Intergenerational transmission of fertility in six European countries: the role of mother's socio-economic status

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

* Wittgenstein Centre (IIASA, VID/ÖAW, WU), International Institute for Applied Systems Analysis
** Wittgenstein Centre (IIASA, VID/ÖAW, WU), Vienna Institute of Demography/Austrian Academy of Sciences
*** Cracow University of Economics, Department of Demography

November 2013

Abstract

Using data from the Generation and Gender Survey on six European countries we study fertility intentions of women in reproductive ages by their mother's employment status when they were 15 years old. We expect mother's working experiences during childhood to be an important determinant of fertility intentions: especially for women in countries where female labour force participation is low, such as Italy, these women may better anticipate the conflict between work and family life than their counterparts whose mother was at home. The results point to a decisive role of mother's education in daughter's reproductive decision-making. The non significant experience of a working mother in explaining fertility intentions of the daughter can be due to the high level of correlation between mother educational level and employment status. Hence, in the further steps, we will investigate on disentangling these two effects. These preliminary findings suggest that the influence of mother's socio-economic status on daughters' fertility decision-making is particularly strong in Italy as compared to the other European countries considered.

Introduction

Intergenerational transmission of fertility is recognized as a driving mechanism of fertility intentions (Fernandez & Fogli, 2006). These, in turn, are one of the most relevant determinants of achieved fertility (e.g. Barber, 2001; Bongaarts, 1992). Yet, research on how fertility intensions are formed (e.g. Billari et al., 2009) and revised over life (e.g. Heiland et al., 2008; Iacovou & Tavares, 2011; Liefbroer, 2009) has given little attention to the impact of the family of origin on the formation of individual childbearing intentions in adulthood. On the one side, the literature has often viewed intergenerational transmission of fertility in terms of sib-ship size (i.e., women with more siblings are expected to have more children). On the other side, several recent analyses have considered labour supply and fertility as a joint decision (see Del Boca & Locatelli, 2006 for a discussion).

In this article we focus on the role that the experience of having had a working mother may have in shaping the daughters' fertility intentions when they reach reproductive ages. This study lies at the intersection between the theory of planned behavior (Ajzen, 1991) and the principle of linked lives (Elder, 1977; 1994) according to which parents' behavior and the parents-child relationship during children's childhood and adolescence significantly influence both desires and behaviors of the children in adulthood. Intergenerational relationships have been playing an increasingly important role in the last decades in ageing countries: while horizontal ties within generations have tended to decrease, the duration of family ties across generations has been greatly increasing. As a consequence, young female adults may take their mother's experience - in terms of having worked during their children's adolescence, for example, - as a model either to aim for or to avoid.

Using data from the "Generation and Gender Survey" (GGS) conducted between 2003 and 2009, we perform a cross-country comparative analysis on intergenerational transmission, between mothers and daughters, of work and family life.

We expect that fertility intentions of adult daughters are affected by whether their mothers were working when they were teenagers. In particular, these daughters may be more able to anticipate the challenges of combining work and family life than women who had their mother at home during their teens. Women whose mother was employed during their teenage learned from the mother's experience. 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". Socialization theories (Acock & Bengtson, 1980; Glass et al., 1986; Starrels & 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 through imitation of the parents, children learn and intergenerational transmission is indirect. The positive correlation found in intergenerational transmission of behaviours such as fertility patterns across successive generations has been explained with socialization and observational learning (Liefbroer & Elzinga, 2012; Murphy & Wang, 2001).

The cross-country approach considers six European countries that differ from each other in terms of female labour force participation, welfare systems, family policies and their combination. The analysis focuses on the following countries: Austria, Bulgaria, Georgia, Germany, Italy, and Norway. A substantial increase in women's activity rates in all these countries over the last 40 years has narrowed cross-country differences. Still, most recent data report that about 77 % of Norwegian women between 20 and 64 years old are employed and similar figures are reported for Austria (70.3%) and Germany (71.5%). The corresponding figure for Italy, slightly above 50 %, is one of the lowest in Europe (Del Boca & Vuri, 2007). Bulgaria and Georgia have an in-between position, with about 60 % of women employed.

This comparative setting enriches the literature on intergenerational transmission of fertility by accounting for country-specific cultural preferences within the four main family models in (Northern – Norway -, Southern – Italy -, Central – Austria and Germany - and Eastern – Bulgaria and Georgia -) Europe. The Italian context, characterized by very low female employment and based on a "familistic" welfare system that gives a key role to the woman (Esping-Andersen 1999), is a particular case study: the rigidity in the labour market tends to simultaneously increase the costs of having children and to discourage the labour market

participation of married women (Del Boca, 2002). In fact, having had a working mother in Italy is an exceptional case, while in Austria, Germany and Norway this was already the norm thirty years ago. Therefore, we expect to find a stronger association between mother' employment status and daughter's reproductive intentions in Italy than in the other countries considered, where the combination of work and family life is more supported by the institutions and family policies. Additionally considering Eastern European countries – Bulgaria and Georgia – accounts for contexts where the family has a central role in the life of individuals and women participation to the labour market is high.

The current analysis also indirectly relates to the effects of rising female employment, growing opportunity costs from childbearing and technological changes that have increased women's relative productivity levels (Black & Spitz-Oener, 2010; Thévenon & Horko, 2009). The increase in female labour force participation has been projected to continue to increase in the coming years (Euwals et al., 2011).

Negative associations between fertility and female labour force participation have been found, also in the countries that have among the highest level of female employment (Matysiak & Vignoli, 2008; Skirbekk, 2008). Women with higher education and greater employment tend to have on average, smaller families, which could also influence the amount of time provided to each child and the intensity of parent-child contact (Adserà, 2005; Buchanan & Rotkirch, 2013). However, later born women may increasingly see less incompatibility between part- or full-time work and fertility, as suggested by analyses of Norwegian womens' employment in the 1990s and 2000s (Rønsen & Kitterød, 2012).

This study is relevant because it sheds new light on the intergenerational transmission of fertility intentions and, indirectly, of fertility behaviours. It is also innovative in considering not only sibship size, but also the work-fertility joint behavior of the mothers when the daughters where adolescent, integrating it in a cross-country comparative approach.

Data and method

Data

We use data from the "Generation and Gender Survey" (GGS), carried out from 2002 as part of the Generation and Gender Programme (GGP, www.ggp-i.org), in 19 countries. It aims to improve our understanding of the relationship between parents and children and between partners throughout their life-course.

We restricted the analysis on women in reproductive age and focused on six European countries: Austria, Bulgaria, Georgia, Germany, Italy and Norway[1]. The data were collected between 2003 and 2009 (the data collection slightly differs from country to country). The working sample counts 13,055 women aged 20 to 49.

---

[1] The key variable for this study (i.e. mother's occupational status at teen age of the daughter) was not available for the other countries included in the GGS.

Our study is based primarily on two dependent variables, derived from the question about intention to have an (additional) child, worded as follows: "*Do you intend to have a(nother) child at all?*". Possible answers were: "*Definitely yes; probably yes; probably not; definitely not; does not know*"; and the question "*How many more children do you want to have?*" where respondents were asked to give a numerical answer.

The key explanatory variable refers to the occupational status of the respondent's mother when the respondent was 15 years old: "*What was your mother's occupation when you were 15?*" The possible answers were coded as in ISCO 88 classification (for Austria, Bulgaria, Georgia, and Norway), designed by the International Labour Organization (ILO, www.ilo.org), or in country specific codes (for Germany and Italy). To allow cross-country comparability of the explanatory variable in our analysis, we constructed a binary variable which has value 1 if the mother was 'working' and 0 otherwise (including both unemployed and inactive). Further, as robustness check we will carry out the same analysis by country, considering only Italy and Germany for whom detailed information on the employment status of the mother when the daughter was 15 years old is available. This information was complemented by that on father's occupational status when respondent was 15 years old. GGS data also include information on the educational attainment of both parents and of the partner.

Control variables in all the estimated regressions include age of respondent and partner, number of children, marital status (married, never married, divorced or widowed), whether respondent lives with parents, time since respondent left parental home (= 1 if respondent has never lived for more than 3 months separately from the parents; 0 otherwise), and employment status of the respondent (working, unemployed, inactive, student, other). Country dummies are also included in all the models where the six countries are considered together.

The descriptive statistics of the variables considered in the multivariate analysis of this paper are shown in Table 1.

Table 1. Distribution of the various characteristics, by country. Percentage or mean (M).

	AT	BG	GE	DE	IT	NO
Mother's education: *Low*	49.5	45.2	27.0	35.5	86.6	33.1
Medium	44.3	42.0	58.0	54.6	10.9	48.5
High	6.2	12.8	15.0	9.9	2.5	18.4
Mother's employment status at respondent's age 15: *Working*	55.1	92.2	55.5	59.7	36.5	72.7
Not working (= housewife + others)	44.9	7.8	44.5	40.3	63.5	27.3
Housewife	-	-	-	40.2	62.1	-
Other	-	-	-	0.1	1.4	-
Age (M)	35.2	34.4	37.5	37.5	38.5	36.7
Education: *Low*	14.2	17.2	7.5	24.4	39.3	14.7
Medium	68.0	54.1	64.9	60.6	48.4	40.7
High	17.8	28.7	27.6	25.0	12.3	44.6
Employment status: *Working*	67.9	63.3	37.8	61.7	57.7	76.3
Unemployed	4.8	20.6	17.2	8.6	5.2	1.3
Inactive	18.0	10.4	40.4	23.6	30.5	9.2
Student	8.6	5.3	4.6	5.7	5.8	11.1
Other	0.7	0.4	0.0	0.4	0.8	2.1
Marital status: *Single*	21.1	21.5	25.6	20.0	29.3	25.2
Married	31.9	43.3	41.7	42.6	44.0	28.6
Never married	38.3	28.1	25.9	29.7	22.9	39.3
Widowed or divorced	8.7	7.1	6.8	7.7	3.8	6.9
N. of children: *0*	29.8	22.3	17.8	23.1	24.7	22.9
1 child	13.9	28.7	18.7	25.5	21.7	10.1
2 children	36.1	41.4	44.4	33.7	43.3	35.6
3+ children	20.2	7.6	19.1	17.7	10.4	31.4
N. siblings: *0*	7.1	12.6	4.2	15.5	11.1	3.5
1 sibling	29.9	61.5	30.8	32.8	34.6	29.5
2 siblings	27.7	14.8	30.0	25.3	24.3	35.7
3+ siblings	35.3	11.1	35.0	26.4	30.0	31.3
Lives with parent(s)	12.8	25.3	22.2	5.2	20.4	4.0
Years since left parental home (M)	16.5	16.3	19.0	17.5	17.0	18.5
Partner's characteristics						
Age (M)	39.7	39.0	42.9	40.8	44.2	41.7
Education: *Low*	23.0	24.9	6.9	20.0	48.0	18.2
Medium	56.2	58.3	65.0	49.6	40.9	47.1
High	20.8	16.8	28.1	33.4	11.1	34.7
Father's characteristics						
Education: *Low*	30.2	44.1	28.8	13.7	82.3	27.5
Medium	61.1	44.3	53.1	61.2	13.4	49.5
High	8.7	11.6	18.1	25.1	4.3	23.0
Employment status at respondent's age 15: *Working*	93.7	98	99	98.3	95.4	88.9
Not working	6.3	2.0	1.0	1.7	4.6	11.1
N	1,768	3,410	1,882	2,010	1,898	2,087

Source: GGS, authors' calculations.

Model

We use a Zero-Inflated Poisson (ZIP) model to estimate the predictors of women's fertility intentions. The response variable is the number of additional intended children. The key covariate is a dummy variable indicating whether the woman has had a working mother at teenage.

Given that the variable "number of additional children the respondent wants to have" has a count nature and it is likely to have many zeros, a Zero-Inflated Poisson (ZIP) model is recommended (e.g. Lambert, 1992). This model assumes that some zeros might occur in accordance to the standard Poisson distribution (therefore, they are expected in the process), while others might be "unexpected" and lead to the excess of zeros. These latter are modeled as having a Binomial distribution with the probability of occurrence equal to *p*. The first zeros are usually called *poisson* or *imperfect zeros* and the second one are called *perfect zeros*.

ZIP is an example of a statistical model (one distribution) which fits simultaneously two separate regressions. That is, the model has two states: The "zero state" is the regression for probability *p* of being in *perfect* state (the most common is the logit 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 main advantage that follows from the properties of the ZIP model is the possibility to consider the different effect of the covariates for different states.

The formula for the ZIP model, assuming *n* independent variables Y_i (i = 1, 2, …, *n*) can be represented as follows:

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

The regressions for zero and count states are included in the following form:
$$p_i = \frac{\exp(x_i\gamma)}{1 + \exp(x_i\gamma)}, \quad \lambda_i = \exp(w_i\delta), \quad i = 1,..., n,$$

where x_i and w_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 logistic regression, while the coefficients from the count state have the same interpretation as in a standard Poisson regression.

In our specific case, perfect zeros derive from the intention not to have a(nother) child; while imperfect zeros are related to women who hesitate with the intention about (additional) childbearing, but still answers zero as number of (additional) children they want to have.

Results

Table 2 reports the estimates from zero and count states regressions where all the explanatory and control variables mentioned above are included. We will also carry out models step by step, where only woman's characteristics are included at first, then partner's characteristics, and in a third step mother's characteristics will be included. The zero state column shows the effects on the negative intention of having an (additional) child, that is: a negative coefficients means higher intention to have an (additional) child. The count state column shows the effects on the likelihood of intending to have a larger family (i.e. number of children intended): a higher coefficient reflects an intention of having a higher number of children.

6

In the zero model, a negative sign of the coefficients indicates a higher chance of intending to have (additional) children. Hence, the zero model points to a positive effect of mother's education on daughters' intention to have (additional) children, which holds true even after controlling for daughter's own level of education. The positive effect of mother's education on daughter's intention to have a(nother) child sums up to the positive effect of daughter's own level of education. Models not including respondent's education (not reported here) would show larger and more strongly significant (negative) coefficients for mother's educational levels.

The coefficient for mothers' inactivity at daughters teenage is not statistically significant in the zero model. However, the results from the Poisson regression reported in the count state column show that having had a working mother at teenage negatively affects the intention to have a higher number of children in Italy, as suggested by the interaction effect between mother's employment status (working vs. not working) and the dummy variable for Italy.

In this model, woman's education has a positive effect on the number of children intended: the higher the education, the more likely it is that a woman intends to have children and, once the intention is positive, it is also more likely that she intends to have a higher number. If respondent's education is not included in the model, the effect seems to be captured by the educational level of the mother.

As robustness check, we have also carried out two separate models on Italy and Germany. These two countries allow a more detailed categorisation of the labour market participation of the mother, distinguishing between working, housemaker, and not working. This analysis confirms the results of Table 2 and highlights a larger positive effect of mother's education on daughters' intentions to have an (additional) child. Similarly, the respondent's education has a larger and stronger effect in Italy than in Germany. Moreover, having had a housewife mother in Italy has a statistically significant positive effect on women's intention of having a(nother) child. This effect is not significant in Germany.

It is additionally worth to notice that the higher the education of the partner, the higher the intention to have children (results not reported in Table 2). Interestingly, when looking at the number of (additional) children the woman intends to have, the level of education of the partner has a depressive effect, contrasting the effect of the own education. This result could be affected also by a high correlation between woman's education and partner's education. Further analysis will be carried out to understand this result.

Table 2. Estimates from within zero and count state regressions. Model run on the pooled dataset including six countries (Austria, Bulgaria, Georgia, Germany, Italy and Norway). Sample: 13,055 women aged 20 to 49

	ZERO		COUNT	
Mother's education (Ref. low)				
medium	-0.274	*	-0.037	
high	-0.708	**	0.054	
Mother's employment status at respondent's age 15 (ref. working)				
Not working	0.057		0.013	
Respondent's education (Ref. low)				
medium	-0.478	**	0.090	*
high	-0.916	***	0.145	**
Respondent's employment status (Ref. working)				
unemployed	0.139		-0.054	
inactive	-0.328	*	-0.223	***
student	-1.001	*	0.035	
N. siblings (Ref. 0)	-0.002		0.048	***
N. children (Ref. 0)	1.076	***	-0.048	
Country (Ref. Austria)				
Bulgaria	0.136		-0.039	
Germany	0.718	***	0.091	+
Georgia	0.509	**	-0.263	***
Italy	-1.535	***	0.160	+
Norway	1.950	***	0.065	
Interactions				
Not working mother * Italy	-0.363		0.159	*
mother's middle education * Italy	-0.356		-0.080	
mother's high education * Italy	-0.335		-0.165	

Source: GGS, authors' calculations. *Note*: controls included are: age of respondent, marital status, living with parents and time since left parental home, father's education, father's employment status at respondent's age 15, age of partner, partner's education. Only significant interaction effects are included in the model above and the interaction between mother's education and Italy because of its relevance in this study.

Preliminary conclusion

This study derives from the research on intergenerational transmission of fertility. In particular, we aimed at adding to the literature more understanding of the impact of the family of origin on the formation of individual childbearing intentions in adulthood. This article focuses on the role that the experience of having had a working mother may have in shaping the daughters' fertility intentions when they reach reproductive ages. The analysis uses data from the "Generation and Gender Survey" (GGS) in six European countries.

The results so far point to a decisive role of mother's education in daughter's reproductive decision-making, while the experience of a working mother seems not to be much relevant. This preliminary result can be due to the high level of correlation between the two variables, i.e., mother educational level and employment status. Hence, in the further steps, we will investigate on disentangling these two effects.

These preliminary findings suggest that the influence of mother's socio-economic status (i.e. education and participation to the labour market) on daughters' fertility decision-making is particularly strong in Italy as compared to the other European countries considered.

References

Acock, A. C., & Bengtson, V. L. (1980). Socialization and attribution process actual versus perceived similarity among parents and youth. Journal of Marriage and the Family, 42(3), 501-515.

Adserà, A. (2005). Vanishing children: From high unemployment to low fertility in developed countries. *American Economic Review, 95*(2), 189–193.

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

Barber, J. S. (2001). Ideational influences on the transition to parenthood: Attitudes toward childbearing and competing alternatives. *Social Psychology Quarterly, 64*,101–27.

Billari, F. C., Philipov, D., & Testa, M. R. (2009). Attitudes, norms and perceived behavioural control: Explaining fertility intentions in Bulgaria. *European Journal of Population, 25*, 439-466.

Black, S. E., & Spitz-Oener, A. (2010). Explaining women's success: Technological change and the skill content of women's work. *Review of Economics and Statistics 92*(1), 187–194.

Bongaarts, J. (1992). Do reproductive intentions matter? *International Family Planning Perspectives, 18*, 102–108.

Buchanan, A, & Rotkirch, A. (2013). Fertility rates and population decline: No time for children? Houndmills: Palgrave Macmillan.

Del Boca, D. (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, D., & Locatelli, M. (2006). The determinants of motherhood and work status: A survey. *IZA Discussion Paper No. 2414*. Available at SSRN: http://ssrn.com/abstract=947056

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

Elder, G. H., Jr. (1977). Family history and the life course. *Journal of Family History, 2*(4), 279-304.

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

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford: Oxford University Press.

Euwals, R., Knoef, M., & van Vuuren, D. (2011). The trend in female labour force participation: What can be expected for the future? *Empirical Economics, 40*(3), 729–753.

Fernandez, R., & Fogli, A. (2006). Fertility: the role of culture and family experience. *Journal of the European Economic Association, 4* (2-3), 552-561.

Glass, J., Bengtson, V. L., & Dunham, C. C. (1986). Attitude similarity in three-generation families: Socialization, status inheritance, or reciprocal influence? American Sociological Review, 51(5), 685–698.

Heiland, F., Prskawetz, A., & Sanderson, W. C. (2008). Are individuals' desired family sizes stable? Evidence from West German panel data. *European Journal of Population, 24*, 129-156.

Iacovou, M., & Patrício Tavares, L. (2011). Yearning, learning, and conceding: Reasons men and women change their childbearing intentions. *Population and Development Review, 37*, 89–123.

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

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

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

Matysiak, A., & Vignoli, D. (2008). Fertility and women's employment: A meta-analysis. *European Journal of Population, 24*(4), 363–384.

Murphy, M., & Wang, D. (2001). Family-level continuities in childbearing in low-fertility societies. *European Journal of Population, 17*(1), 75-96.

Rønsen, M., & Kitterød, R. H.. (2012). Entry into work following childbirth among mothers in Norway. Recent trends and variation. *Discussion Paper 702*. Research Department of Statistics Norway. Available at http://ideas.repec.org/p/ssb/dispap/702.html

Skirbekk, V. (2008). Fertility trends by social status. *Demographic Research 18*(5), 145–180.

Starrels, M. E., & Holm, K. E. (2000). Adolescents' plans for family formation: Is parental socialization important? *Journal of Marriage and the Family, 62*(2), 416–429.

Thévenon, O., & Horko, K. (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, E. (1992). Family structure, gender and parental socialization. *Journal of Marriage and the Family, 54*(2), 368–378.