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*Research Article*

**Are daughters' childbearing intentions related to their mothers' socio-economic status?**

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## **Are daughters' childbearing intentions related to their mothers' socio-economic status?**

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### **Abstract**

#### **BACKGROUND**

Unlike actual fertility, fertility intentions are often found to be positively correlated with education. The literature explaining this paradox is scarce.

#### **OBJECTIVE**

We aim to fill the gap in the existing scientific literature by searching for the main factors that influence highly educated women to plan a larger family size.

#### **METHODS**

Using the first wave of the Generations and Gender Survey 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 sibship size. Zero-inflated Poisson regression models are employed to estimate the predictors of women's additionally intended number of children.

#### **RESULTS**

We find that the effect of family of origin is exerted mainly through sibship 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

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mother's level of education: Daughters with highly educated mothers intend to have more children.

## **CONCLUSIONS**

The empirical results suggest that the positive link between births 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 positive reproductive plans.

## **CONTRIBUTION**

The positive role of mother's socio-economic status on daughter's fertility decision-making offers a valuable interpretation of the positive link between education and fertility intentions which goes beyond the alternative explanations referring to self-selection, partner effect, or time squeeze, and needs to be confirmed by further research.

## **1. 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 highly educated mothers who worked during their daughters' teenage years are more able to reconcile a family life with children and 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 variation. The novelty of this analysis lies in a 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. Continuity between parents and children in fertility-related outcomes has consequences in terms of both population size and structure. Hence, more knowledge about the intergenerational transmission of fertility is particularly valuable.

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

## **2. Background**

This study lies at the intersection of 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 the parent-child relationship during childhood and adolescence significantly influence both the intentions and the behaviours of children in adulthood, as in the ‘linked lives’ theoretical framework (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 the immediate antecedent of the corresponding behaviour (Ajzen 1991; 2005; Ajzen and Fishbein 1980; Fishbein and Ajzen 2010). The intentions to perform a behaviour (in this study, fertility) are determined by personal factors (i.e., attitudes related to the perceived benefits and costs of reproduction), social influences (i.e., subjective norms based on social approval from relevant others), and an individual’s perception of her/his 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 forming the fertility intentions of adult daughters.

A wide array of studies has shown that mothers serve as significant others from whom daughters learn. 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 mothers' socio-economic characteristics as predictors of daughters' 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 orientation to their children both directly and indirectly, early in life as well as across the life course. 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 by 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 children born into small birth cohorts having better economic conditions. Genetic studies have stressed the importance of inherited and environmental factors in explaining mother-daughter similarities in fertility intentions and behaviour (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 the early family socialisation environment in intergenerational transmission of fertility intentions. Deriving from previous literature

on intergenerational transmission of fertility, it is expected that *a mother's number of children is positively associated with her daughter's intended family size* (H1).

It is also worth noting 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).

## 2.1 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. However, the effect of a woman's education on her own fertility intentions is 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 for 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 that *daughter's level of education is positively associated with 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 in previous results showing an effect of significant others' education on contraceptive use among women in developing countries (e.g., Moursund and Kravdal 2003). 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. A mother's high socio-economic status normally implies that she enjoys healthier and wealthier conditions, which in turn translate into stronger potential support for her daughter(s) in terms of monetary transfers, emotional support, and provision of help: circumstances that may favour daughters' reproductive plans (Tanskanen and Rotkirch 2014). Thus, we expect that *mother's level of education is positively associated with daughter's number of intended children* (H3).

Previous research (Testa 2014) has suggested that there might 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 hand. Following this argument, it is likely that the fertility intentions of daughters are affected by whether their mothers were working when they were teenagers. Women whose mothers were working during their teenage years learned from their mother's experience and formed reproductive intentions in a different way than peers whose mothers remained 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 in both directions of association, depending on whether or not the mother successfully balanced family and career and was able to transmit this positive model to her daughter. Without 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 factor promoting 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 positive attitudes towards working to their daughters (e.g., Bolzendahl and Myers 2004; Fan and Marini 2000). Hence, it can be expected that *women whose mothers worked during their daughters' teenage years have a higher intended number of children than their counterparts whose mothers remained at home* (H4). A crucial mechanism behind this association is the inheritance of the double-burden model, encompassing both family and childcare duties. Other possible indirect mechanisms may relate to the predisposition to select a partner more prone to help in household and childcare tasks.



## 2.2 A cross-country comparison

Four European countries are considered: Norway from Scandinavia, Austria from Central Europe, Italy from the Mediterranean, and Bulgaria from Eastern Europe. These countries differ in terms of economic opportunity, employment level, welfare system, and family policy, which could all have implications for cross-national differences in fertility levels, and thus are good subjects for comparative study. We were unable to enlarge this comparative setting to other countries whose data are 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 2010. Two aspects are worth noticing: first, the large increase in the proportion of employed women in each country over the whole period, and second, the persistent cross-country difference in the level of female employment, which is still remarkable in the year 2010. Since 1980 the Italian female employment rate has been almost half that in Norway. 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 occupy 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 <sup>d</sup>	1980 <sup>d</sup>	2000 <sup>d</sup>	2010 <sup>e</sup>
Austria	55.2 <sup>a,1</sup>	52.4	59.3	65.7
Bulgaria	33.5 <sup>b,9</sup>	66.5 <sup>c</sup>	46.3 <sup>b</sup>	56.4
Italy	28.1	33.2	39.7	46.1
Norway	26.1	58.4	73.4	73.3

Note: a) labour force of all ages divided by the population 15-64 years old; b) all ages; c) data from 1990.

Source: d) Pisarides et al. 2005; e) data downloaded from Eurostat (<http://appsso.eurostat.ec.europa.eu/hui/submitViewTableAction.do>) on 25 July 2016; f) Lupri 1983; g) Kaser 2008.

A similar pattern of difference can 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). The Austrian fertility level is close to that of Italy (1.44) (Scherbov et al. 2014).

The size of the service sector partly explains the between-country differences in female labour force participation (Saraceno 1997) as it is a disproportionately large sector in the female labour market. Indeed, Italy – the country with the lowest female employment rate in our comparative framework – is 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 provision 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 the central role of woman as principal caregivers (Esping-Andersen 1999), is characterised by a rigidity in the labour market that simultaneously increases the costs of having children and discourages the 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 system, based on individual independence and collective social solidarity, pioneered the transformation of parenthood into a political issue, 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 parental leave policies, large supply of part-time jobs with extensive social benefits, subsidised day care facilities, flexible working hours, and economic support for families with children contribute to both female employment and childbearing. Norway, however, has a more 'dualistic' family policy than other countries and ranks high on policies that give both dual-earner support and 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 of Austria leaned toward the male-breadwinner model and did not produce policies encouraging mothers' employment. More recent flexible working-time arrangements have allowed women to combine work and family life, with part-time work being the main option. In 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, as in Italy, women have a central role in the family, but as opposed to 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 other European countries, with a peak in the mid-1980s, but has 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 in daughters' fertility intentions in those countries with limited institutional support for 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 through the example of (their or others') mothers.

### **3. Data and method**

#### **3.1 Sample**

We used data from the GGS, carried out from 2002 as part of the Generation and Gender Programme (GGP, [www.ggp-i.org](http://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, for Bulgaria in 2004, for Austria in 2008/2009, and for Norway in 2007/2008. Although fecundity may be quite low at older reproductive ages (45–49), we decided not to omit this group from the empirical analysis. Indeed, several circumstances could increase the likelihood that women aim to realize their childbearing intentions towards the end of their reproductive life, such as, for example, better health at these ages and the increased availability of assisted reproductive technologies. These circumstances might affect especially highly educated women who might plan to have a(nother) child relatively late in life. After this selection the working sample consisted of 12,606 women aged 18 to 49 for whom information about their mothers was available. We selected only the daughter–mother sample because our focus is on transmission models across female generations. The non-response rate for the question on mother's occupational status was low (3%). The large majority of interviewed daughters (93%) answered questions regarding fertility intentions. Interestingly, previous literature has shown that most relevant link in the intergenerational transmission of fertility is that between mother and daughter (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 life, whereas the intention of a higher parity transition (to second or higher birth order child) is 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 daughters without any children, and 8,391 daughters with at least one child. We were unable to add an additional stratification that distinguished between daughters with just one child and daughters with two or more children because in the parity 2+ group most daughters had already completed their family size and reported a negative answer to the question regarding fertility intentions

(92.8%). Indeed, in the parity 1+ sub-sample the variance in the fertility intentions variable was already low – positive fertility intentions were just 18%.

### 3.2 Measures of fertility intention 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". 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 after that), 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 positive (the answer to one of the two questions on childbearing intentions was either "probably" or "definitively"), the following question was asked: "How many (more) children in total do you intend to have?" Respondents were required to indicate a numerical answer ranging from 0 to 8. The variable 'additionally intended number of children' is the outcome of the count component of the ZIP model (see next section on modelling).

The key explanatory variables are the following:

- a. *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.
- b. *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); and high (ISCED 5–6 = tertiary) educational attainment.
- c. *Mother's educational attainment*, coded in three categories as for the daughter.
- d. *Mother's occupational status* when daughter was 15 years old. The survey question was, "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](http://www.ilo.org)).

We created a binary variable coded 1 if the mother was working and 0 otherwise.

- e. *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 when significant.
- f. Control variables include: age, marital status, employment status, and living arrangement. They all refer to daughter's characteristics at the time of interview. Age was grouped in six categories: 18–24, 25–29, 30–34 (reference), 35–39, 40–44, and 45–49. Marital status was coded in four categories: married (reference category), single, partnered but not married, and divorced or widowed. Employment status was included as a four-category 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 the respondent had left the parental home. Three dummies were computed and included in 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 six years or more."

The full distribution of the variables used in the regression analysis by parity and country 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 to 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 single children (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.

**Table 2: Descriptive statistics of variables used in the regression. Values in %. 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
<i>Fertility intention</i>										
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
<b>Mother's characteristics</b>										
<i>Education</i>										
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
<i>Occupational status</i>										
Working	65	93	45	80	70	55	92	36	74	68
Not working	35	7	55	20	30	45	8	64	26	32
<b>Daughter's characteristics</b>										
<i>Number of siblings</i>										
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
<i>Education</i>										
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
<i>Employment status</i>										
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
<i>Age</i>										
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

**Table 2: (Continued)**

	PARITY ZERO					PARITY ONE AND ABOVE				
	AT	BG	IT	NO	All	AT	BG	IT	NO	All
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	4,215	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.

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 those childless are still enrolled in education (27%): These percentages range from one-quarter to one-third, depending on the country considered.

Sixty-five per cent 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 great 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 six 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 in the higher parity sample the majority are low-educated (56%); 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 worked 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.

### 3.3 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 with the standard Poisson distribution, are 'expected' and are also called Poisson or imperfect zeros, while the others are 'unexpected' and are 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 infertility); 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 of starting or enlarging their family, but still answer 'zero'; for example, because they are negatively oriented toward additional childbearing).

Hence, ZIP is a statistical model (one distribution) that 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  $\lambda$ . These two regressions are connected by the probability  $(1-p)$ . The formula for the ZIP model, assuming  $n$  independent variables  $Y_i$  ( $i = 1, 2, \dots, n$ ) can be represented as follows:

$$P(Y_i = y_i) = \left\{ \begin{array}{l} p_i + (1 - p_i) \exp(-\lambda_i), y_i = 0 \\ (1 - p_i) \exp(-\lambda_i) \frac{\lambda_i^{y_i}}{y_i!}, y_i = 1, 2, \dots \end{array} \right\} p_i \in [0,1]$$

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

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



where  $x_i$  and  $\omega_i$  are vectors of covariates and  $\gamma$  and  $\delta$  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 infertility. This aspect is taken into account in the model that 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) differ from negative fertility intentions (i.e., the intention not to have a(nother) child)<sup>5</sup> 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 is a convincing argument for using this complex and less parsimonious model 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 teen age, 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.

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<sup>5</sup> 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).

## 4. Results

### 4.1 Descriptive analysis

Table 3 reports, separately by parity (zero; one or above), the percentage of daughters intending a(nother) child (upper part), and daughters' mean intended family size (bottom part), by daughter's and mother's level of education and by country. The great majority of childless daughters intend to have at least a first child (81% of parity-zero daughters in the pooled sample report the intention of having a child) but only 18% of those who already have one or more children at the time of the survey express the intention to have a(nother) child. The mean intended family size in the pooled dataset is 1.67 among childless daughters and 2.19 among daughters with children (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 in the future (i.e., complete family size). By contrast, in the outcome variable of the regression models (Models I-IV, Table 4) 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.

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 for 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 a 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.

**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+
<i>Daughter's education</i>										
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
<i>Mother's education</i>										
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
<b>Number of intended children (Mean)</b>										
Parity	0	1+	0	1+	0	1+	0	1+	0	1+
<i>Daughter's education</i>										
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
<i>Mother's education</i>										
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	4,215	8,391

Source: Authors' elaboration based on Generation and Gender Surveys: 2003 Italy, 2004 Bulgaria, 2008/2009 Austria, and 2007/2008 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 already have 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 daughters with a medium-educated mother report the lowest number of intended children. Unlike other countries, in Italy the mean intended family size increases with mother's educational level in both parity sub-groups, zero and higher.

## 4.2 Regression analysis

Table 4 reports the estimates of ZIP models run separately on childless daughters and daughters with children. Data for all 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 ratios; 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 ratios. 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) of Table 4 respectively. We comment on 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, only 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 either the no-child intention or 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 effect 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 is 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 positive effect on the zero-child intention and a statistically significant negative effect on the total number of intended children. 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 ratios 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 the 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). For only 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-Martin 2014).

Being inactive 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 who 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 for daughters at parity one and above. Moreover, in this latter sub-sample, still living with parents is also statistically significantly associated with a lower preference for not having another child. Finally, daughters with children who still live with their parents or left the parental home less than six years ago are more likely to intend to have a larger family as compared to their counterparts who left the parental home six or more years ago (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 the one hand and high education on the other.

In all four countries, highly educated daughters were found to expect a higher number of intended children. In the sub-sample of daughters with one or more children, 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 was found in Austria and Norway, the lowest probability 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 was observed in Austria and Italy. The smallest intended number is predicted for (the low-educated in) Austria, consistent with previous findings (Goldstein, Lutz, and Testa 2003; Testa 2012), while the largest intended number is foreseen (for the high-educated) in Italy.

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

Panel a) Zero part of the model – odds ratios 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 **
<i>N. siblings (Ref. One)</i>								
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
<i>Education (Ref. medium)</i>								
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 ***
<i>Mother's education (Ref. low)</i>								
Medium		0.88		0.90		0.81		0.98
High		0.80		0.82		0.55 **		0.54 **
<i>Mother's occupation at teenage (Ref. working)</i>								
Mother not working			0.88	0.99			1.11	1.07
<i>Interactions</i>								
Daughter's low edu * NO				0.47 *				
Mother's medium edu * BG								0.57 *
<i>Country (Ref. Austria)</i>								
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 ***

**Table 4: (Continued)**

	MODELS FOR PARITY ZERO				PARITY ONE AND ABOVE			
	I	II	III	IV	I	II	III	IV
<i>Age group (Ref.30–34)</i>								
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 *
<i>Marital status (Ref. married)</i>								
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
<i>Employment status (ref. employed)</i>								
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
<i>Living arrangements (Ref. left 6+ years)</i>								
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 ratios 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. One)								
No sibling	0.98	0.98	0.98	0.98	0.92	0.91	0.92	0.91
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		1.00		1.00		1.13		1.02
High		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 ***

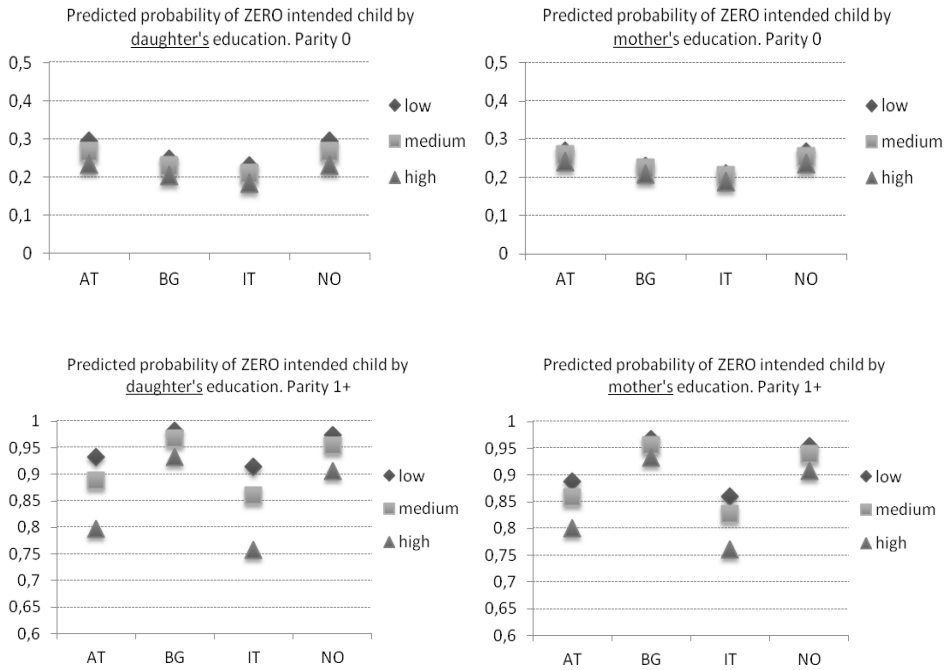
**Table 4: (Continued)**

	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.

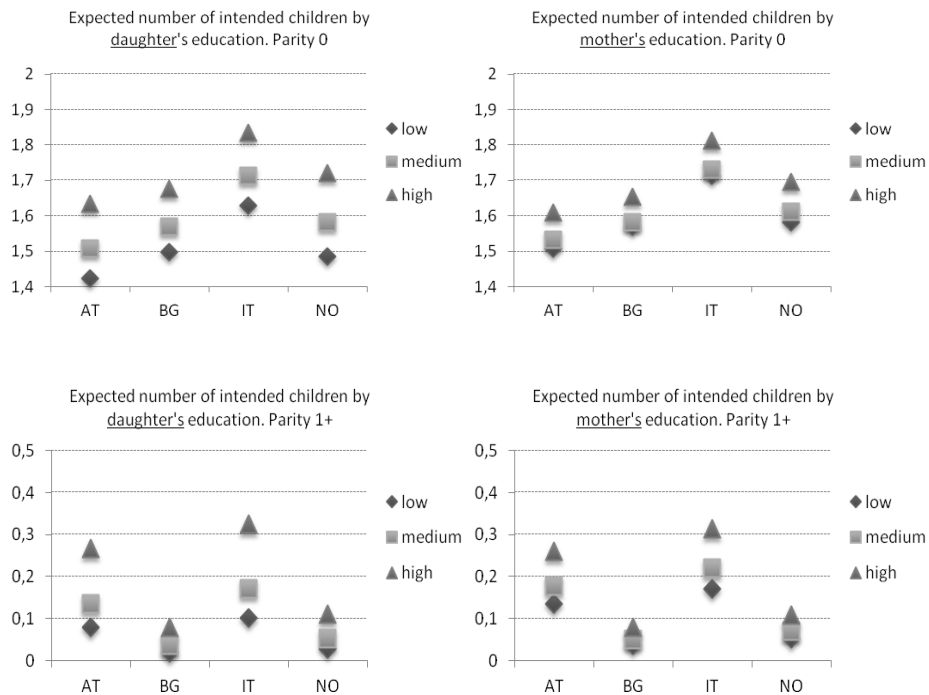
**Figure 1: Predicted probability and expected number of intended children by level of education and parity**

*Panel a) Predicted probability 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 Models IV estimated in Table 4.

## 5. Discussion

This study investigated the impact of mothers' socioeconomic status on daughters' 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, confirm 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 in the family of origin. This empirical evidence lends support to previous literature that explains 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 reveals 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 that 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 from the early 20th century (see for a review Jones 1982; Skirbekk 2008).

A third important finding is related to the role of the mother’s socio-economic status in the 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, 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 the daughter’s intended children, regardless of the mechanism behind such a link.

Contrary to research hypothesis 4, mother’s occupational/employment status when her daughter was a teenager did not significantly influence the daughter’s fertility intentions; nor did their relationship differ in different countries (research hypothesis 5). In interpreting this finding we have to acknowledge that we lack information on whether the daughters perceived their mothers’ 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 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 in the direction of 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 her 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 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 when 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 allows us to treat separately 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 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 of the countries considered. This result is in contrast to 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 of the positive link between education and fertility intentions that goes beyond the alternatives of self-selection, partner effect, or time squeeze.

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