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Intergenerational transmission of fertility outcomes in Spain

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Abstract

The aim of this paper is to analyze whether parents' fertility behavior may be an important determinant of the future fertility outcomes of their children in Spain. To address this issue, we use data from the Survey of Living Conditions. Our results confirm the intergenerational transmission of fertility behavior in Spain. The higher the parents' number of children, the higher the number of children that individuals have. We find that individuals from regions where parents have few children may have 0.02 fewer children, because of differences in parental fertility, than those individuals living in regions whose parents have a large number of children, which represents 7% of the difference in fertility across regions.

KEYWORDS
fertility, intergenerational transmission, Spain

JEL CLASSIFICATION
D10; J13; Z13

1 | INTRODUCTION

In the last years, the total fertility rate has fallen significantly in many countries and does not appear to be bottoming out. In Spain, it has dropped to worrying levels below the replacement rate, set at 2.1 children per woman in the majority of regions, but not in all. In some of them, the fertility rate has remained quite high. Moreover, those regions with the lowest fertility rates during the 1970s are the

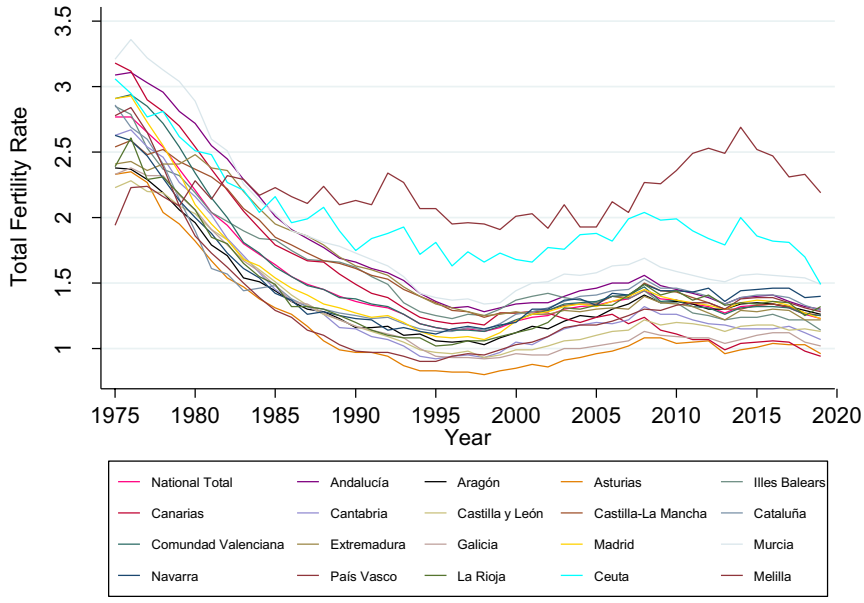

FIGURE 1 Evolution of the Spanish Total Fertility Rate by region from 1975 to 2019. Data come from the Spanish Statistical Institute

same showing the lowest rates in 2019, and the same occurs in those with the highest fertility rates (see Figure 1). This leads us to wonder whether national laws, institutions and economic conditions are the only factors affecting fertility outcomes, or whether the fertility culture may also be important.

Several studies have contributed to understanding the progressive decline in the fertility rate, focusing on the increase in the participation of women in the labor market (Ahn & Mira, 2002; Brewster & Rindfuss, 2000; Engelhardt et al., 2004), the increased opportunity cost of women's time (Becker, 1981), technological progress (Greenwood & Seshadri, 2002), the decline in infant mortality rates (Doepke, 2005), the reform of the laws that have made birth control and abortion more accessible (Ananat et al., 2007; Goldin & Katz, 2000, 2002; Guldi, 2008), the public debt (Fanti & Spataro, 2013) and the introduction of reforms in divorce laws (Bellido & Marcén, 2014), among others. In this paper, we study the intergenerational transmission of fertility outcomes in Spain by focusing on culture as one possible channel through which parents affect their offspring's behavior.

Using methodologies analogous to ours, there are recent papers showing the vertical transmission (that is, from parents to their children), of teenage smoking (Rodríguez-Planas & Sanz-de-Galdeano, 2019), entrepreneurial activity (Ferrando-Latorre et al., 2019), body mass (Dolton & Xiao, 2017), housework time (Marcén & Morales, 2019), unemployment status (Morales, 2019) and homeownership status (Morales, 2020), labor supply and socioeconomic status of women (Muchomba et al., 2020; Salari, 2020; Zhang & Li, 2017). Our work is related to prior studies that examine the effect of culture on fertility decisions (Bellido et al., 2016; Booth & Kee, 2009; Chabé-Ferret, 2019; Fernández & Fogli, 2006, 2009; Marcén et al., 2018; Salari, 2018; Vogl, 2020). All these researchers provide evidence of the existence of fertility culture in several countries. However, few studies focus on understanding the mechanisms through which this culture is transmitted. In this paper, we analyze the vertical transmission of fertility outcomes from parents to their children, for the specific case of Spain.

In our empirical strategy, we use data from the Survey of Living Conditions (2011) provided by the Spanish Statistical Institute, for the latest year, providing information about the household

characteristics when individuals were teenagers. We study the transmission of fertility outcomes over two generations by analyzing whether individuals' fertility behavior is related to that of their parents. We find a positive and statistically significant relationship between the parent's number of children and the number of children their daughters and sons have in the future. We also find that belonging to a large family when individuals were teenagers increases the probability of having three or more children in adulthood. The cultural effect, although it is statistically significant, appears to be quite small since we find that an increase of one in the parents' mean number of children, raises the number of children by as much as 0.09, and by 0.04. Moreover, coming from a large family makes an individual 3–10 percentage points more likely to have three children or more. Our results are unaffected after controlling for unobservable characteristics by region, including region fixed effects and using different subsamples. We can interpret our findings as evidence of the intergenerational transmission of fertility outcomes in Spain.

The remainder of the paper is organized as follows. Section 2 presents the empirical strategy, Section 3 describes the data, our results are discussed in Section 4 and Section 5 concludes.

2 | EMPIRICAL STRATEGY

In our empirical strategy, we use parents' fertility outcomes as our measure of fertility culture.[1] As suggested in Furtado et al. (2013), parents instill in their children beliefs and preferences representing their cultural heritage. Thus, if there is no vertical transmission of fertility behavior in Spain, parents' number of children, should not be related to the future number of children of their daughters and sons. Moreover, if culture transmitted through parents to their children does play a role in fertility outcomes, we would expect to detect a relationship between parents' behavior and that of their children during their adulthood. To test this issue, we estimate the following model:

$$Y_{ik} = \beta_0 + \beta_1 PF_i + \boldsymbol{X_{ik}}\beta_2 + \delta_k + \epsilon_{ik} \quad (1)$$

where Y_{ik} is a measure of the fertility outcomes of individual i, living in the region k. In the first analysis, our dependent variable is the number of children that individuals have. In a second analysis, that variable is defined as the probability of having three or more children. Similarly, the definition of our variable of interest, that is, parents' fertility outcomes (PF_i), changes depending on the objective of our analysis. First, we define this variable as the parents' number of children and second as a dummy variable that takes value 1 if an individual was raised in a large family, and 0 otherwise.[2] The vector $\boldsymbol{X_{ik}}$ includes individual characteristics, such as gender, age and level of education.[3] Controls for unobserved characteristics of the areas of residence are added using region fixed effects, denoted by δ_k.[4] Standard errors are clustered at the regional level to account for any within-group correlation in the error terms.

[1]We define large families as those with three or more children in the household. Individuals from 2-partner households with, at least, one child under the age of 18 years old, have been included in our sample.

[2]Following Marcén and Morales (2019), we use a linear probability model for the sake of simplicity. Our results are maintained by applying a probit model when using a dichotomous dependent variable.

[3]Our results are maintained after controlling for additional individual characteristics in Table 3.

[4]One data limitation is that we assume that individuals in our sample live in the same region they were born since we do not have information on whether they migrated. In any case, since culture changes slowly our results should be the same after migration (Marcén et al., 2018).

TABLE 1 Summary statistics

Region	Mean number of children	Proportion of large families	Parents' mean number of children	Proportion of parents' large families	Mean Age	Proportion of Males	Proportion of individuals having completed primary school	Proportion of individuals having completed secondary school	Proportion of individuals with university degree	Obs
Andalucía	1.74	0.11	2.12	0.40	41.97	0.49	0.15	0.53	0.31	772
Aragón	1.57	0.05	1.99	0.28	42.67	0.49	0.09	0.55	0.35	319
Asturias	1.57	0.06	2.09	0.38	43.57	0.48	0.07	0.58	0.36	228
Canarias	1.62	0.09	2.08	0.39	43.17	0.49	0.17	0.47	0.32	264
Cantabria	1.64	0.10	1.87	0.23	42.98	0.47	0.10	0.54	0.35	175
Castilla y León	1.67	0.06	2.11	0.38	44.12	0.50	0.13	0.52	0.34	395
Castilla-La Mancha	1.76	0.10	2.06	0.33	42.52	0.50	0.10	0.59	0.30	418
Cataluña	1.66	0.11	2.13	0.35	42.60	0.48	0.16	0.45	0.34	648
Ceuta	1.94	0.19	2.42	0.53	40.47	0.51	0.21	0.48	0.27	77
Comunidad Valenciana	1.62	0.09	2.01	0.31	42.27	0.49	0.07	0.60	0.32	560
Extremadura	1.83	0.11	2.16	0.42	44.08	0.49	0.18	0.50	0.31	252
Galicia	1.61	0.06	1.97	0.30	42.93	0.49	0.08	0.46	0.45	261
Illes Balears	1.63	0.08	2.14	0.35	41.54	0.48	0.13	0.62	0.24	191
La Rioja	1.70	0.10	2.20	0.43	42.10	0.48	0.10	0.59	0.31	226
Madrid	1.69	0.11	2.07	0.37	43.37	0.49	0.06	0.45	0.48	612
Melilla	2.06	0.38	2.00	0.25	37.56	0.38	0.25	0.63	0.06	16
Murcia	1.74	0.10	2.01	0.33	41.01	0.49	0.18	0.57	0.24	258
Navarra	1.73	0.10	2.17	0.40	43.34	0.49	0.11	0.37	0.52	241
País Vasco	1.61	0.08	2.02	0.32	44.14	0.48	0.07	0.34	0.59	369
Mean	1.68	0.09	2.08	0.36	42.77	0.49	0.12	0.51	0.36	
SD	0.64	0.29	0.79	0.48	7.10	0.50	0.32	0.50	0.48	

Note: The sample contains 6,282 observations of individuals aged 26–60.

3 | DATA

We use data from the Survey of Living Conditions (SLC) of 2011, provided by the Spanish Statistical Institute, for the latest year providing information about parents' characteristics when respondents were teenagers.[2] The SLC provides rich information that allows us to identify the current number of children under the age of 18 living in the household, as well as that during individuals' adolescence. Thus, we are able to study how respondents' fertility behavior correlates with that of their parents.[3] We restrict our sample to those individuals having children. Our main sample contains 6,282 observations of individuals aged 26–60.[4]

Table 1 presents the summary statistics for the main variables by region. The first two columns show large variations in fertility behavior across the Spanish regions, ranging from around two children per individual and 38% of large families in Melilla to an average of 1.57 children and only 5% of large families in Aragón. The data reveal that individuals have 1.68 children in Spain on average and only 9% of the individuals in our sample belong to a large family. The raw data also show variations in parents' fertility outcomes across the Spanish regions, ranging from around 2.42 children per individual and 53% of large families in Ceuta to an average of 1.87 children and only 23% of large families in Cantabria (see columns 3 and 4). Comparing these columns with the first two, we can deduce, although not in all regions, a relationship between the fertility behavior of individuals in our sample and that of their parents. Fewer differences are observed in terms of age and gender composition. Male adults are 49 percent of the sample and the age of the individuals is around 43 years, on average. The raw data reveal some dissimilarities across regions in the level of education. Overall, 12 percent of individuals have completed primary school, with the lowest percentage being from Madrid (6%) and the highest from Melilla (25%). Regarding those who have completed at least secondary school, the lowest percentages are observed among those from País Vasco (34%) and the highest among those from Melilla (63%). Finally, 36% of respondents report having completed a university degree, with this ranging from just 6% in the case of individuals from Melilla to 59% in the case of those from País Vasco.

4 | RESULTS

Table 2 presents the estimated coefficients for Equation (1). As the existing literature shows, the higher the level of education, the lower the number of children that women decide to have (Marcén et al., 2018). This mainly occurs because of the increase in the opportunity costs of time for those more educated individuals (Becker & Barro, 1988). The impact of age follows an inverted U-shape, achieving the maximum at 44 years old, which is in line with the literature, suggesting that the older the individuals, the more likely are those individuals to have a greater number of children (Marcén et al., 2018). With respect to our variable of interest, the higher the parents' number of children, the higher the number of children that individuals have (see column 1). However, this relationship

[2]The Survey of Living Conditions is part of a harmonized European Data set conducted by Eurostat.

[3]We define the number of children that individuals have as those under the age of 18 living in the household. Similarly, we use the number of children under the age of 18 present in the household when respondents were teenagers to measure parents' number of children. We also recognize that desired fertility may not coincide with completed fertility outcomes.

[4]Data on household characteristics when individuals were teenagers can be found in the Intergenerational Transmission of Poverty section provided by the SLC, which is only available for this age group.

TABLE 2 Main results

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	**Number of children**	**Large family**	**Number of children**	**Large family**	**Number of children**	**Large family**
Parents' number of children	0.043***		0.040***		0.047***	
	(0.010)		(0.011)		(0.011)	
Parents' large family		0.028***		0.022**		0.033***
		(0.009)		(0.008)		(0.009)
Parents' number of children × Low educated			0.055***			
			(0.017)			
Parents' large family × Low educated				0.085**		
				(0.036)		
Parents' number of children × Male					−0.008*	
					(0.004)	
Parents' large family × Male						−0.011*
						(0.006)
Age	0.180***	0.029***	0.179***	0.028***	0.181***	0.029***
	(0.014)	(0.004)	(0.014)	(0.005)	(0.014)	(0.004)
$Age^2/100$	−0.205***	−0.033***	−0.203***	−0.031***	−0.205***	−0.033***
	(0.016)	(0.005)	(0.016)	(0.005)	(0.016)	(0.005)
Male	−0.013*	−0.003	−0.012	−0.004		
	(0.007)	(0.003)	(0.008)	(0.002)		
Primary school	−0.587***	−0.366***			−0.587***	−0.367***
	(0.088)	(0.057)			(0.088)	(0.058)
Secondary school	−0.639***	−0.393***			−0.639***	−0.393***
	(0.089)	(0.062)			(0.089)	(0.062)
University degree	−0.630***	−0.377***			−0.630***	−0.377***
	(0.091)	(0.067)			(0.091)	(0.067)
Constant	−1.739***	−0.217**	−2.332***	−0.566***	−1.748***	−0.218**
	(0.304)	(0.093)	(0.306)	(0.098)	(0.303)	(0.093)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
p value (*F*-test of Parents' number of children + Parents' number of children × Low educated = 0)			0.000			
p value (*F*-test of Parents' large family + Parents' large family × Male = 0)				0.016		
p value (*F*-test of Parents' number of children + Parents' number of children × Low educated = 0)					0.001	

(Continues)

TABLE 2 (Continued)

Dependent variable	(1) Number of children	(2) Large family	(3) Number of children	(4) Large family	(5) Number of children	(6) Large family
p value (*F*-test of Parents' large family + Parents' large family × Male = 0)						0.019
Observations	6,282	6,282	6,282	6,282	6,282	6,282
R^2	0.069	0.043	0.058	0.018	0.069	0.043
Adjusted R^2	0.065	0.039	0.054	0.015	0.065	0.039

Note: The sample, obtained from Spanish Living Conditions Survey 2011, consists of individuals with children aged 26–60. Estimates are weighted using SLC person weights. Robust standard errors, clustered by region, are in parentheses.

***Significant at the 1% level; **Significant at the 5% level; *Significant at the 10% level.

appears to be quite small. We find that if the parents' mean number of children increases by one, there is an increase of around 0.04 children born to the individuals in our sample. Living in a large family during adolescence is also related to a higher probability of having three or more children in the future. We find that being raised in a large family increases the probability of belonging to a large family in the future by around 3 percentage points (see column 2). Comparing regions, individuals from regions where parents have few children (for example, Cantabria), would have 0.02 fewer children, because of the fertility culture, than those individuals living in regions whose parents have a large number of children (for example, Ceuta), which represents around 7% of the difference in fertility across the two regions. While the effect of parental family size would be around 0.08 children in the first case, it would be approximately 0.10 in the second case. Moreover, a one standard deviation increase in parents' number of children explains about 5% of the standard deviation of the number of children. Because of the fertility culture transmitted from their parents, individuals from Cantabria (the average proportion of parents with three or more children is 0.23) are also about 1 percentage point less likely to have three or more children than those living in Ceuta (the average proportion of parents with three or more children is 0.53).

A greater relationship is found when we analyze whether the intergenerational transmission of fertility outcomes changes depending on the level of education. To take this issue, we add a term of interaction between our cultural proxy and a dummy variable taking value 1 when the respondent is low educated, and zero otherwise, in columns 3 and 4. Parents' fertility behavior appears to play a major role among low-educated individuals, with the magnitude of the cultural effect being much greater than that obtained before. We find that if the parents' mean number of children increases by one, there is an increase of around 0.09 children to the low-educated individuals in our sample, and coming from a large family increases the probability to have a large family in the future by around 10 percentage points. Although we use a gender-balanced sample, we have also explored whether it is the family size of males or females that plays a greater role. To take this issue, a term of interaction between the male dummy and parents' fertility outcomes has been included in columns 5 and 6. As can be seen, the magnitude of the effect seems to be slightly higher in the case of females, pointing to a more important role of parental family size in fertility outcomes among females than males.[5]

[5]These results are consistent with prior literature showing a higher effect of culture among females and low educated individuals (Marcén & Morales, 2019).

To reinforce our results, we run some robustness checks in Table 3. In columns 1 and 2, we repeat our analysis by a sample of individuals older than 40 years old. Those individuals constitute an interesting sample in our analysis, since variations in the number of children born would be expected to be quite insignificant. We find that the impact of parents' fertility behavior remains statistically significant and positive. The set of individual and household characteristics has been enlarged in columns 3 and 4. As prior researchers show, marital status, female unemployment status, or economic characteristics of the household can affect fertility decisions (Ahn & Mira, 2003; Bellido & Marcén, 2014; Booth & Kee, 2009; Guner et al., 2019; Lopes, 2020). Thus, we include dummy variables to control for whether the female partner in the household is unemployed, for whether individuals are currently married, for whether they live in a household at risk of poverty and for whether they are homeowners. As can be seen, our coefficient of interest remains statistically significant even after including all these controls in both columns.[6] We can reach the same conclusion when we add additional controls for the regions in columns 5 and 6. We introduce GDP per capita, female labor force participation and the unemployment rate.[7] It is worth noting that the inclusion of this set of observable characteristics, which can also influence fertility outcomes (Ahn & Mira, 2002; Brewster & Rindfuss, 2000; Engelhardt et al., 2004), does not alter our estimates.

To mitigate the concerns about exactly what is being picked up by the estimated coefficient on parents' fertility outcomes, we include controls for some parents' characteristics in our estimates. That coefficient could be capturing the effect of other socio-economic or demographic factors in addition to, or instead of fertility outcomes. As Duarte et al. (2018) suggest, there is an intergenerational transmission of poverty in Spain which may be partly explained by the transmission through parents to their children of the level of education. They find that the probability that individuals have completed secondary level of education is positively and significantly correlated with the fact that the parents had completed that same level. Using an empirical strategy similar to us, there are also other papers showing evidence of the intergenerational transmission of homeownership and labor market outcomes (Morales, 2019, 2020). Thus, this analysis is necessary to disentangle the effect of parental family size from the effect of other parents' socio-economic outcomes. Following Booth and Kee (2009), we incorporate in our analysis dummy variables to control for whether respondents' parents were high educated, for whether they were homeowners, for whether they lived in a poor household, for whether they were unemployed and for their age when the respondent was born (see columns 7 and 8). It is comforting that our results are unaltered after their inclusion, which gives us additional empirical evidence that not only do laws and institutions affect fertility behavior, but also that fertility culture may play a role.

Finally, the use of a truncated sample, excluding individuals without children, can also generate some concerns since our conclusions would only be applicable to those who have children. Thus, we have repeated our analysis by a sample of both, individuals with and without children. To explore this issue, we propose the same methodology as in Marcén et al. (2018). This is only necessary when we consider the number of children as our dependent variable. We use a Tobit model (Tobin, 1958) that allows us to take into account both outcomes, having or not children, and if so, how many children individuals have.[8] Results are reported in Table 4. Our results are maintained after adding individuals without children to our sample, which reinforces our previous conclusions.

[6]Unfortunately, the data set has many limitations since it does not provide some household control variables provided in other surveys.

[7]Data come from the Spanish Statistical Institute.

[8]The use of a different methodology is not necessary when the dependent variable is a binary variable. Thus, we analyze the probability of being raised in a larger family using a linear probability model as before.

TABLE 3 Simple robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	**Number of children**	**Large family**	**Number of children**	**Large family**	**Number of children**	**Large family**	**Number of children**	**Large family**
Parents' number of children	0.033***		0.035***		0.043***		0.035**	
	(0.008)		(0.012)		(0.010)		(0.015)	
Parents' large family		0.033**		0.022**		0.028***		0.024***
		(0.012)		(0.008)		(0.008)		(0.008)
Age	0.148	0.029	0.169***	0.027***	0.181***	0.029***	0.186***	0.031***
	(0.087)	(0.032)	(0.015)	(0.005)	(0.015)	(0.004)	(0.015)	(0.005)
$Age^2/100$	−0.176*	−0.033	−0.191***	−0.030***	−0.206***	−0.033***	−0.211***	−0.034***
	(0.088)	(0.032)	(0.016)	(0.006)	(0.017)	(0.005)	(0.017)	(0.006)
Male	0.055***	0.012**	−0.014*	−0.005*	−0.013*	−0.003	−0.012	−0.005
	(0.016)	(0.004)	(0.007)	(0.002)	(0.007)	(0.003)	(0.013)	(0.004)
Primary school	−0.505***	−0.318***	−0.473***	−0.315***	−0.582***	−0.365***	−0.532***	−0.322***
	(0.116)	(0.077)	(0.063)	(0.046)	(0.086)	(0.057)	(0.081)	(0.057)
Secondary school	−0.516***	−0.337***	−0.483***	−0.328***	−0.639***	−0.392***	−0.585***	−0.348***
	(0.121)	(0.081)	(0.077)	(0.053)	(0.087)	(0.060)	(0.090)	(0.062)
University degree	−0.393***	−0.295***	−0.442***	−0.299***	−0.630***	−0.376***	−0.594***	−0.350***
	(0.125)	(0.088)	(0.077)	(0.057)	(0.090)	(0.066)	(0.094)	(0.066)
Married			0.242***	0.044***				
			(0.057)	(0.015)				
Currently household at			0.274***	0.093***				
risk of poverty			(0.037)	(0.027)				
Unemployed female			−0.127***	−0.042***				
			(0.029)	(0.010)				

(Continues)

TABLE 3 (Continued)

Dependent variable	(1) Number of children	(2) Large family	(3) Number of children	(4) Large family	(5) Number of children	(6) Large family	(7) Number of children	(8) Large family
Homeowner			−0.024	−0.030				
			(0.045)	(0.021)				
GDP pc					0.014**	0.006***		
					(0.007)	(0.002)		
Unemployment rate					10.801***	3.897***		
					(3.330)	(1.172)		
Female labor force					−0.010*	−0.002		
participation					(0.006)	(0.001)		
High educated mother							−0.090	−0.012
							(0.061)	(0.028)
High educated father							0.234***	0.111***
							(0.061)	(0.026)
Unemployed father							−0.135	−0.028
							(0.300)	(0.127)
Unemployed mother							−0.314	−0.084***
							(0.407)	(0.016)
Parents lived in a poor household							0.014	0.005
							(0.025)	(0.027)
Father's age when R was born							0.007**	0.002
							(0.003)	(0.001)
Mother's age when R was born							−0.006*	−0.003*
							(0.003)	(0.001)

(Continues)

TABLE 3 (Continued)

Dependent variable	(1) Number of children	(2) Large family	(3) Number of children	(4) Large family	(5) Number of children	(6) Large family	(7) Number of children	(8) Large family
Constant	−1.124	−0.291	−1.862***	−0.275*	−1.719***	−0.287**	−1.939***	−0.286**
	(2.142)	(0.754)	(0.340)	(0.134)	(0.331)	(0.113)	(0.297)	(0.112)
Region fixed effects	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Observations	3,827	3,827	6,190	6,190	6,282	6,282	5,674	5,674
R^2	0.065	0.037	0.107	0.061	0.065	0.041	0.079	0.048
Adjusted R^2	0.058	0.030	0.103	0.056	0.063	0.040	0.073	0.042

Note: The sample, obtained from Spanish Living Conditions Survey 2011, consists of individuals with children aged 26–60. Individuals older than 40 years have been included in columns 1 and 2. The variation in the sample size in columns 3 and 4 is due to the no availability of partners' employment status for all individuals in our sample. The variation in the sample size in columns 7 and 8 is due to the no availability of information for all individuals on parents' age when respondent was born. Estimates are weighted using SLC person weights. Robust standard errors, clustered by region, are in parentheses.

***Significant at the 1% level; **Significant at the 5% level; *Significant at the 10% level.

TABLE 4 Using a sample of both, individuals with and without children

	(1)	(2)
Dependent variable	**Number of children**	**Large family**
Parents' number of children	0.089***	
	(0.024)	
Parents' large family		0.015***
		(0.005)
Age	0.921***	0.024***
	(0.022)	(0.002)
$Age^2/100$	−1.083***	−0.027***
	(0.024)	(0.002)
Male	−0.179***	−0.003**
	(0.028)	(0.001)
Primary school	−0.176	−0.111***
	(0.302)	(0.038)
Secondary school	0.057	−0.116**
	(0.324)	(0.041)
University degree	0.078	−0.108**
	(0.345)	(0.045)
Constant	−19.318***	−0.362***
	(0.595)	(0.065)
Region fixed effects	Yes	Yes
Observations	13,792	13,792
R^2		0.026
Adjusted R^2		0.024

Note: We use a Tobit model in column 1 and a linear probability model in column 2. A sample of individuals with and without children is used in both columns. Estimates are weighted using SLC person weights. Robust standard errors, clustered by region, are in parentheses.

***Significant at the 1% level; **Significant at the 5% level; *Significant at the 10% level.

Overall, all the results described in this paper suggest that individuals' fertility outcomes correlate with those of their parents. However, the magnitude of this relationship appears to be quite small, since increases in parents' fertility outcomes raise the number of children by as much as 0.09, and by 0.04, and the probability of belonging to a large family 3–10 percentage points. These results are in line with those obtained in prior literature. Using American and British data, both Marcén et al. (2018) and Booth and Kee (2009) find that when their cultural proxy increases by one, there is an increase of around 0.08 children born to individuals in their samples. Similar results are presented in Vogl (2020). Using a collection of nationally representative samples he associates increases in fertility in previous generations with 0.04–0.10 increases in the number of children per women. Moreover, our results on larger families are similar to the French case, since the estimated coefficients presented in Chabé-Ferret (2019) suggest that higher fertility norms increase the rate of having a third child by around 10 percent points. Our findings and those presented in the papers mentioned above point to the

existence of a smaller cultural effect than that obtained using less recent data in Fernández and Fogli (2009), which may due to a possible decline in the intergenerational transmission of fertility behavior.

5 | CONCLUSIONS

In recent decades, there has been a considerable decline in the Spanish fertility rate of many regions, with that reaching levels below the replacement rate set at 2.1 children per woman, whereas in other regions it has remained quite high. The aim of this paper is to explore whether these interregional differences may be due to fertility attitudes transmitted vertically, that is, from parents to their children. This study suggests that individuals' fertility behavior may be partly determined by their parents' previous fertility outcomes. Specifically, our results show that the higher the parents' number of children, the higher the number of children that individuals have. Moreover, individuals living in a large family during childhood are more likely to have a large family in the future. Our findings also point to a more important role of parental family size in fertility outcomes among females and low-educated individuals.

Although statistically significant, the magnitude of the vertical transmission of fertility culture is quite small, which shed line on future research on other possible mechanisms of transmission in Spain, such as the horizontal transmission, that is through neighbors or ethnic communities, which has been previously found in other countries (Marcén et al., 2018). Further research is also needed on whether it has changed over time. Prior researchers have shown a decrease in intergenerational linkages in Spain, such as mobility, and point to an increase in assortative mating among parents as one potential source of this decrease (Güell et al., 2015).

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