealed that the mother's socio-economic status positively influences the daughter's fertility intentions after the transition to a first child and that this association is common to all four countries considered. This result contrasts the negative education–fertility relation. To the extent that education is transmitted from mothers to daughters, the positive role of mother's socio-economic status on daughter's fertility decision-making offers a valuable interpretation for the positive link between education and fertility intentions that goes beyond the alternative of self-selection, partner effect or time squeeze.

References

Acock, Alan C., and Vern L. Bengtson. 1980. “Socialization and attribution process actual versus perceived similarity among parents and youth.” *Journal of Marriage and the Family* 42(3):501-515.

Ajzen, Icek. 1991. “The theory of planned behavior.” *Organizational Behavior and Human Decision Processes* 50:179-211.

Ajzen, Icek. 2005. “Laws of Human Behavior: symmetry, Compatibility, and Attitude-Behavior Correspondence.” Pp. 3-19 in Multivariate Research Strategies, edited by A. Beauducel, B. Biehl, M. Bosniak, W. Conrad, G. Schönberger, and D. Wagener. Maastricht, Netherlands: Shaker Publishers.

Ajzen, Icek, and Martin Fishbein. 1980. Understanding Attitudes and Predicting Social Behavior. Englewood Cliffs, NJ: Prentice Hall.

Barber, Jennifer S. 2001. “Ideational influences on the transition to parenthood: Attitudes toward childbearing and competing alternatives.” *Social Psychology Quarterly* 64:101-27.

Becker, G.S. 1981. A Treatise on the Family. Cambridge, MA: Harvard University Press.

Billari, Francesco C., Alice Goisis, Aart C. Liefbroer, Richard A. Settersen, Arnstein Aassve, Gunhild Hagestad, and Zsolt Speder. 2010. “Social age deadlines for the childbearing of women and men”. *Human Reproduction* 26:616-622.

Billari, Francesco C., Dimiter Philipov, and Maria Rita Testa. 2009. “Attitudes, norms and perceived behavioural control: Explaining fertility intentions in Bulgaria.” *European Journal of Population* 25:439-466.

Bolzendahl, Catherine I., and Daniel J. Myers. 2004. “Feminist attitudes and support for gender equality: opinion change in women and men, 1974–1998.” *Social Forces* 83:759–790.

Bongaarts, John. 1992. “Do reproductive intentions matter?” *International Family Planning Perspectives* 18:102-108.

Bongaarts, John. 2003. “Completing the fertility transition in the developing world: The role of educational differences and fertility preferences.” *Population Council, Policy Research Working Paper*, No. 177.

Bongaarts, John, and Susan C. Watkins. 1996. “Social interactions and contemporary fertility transitions.” *Population and Development Review* 22(4):639-682.

Chan, Christopher G., and Glen H. Elder Jr. 2000. “Matrilineal advantage in grandchild-grandparent relations.” *Gerontologist* 40(2):179-190.

Coall, David A., and Ralph Hertwig 2010. “Grandparental investments: past, present, and future.” Behavioural and Brain Sciences 33(1):1-59.

D’Addio, Anna Cristina, and Marco Mira d’Ercole. 2005. “Trends and determinants of fertility rates in OECD countries: The role of policies.” *OECD Social, employment and migration working papers*.

Del Boca, Daniela. 2002. “Low fertility and labour force participation of Italian women: evidence and interpretation.” OECD Labour Market and Social Policy Occasional Papers 61, OECD Publishing.

Del Boca, Daniela, and Alessandro Rosina. (2009). Famiglie Sole. Sopravvivere con un Welfare Insufficiente. Bologna: Il Mulino.

Del Boca, Daniela, and Daniela Vuri. 2007. “The mismatch between employment and child care in Italy: The impact of rationing.” *Journal of Population Economics* 20(4):805-832.

Dommermuth, Lars, Jane Klobas, and Trude Lappegård. 2011. “Now or later? The Theory of Planned Behaviour and timing of fertility intentions.” *Advances in Life Course Research* 16:42-53.

Dubas, Judith S. 2001. “How gender moderates the grandparent-grandchild relationship – A comparison of kin keeper and kin - selector theories.” *Journal of Family issues* 22(4):478- 492.

Easterlin, Richard A. (1980). Birth and Fortune. New York: Basic Books.

Elder, Jr., Glen H. 1977. “Family history and the life course.” Journal of Family History 2(4):279-304.

Elder, Jr., Glen H. 1994. “Time, human agency, and social change: Perspectives on the life course.” *Social Psychology Quarterly* 57(1):4-15.

Ellingsæter, Anne Lise, and Leira Arnlaug 2006. “Introduction: Politicising Parenthood in Scandinavia.” Pp. 1-25 in Gender Relations in Welfare States, edited by Anne Lise Ellingsæter and Arnlaug Leira. Bristol, UK: Policy Press.

Esping-Andersen, Gøsta. 1999. Social Foundations of Postindustrial Economies. Oxford: Oxford University Press.

Esping-Andersen, Gøsta. (2009). The Incomplete Revolution. Adapting to Women’s New Roles. Cambridge: Polity Press.

Fan, Pi-Ling, and Margaret M. Marini. 2000. “Influences on gender-role attitudes during the transition to adulthood.” *Social Science Research* 29:258–283

Fernandez, Raquel, and Alessandra Fogli. 2006. “Fertility: the role of culture and family experience.” *Journal of the European Economic Association* 4(2-3):552-561.

Fishbein, Martin, and Icek Ajzen. 2010. Predicting and Changing Behavior: The Reasoned Action Approach. New York: Psychology Press.

Folbre, Nancy. 1983. “Of patriarchy born: The political economy of fertility decisions.” *Feminist Studies* 9:261-284.

Gauthier, Anne H. 2007. “The impact of family policies on fertility in industrialized countries: a review of the literature.” *Population Research and Policy Review* 26:323-346.

Genov, Nikolai, and Anna Krasteva. 2001. Recent Social Trends in Bulgaria, 1960-1995. McGill- Queen's Press.

Glass, Jennifer, Vern L. Bengtson, and Charlotte C. Dunham. 1986. “Attitude similarity in three- generation families: Socialization, status inheritance, or reciprocal influence?” *American Sociological Review* 51(5):685-698.

Goldstein Joshua, Wolfgang Lutz, and Maria Rita Testa. 2003. “The emergence of sub-replacement fertility ideals in Europe.” *Population Research and Policy Review* 22(5-6):479-496.

Gustavsson, Siv. 2006. (ed.) Education and Postponement of Maternity. Amsterdam: Kluwer.

Hiekel, Nicole, and Teresa Castro-Martín. 2014. “Grasping the diversity of cohabitation: fertility intentions among cohabiters across Europe.” *Journal of Marriage and Family* 76:489-505.

Hin, Saskia, Anne H. Gauthier, Joshua Goldstein, and Christoph Bühler (2011). “Fertility preferences: what measuring second choices teaches us.” *Vienna Yearbook of Population Research* 9:131-156.

Hirsch, M.B., J.R. Seltzer, and M. Zelnik. 1981. “Desired Family Size of Young American Women, 1971 and 1976.” Pp. in Predicting Fertility, edited by Gerry E. Hendershot and Paul J. Placek. Lexington, MA: Lexington Books.

Iacovou, Maria, and Lara Patricio Tavares. 2011. “Yearning, learning, and conceding: Reasons men and women change their childbearing intentions.” *Population and Development Review* 37:89-123.

Jejeebhoy, Shireen J. 1995. Women’s Education, Autonomy and Reproductive Behaviour: Experience from Developing Countries. Oxford: Clarendon Press.

Jones, Elise F. 1982. Socio-economic Differentials in Achieved Fertility. World Fertility Survey Comparative Studies 21. Voorburg, Netherlands: International Statistical Institute.

Kahn, Joan R., and Kay E. Anderson. 1992. “Intergenerational pattern of teenage fertility.” Demography 29:39-57.

Kaser, Karl. 2008. Patriarchy After Patriarchy: Gender Relations in Turkey and in the Balkans, 1500-2000. Münster: Lit Verlag.

Keim, Sylvia, Andreas Klärner, and Laura Bernardi. 2009. „Who is relevant? Exploring fertility relevant social networks.” *MPIDR Working Paper* WP 2009-001.

Kohler, Hans-Peter, Jere R. Behrman, and Susan C. Watkins. 2001. “The density of social networks and fertility decisions: evidence from South Nyanza district, Kenya.” *Demography* 38(1):43-58.

Kohler, Hans-Peter, Joseph L. Rodgers, and Kaare Christensen. 1999. “Is fertility behavior in our genes? Findings from a Danish twin study.” *Population and Development Review* 25:253– 288.

Kotte, Markus, and Volker Ludwig. 2011. “Intergenerational transmission of fertility intentions and behaviour in Germany: the role of contagion.” *Vienna Yearbook of Population Research* 9:207–226.

Kravdal, Øystein, and Ronald R. Rindfuss. 2008. "Changing relationships between education and fertility: A study of women and men born 1940 to 1964." *American Sociological Review* 73:854–873.

Kreyenfeld, Michaela. 2002. "Time squeeze, partner effect or self-selection? An investigation into the positive effect of women's education on second birth risks in West Germany." *Demographic Research* 7(2):15-48.

Kye, Bongoh. 2011. "Intergenerational transmission of women's educational attainment in South Korea: An application of a multi-group population projection model." *Demographic Research* 24(3):79-112.

Lambert, Diane. 1992. "Zero-Inflated Poisson regression, with an application to defects in manufacturing." *Technometrics* 34(1):1-14.

Lappegård, Trude. 2010. Family policies and fertility in Norway. *European Journal of Population* 26:99-116.

Lee, Ronald. 1980. "Aiming at moving target: period fertility and changing reproductive goals." Population Studies 34:205-226.

Liefbroer, Aart C. 2009. "Changes in family size intentions across young adulthood: A life- course perspective." *European Journal of Population* 25:363-386.

Liefbroer, Aart C., and Francesco C. Billari. 2010. "Bringing norms back in: a theoretical and empirical discussion of their importance for understanding demographic behaviour." *Population, Space and Place* 16(4):287-305.

Liefbroer, Aart C., and Cees H. Elzinga. 2012. "Intergenerational transmission of behavioural patterns: How similar are parents' and children's demographic trajectories?" *Advances in Life Course Research* 17(1):1-10.

Lupri, Eugen. 1983. The Changing position of Women in Family and society: A Cross-National Comparison. Leiden: E. J. Brill.

Mace, Ruth, and Rebecca Sear. 2005. Are humans cooperative breeders? Pp. 143-159 in Grandmotherhood: The Evolutionary Significance of the Second Half of Female Life, edited by E. Voland, A. Chasiotis, and W. Schiefenhövel. New Brunswick, NJ: Rutgers University Press.

Mare, Robert D., and Vida Maralani. 2006. "The intergenerational effects of changes in women's educational attainments." *American Sociological Review* 71(4):542- 564.

Matras, Judah. 1961. "Differential fertility, intergenerational occupational mobility, and change in the occupational distribution: Some elementary interrelationships." *Population Studies* 15(2):187-197.

McDonald, Peter. 2000. "Gender equity in theories of fertility transition." *Population and Development Review* 26(3):427–439.

McDonald, Peter. 2006. "Low fertility and the state: The efficacy of policy." *Population and Development Review* 32(3):485–510.

Mencarini, Letizia, and Maria Letizia Tanturri. 2004. "Time use, family role-set and childbearing among Italian working women." *Genus* 60(1):111–137.

Miller, Warren B. 2011. “Differences between fertility desires and intentions: implication for theory, research and policy.” *Vienna Yearbook of Population Research* 9:75-98.

Miller, Warren B., and David J. Pasta. 1995. “Behavioural intentions: which ones predict fertility behaviour in married couples?” *Journal of Applied Social Psychology* 25:530-555.

Mills, Melinda, Letizia Mencarini, Maria Letizia Tanturri, and Katia Begall. 2008. “Gender equity and fertility intentions in Italy and the Netherlands.” *Demographic Research* 18(1):1–26.

Montgomery, Mark R., and John B. Casterline. 1996. “Social learning, social influence, and new models of fertility.” *Population and Development Review* 22:151-175.

Morgan, Kimberly J. 2006. Working Mothers and the Welfare State: Religion and the Politics of Work-Family Policies in Western Europe and the United States. Stanford, CA: Stanford University Press.

Moursund, Anne, and Øystein Kravdal. 2003. “Individual and community effects of women’s education and autonomy on contraceptive use in India.” *Population Studies* 57(3):285-301.

Murphy, Michael, and Lisbeth B. Knudsen. 2002. “The intergenerational transmission of fertility in contemporary Denmark: the effects of number of siblings (full and half), birth order, and whether male or female.” *Population Studies* 56(3):235-248.

Murphy, Michael, and Duolao Wang. 2001. “Family-level continuities in childbearing in low- fertility societies.” *European Journal of Population* 17(1):75-96.

Naldini, Manuela. 2003. The Family in the Mediterranean Welfare States. London/Portland: Taylor and Francis.

Osiewalska, Beata. 2013. “Transmission of fertility pattern in mother–daughter relation – Bayesian view (a case study of Austria).” *Studia Demograficzne* 1(163):3-35.

Pissarides, Christopher A., Pietro Garibaldi, Claudia Olivetti, Barbara Petrongolo, & Etienne Wasmer. 2003. “Women in the labor force: How well is Europe doing?” Report prepared for the fifth Annual European Conference of the Fondazione Rodolfo Debenedetti, Milan. Available at: http://people.bu.edu/olivetti/papers/women.pdf.

Pollet, Thomas V., Mark Nelissen, & Daniela Nettle. 2009. “Lineage based differences in grandparental investment: Evidence from a large British cohort study.” *Journal of Biosocial Science* 41(3):355-379.

Rodgers, Joseph L., & Debby, Doughty. 2000. Genetic and Environmental Influences on Fertility Expectations and Outcomes Using NLSY Kinship Data. Pp. 85-105 in Genetic Influences on Human Fertility and Sexuality, edited by Rodgers, Joseph L., David C. Rowe, and Warren B. Miller. New York: Springer US.

Saraceno, Chiara. 1997. Family change, family policies and the restructuring of welfare. Pp. 81- 100 (Vol. 21) in Family, market and community. Equity and efficiency, edited by OECD. Paris: OECD, Social policy studies.

Scherbov, Sergei, Marija Mamolo, Michaela Potančoková, Tomáš Sobotka, and Kryštof Zeman. *European Demographic Data Sheet 2014*. Wittgenstein Centre for Demography and Global Human Capital (IIASA, VID/ÖAW, WU)

Skirbekk, Vegard. 2008. "Fertility trends by social status." *Demographic Research* 18(5):145-180.

Starrels, Marjorie E., and Kristen E. Holm. 2000. "Adolescents' plans for family formation: Is parental socialization important?" *Journal of Marriage and the Family* 62(2):416-429.

Tanskanen, Antti O., and Anna Rotkirch. 2014. "The impact of grandparental investment on mother's fertility intentions in four European countries." *Demographic Research* 31(1):1-26.

Testa, Maria Rita, and Leonardo Grilli. 2006. "The influence of childbearing regional contexts on ideal family size in Europe." *Population-E* 61(1–2):109–138.

Testa, Maria Rita, and Laurent Toulemon. 2006. Family formation in France: individual preferences and subsequent outcome. *Vienna Yearbook of Population Research* 4:41-75.

Testa, Maria Rita. 2012. Family Sizes in Europe: Evidence from the 2011 Eurobarometer Survey. European Demographic Research Paper 2. Vienna: Vienna Institute of Demography, Austrian Academy of Sciences.

Testa, Maria Rita. 2014. "On the positive correlation between education and fertility intentions in Europe: Individual- and country-level evidence." *Advances in Life Course Research* 21:28-42. Open access.

Thévenon, Olivier, and Krystyna Horko. 2009. "Increased women's labour force participation in Europe: Progress in the work-life balance or polarization of behaviours?" Population 64(2):235-272.

Thomson, Elisabeth. 1992. "Family structure, gender and parental socialization." *Journal of Marriage and the Family* 54(2):368-378.

Thomson, Elisabeth. 1997. "Couple childbearing desires, intentions, and births." Demography 34(3):343-354.

Van Bavel, Jan. 2006. "The effect of fertility limitation on intergenerational social mobility: The quality-quantity trade off during the demographic transition." J Biosoc Sci 38(4):553-569.

Westoff, Charles F., and Raymond H. Potvin 1967. College Women and Fertility Values. Princeton: Princeton University Press.

Zuo, Jiping, and Shengming Tang. 2000. Breadwinner status and gender ideologies of men and women regarding family roles. *Sociological Perspectives* 43(1):29–43.

APPENDIX

Table 4: Intended children among daughters aged 18-45. Zero-inflated regression models. N= 4,215 parity zero; 8,391 parity one or above

Panel a) Zero part of the model – odds ratio of intending no child

	MODELS FOR PARITY ZERO				PARITY ONE AND ABOVE			
	I	II	III	IV	I	II	III	IV
Constant	0.10 ***	0.11 ***	0.11 ***	0.10 ***	1.77 **	2.04 ***	1.71 **	1.87 **
N. siblings (Ref. 1)								
No sibling	1	1	1	1	1.19	1.21	1.19	1.21
Two siblings	1.03	1.02	1.02	1.02	1.16	1.13	1.15	1.11
Three or more siblings	1.16	1.14	1.14	1.13	0.91	0.87	0.89	0.85
Education (Ref. medium)								
Low	1.23	1.21	1.21	1.45 +	1.67 ***	1.56 *	1.66 **	1.51 *
High	0.74 +	0.77	0.77	0.75 +	0.53 ***	0.60 ***	0.53 ***	0.59 ***
Mother's education (Ref. low)								
Medium education		0.88		0.90		0.81		0.98
High education		0.80		0.82		0.55 **		0.54 **
Mother's occupation at teenage (Ref. working)								
Mother not working			0.88	0.99			1.11	1.07
Interactions								
Daughter's low edu * NO				0.47 *				
Mother's medium edu * BG								0.57 *
Country (Ref. Austria)								
Bulgaria	0.39 ***	0.39 ***	0.39 ***	0.38 ***	2.64 ***	2.71 ***	2.71 ***	3.62 ***
Italy	0.57 ***	0.54 **	0.54 **	0.53 ***	0.82	0.76	0.80	0.80
Norway	1.25	1.27	1.27	1.44 +	1.85 ***	1.96 ***	1.88 ***	1.97 ***

	MODELS FOR PARITY ZERO				PARITY ONE AND ABOVE			
	I	*II*	*III*	*IV*	*I*	*II*	*III*	*IV*
Age group (Ref.30—34)								
18-24	0.56 *	0.57 *	0.57 *	0.59 *	0.22 ***	0.22 ***	0.22 ***	0.22 ***
25-29	0.64 *	0.64 *	0.64 *	0.65 *	0.35 ***	0.36 ***	0.35 ***	0.36 ***
35-39	3.54 ***	3.49 ***	3.49 ***	3.53 ***	3.52 ***	3.47 ***	3.50 ***	3.45 ***
40-44	17.7 ***	17.37 ***	17.37 ***	17.88 ***	11.57 ***	11.21 ***	11.48 ***	11.14 ***
45-49	50.48 ***	49.34 ***	49.34 ***	51.13 ***	39.25 *	38.13 *	38.82 *	37.78 *
Marital status (Ref. married)								
Single	2.89 ***	2.9 ***	2.9 ***	2.88 ***	0.84	0.83	0.83	0.81
Partnered, not married	1.38	1.38	1.38	1.37	0.54 ***	0.54 ***	0.55 ***	0.53 ***
Divorced	1.33	1.33	1.33	1.36	1.02	1.04	1.02	1.04
Employment status (ref. employed)								
Unemployed	1.45 +	1.44	1.44	1.42	1. 39	1.35	1.39	1.30
Not active	4.01 ***	4.00 ***	4.00 ***	3.79 ***	0.93	0.93	0.92	0.93
Enrolled in education	1.13	1.17	1.17	1.14	0.57	0.59	0.57	0.60
Living arrangements (Ref. left 6+ years)								
Left <6 years	0.61 *	0.61 *	0.61 *	0.62 *	0.39 ***	0.40 ***	0.39 ***	0.39 ***
Living with parents	0.84	0.84	0.84	0.86	0.61 *	0.62 *	0.61 *	0.63 +

Note: + p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001.

Table 4: (continued)

Panel b) Count part of the model – risk ratio of intending a given number of children

	MODELS FOR PARITY ZERO								PARITY ONE AND ABOVE							
	I		*II*		*III*		*IV*		*I*		*II*		*III*		*IV*	
Constant	1.68	***	1.67	***	1.68	***	1.69	***	0.44	***	0.41	***	0.45	***	0.42	***
N. siblings (Ref. 1)																
No sibling	0.98		0.98		0.98		0.98		0.92		0.91		0.92		0.91	
One sibling (ref.)	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Two siblings	1.08	*	1.08	*	1.08	*	1.08	*	0.95		0.96		0.95		0.97	
Three or more siblings	1.15	***	1.16	***	1.16	***	1.16	***	1.16	+	1.18	*	1.16		1.19	*
Education (Ref. medium)																
Low	0.96		0.96		0.96		0.92	+	0.76	**	0.79	*	0.76	**	0.81	*
High	1.07		1.06	.	1.07	+	1.07	+	1.53	***	1.43	***	1.53	***	1.43	***
Mother's education (Ref. low)																
Medium education			1.00				1.00				1.13				1.02	
High education			1.05				1.04				1.35	**			1.39	**
Mother's occupation at teenage (Ref. working)																
Mother not working					0.99		0.99						0.98		1.01	
Interactions																
Daughter's low edu * NO							1.19	*								
Mother's medium edu * BG															1.39	*
Country (Ref. Austria)																
Bulgaria	0.98		0.98		0.98		0.98		0.59	***	0.59	***	0.59	***	0.50	***
Italy	1.08	*	1.08	*	1.08	*	1.09	*	1.01		1.05		1.02		1.02	
Norway	1.09	*	1.08	+	1.08	+	1.04		0.65	***	0.64	***	0.65	***	0.63	***

	MODELS FOR PARITY ZERO								PARITY ONE AND ABOVE							
	I		*II*		*III*		*IV*		*I*		*II*		*III*		*IV*	
Age (Ref. 30-34)																
18-24	1.18	***	1.18	**	1.18	***	1.18	***	2. 35	***	2.34	***	2.35	***	2.33	***
25-29	1.10	*	1.10	*	1.10	*	1.10	*	1.92	***	1.90	***	1.92	***	1.89	***
35-39	0.71	***	0.71	***	0.71	***	0.71	***	0.38	***	0.39	***	0.38	***	0.39	***
40-44	0.27	***	0.27	***	0.27	***	0.27	***	0.13	***	0.14	***	0.14	***	0.14	***
45-49	0.13	***	0.13	***	0.13	***	0.13	***	0.04	*	0.04	*	0.04	***	0.04	*
Marital status (Ref. married)																
Single	0.85	**	0.85	**	0.85	**	0.85	**	1.24		1.23		1.24		1.25	
Partnered, not married	0.92	+	0.92	+	0.92	+	0.92	+	1.39	***	1.39	***	1.39	***	1.41	***
Divorced	0.94		0.94		0.94		0.94		0.96		0.94		0.96		0.94	
Employment status (ref. employed)																
Unemployed	0.96		0.96		0.96		0.97		0.84		0.86		0.84		0.88	
Not active	0.76	*	0.76	*	0.76	*	0.77	*	1.03		1.03		1.03		1.03	
Enrolled in education	1.02		1.02		1.02		1.02		1.35		1.28		1.35		1.26	
Living arrangements (Ref. left 6+ years)																
Left <6 years	1.08	+	1.08	+	1.08	+	1.07		1.53	***	1.51	***	1.53	***	1.52	***
Living with parents	1.06		1.06		1.06		1.05		1.33	*	1.33	*	1.33	*	1.30	*

Note: + p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001.

VIENNA INSTITUTE OF DEMOGRAPHY

Working Papers

Hoffmann, Roman and Raya Muttarak, *A Tale of Disaster Experience in Two Countries: Does Education Promote Disaster Preparedness in the Philippines and Thailand*, VID Working Paper 9/2015.

Klotz, Johannes and Richard Gisser, *Mortality Differentials by Religious Denomination in Vienna 1981-2002*, VID Working Paper 8/2015.

Steiber, Nadia and Barbara Haas, *Overworked or Underemployed? Actual and Preferred Household Employment Patterns in the Context of the Economic Crisis*, VID Working Paper 7/2015.

Beaujouan, Eva, Zuzanna Brzozowska and Krystof Zeman, *Childlessness Trends in Twentieth-Century Europe: Limited Link to Growing Educational Attainment*, VID Working Paper 6/2015.

Abel, Guy, *Estimates of Global Bilateral Migration Flows by Gender between 1960 and 2010*, VID Working Paper 5/2015.

Spijker, Jeroen, *Alternative Indicators of Population Ageing: An Inventory*, VID Working Paper 4/2015.

Kuhn, Michael and Klaus Prettner, *Population Structure and Consumption Growth: Evidence from National Transfer Accounts*, VID Working Paper 3/2015.

Sobotka, Tomáš, *Low Fertility in Austria and the Czech Republic: Gradual Policy Adjustments*, VID Working Paper 2/2015.

Buber-Ennser, Isabella, *Aspects of Gender Mainstreaming of Family and Work in Austria*, VID Working Paper 1/2015.

Buber-Ennser, Isabella and Ralina Panova, *Attitudes towards Parental Employment across Europe, in Australia and in Japan*, VID Working Paper 5/2014.

Kumar, Abhishek, Valeria Bordone and Raya Muttarak, *Influence of Older Generation's Fertility Behaviours on Daughter's Desired Family Size in Bihar, India*, VID Working Paper 4/2014.

Sobotka, Tomáš and Éva Beaujouan, *Two is Best? The Persistence of a Two-child Family Ideal in Europe*, VID Working Paper 3/2014.