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# Parental religiosity and daughters' fertility: the case of Catholics in southern Europe

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**Abstract** Preferences, including preferences for children, are shaped during the formative years of childhood. It is therefore essential to include exposure to religious practice during childhood in an attempt to establish a link between religiosity and fertility. This path has not been explored in the documented literature that looks at the relationship between *current religiosity* and fertility. The International Social Survey Programme: Religion II (ISSP) provides the data base. It includes information on maternal/paternal/own mass participation when the respondent was a child (nine levels each), as well as on his current churchgoing (six levels) and prayer habits (eleven levels). These variables are included as explanatory variables in 'fertility equations' that explain the number of children of Catholic women in Spain and Italy. The core findings are that exposure to religiosity during the formative years of childhood, has a pronounced effect on women's 'taste for children' that later on translates into the number of her offspring. In Spain, the two parents have major opposite effects on women. Most striking is the negative effect of the mother's intensity of church attendance on her daughter's fertility: Women who were raised by an intensively practicing mother have on average one child less that their counterparts who were raised by a less religious mother. On the other hand, an intensively practicing father encourages the daughter to have more children (by

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about 0.8, on average). The Italian sample confirms the statistically significant negative effect of the mother's religiosity. The father's religious conduct has apparently no effect on Italian women's birth rates. Current religiosity seems to be irrelevant, both in Spain and in Italy. It follows that religiosity and fertility are interrelated but the mechanism is probably different from the simplistic causality that is suggested in the literature.

**Keywords** Fertility · Religion · Catholic · Church attendance · Prayer · Parental religiosity · Spain · Italy

**JEL Classifications** Z12 · J12 · J13 · D13

## 1 Introduction and motivation

The formation of 'social capital' and of 'religious capital' begins early with childhood experiences (Bisin & Verdier, 2000, 2001; Grotenhuis & Scheepers, 2001; Voas & Crockett, 2005). Dohmen, Falk, Huffman & Sunde (2006) provide evidence suggesting that preferences and attitudes towards risk and trust are determined by an individual's parents. It follows that preferences for children are also shaped during the formative years of childhood and adolescence. Given that pro-natalist religions endorse large families**,** it is essential to include parental religiosity and exposure to religious practice during childhood, in an attempt to establish a link between religiosity and fertility.

The relationship between religiosity and fertility is an issue of considerable interest on the background of two parallel trends that are in evidence in industrialized societies during recent decades: secularization and a significant decline in fertility. Spain and Italy are especially interesting cases given the dramatic change in the position of the Catholic Church and the extraordinary low fertility rates in recent years.[1]

The relationship between religiosity and fertility has been studied intensively. Research is mainly empirical and takes two directions: one examines differences in fertility between religions that coexist in the same country (e.g., Boroohah, 2004; Lehrer, 1996; Morgan, Stash, Smith, & Mason, 2002; Schellekens & van Poppel, 2006); and a second, more limited line, links differences in fertility within a given religion to the individual's current religious practice (e.g., Amin, Diamond, & Steele, 1997; Mosher & Hendershot, 1984; Neuman & Ziderman, 1986; Sander, 1992;). These two lines are intertwined- religious practice will influence fertility only if the religion has a pro-natalist ideology.

[1] In Spain: Birth rates dropped from 3 children in the mid 1950s, to 2.8 in 1975, and to a mere 1.2 in recent years. The very sharp drop started in 1975 (at the onset of democracy) and followed a constant sliding path till the late 1990s when it stabilized at a rate of 1.2 children (Fernández-Cordón, 1998a). In Italy: Birth rates dropped from 2.4 in 1970 to 1.2 in 2000 (Fejka & Westoff, 2006). The decrease in birth rates is evident in many other European countries, but Spain and Italy have suffered the sharpest changes (McDevitt, 1999; Sleebos, 2003; Perez & Livi-Bacci, 1992).

The documented studies look at the relationship between *current religiosity* and fertility (in pro-natalist religions). With few exceptions, the great majority of empirical studies employ one dichotomous variable of church attendance to measure religious practice, due to data constraints. This is a narrow definition that ignores the full range of church attendance frequencies, and it covers only the public institutional dimension of religious practice and ignores the more private dimensions such as prayer. Moreover, the use of current religious practice as a predictor of fertility is problematic because (a) current religiosity might be different from religiosity at the time when fertility decisions have been made; (b) reciprocal effects of fertility on religious attendance might be at work and the provision of religious training for children can be an important motivation for parental religious church attendance (Stolzenberg, Blair-Loy, & Waite, 1995; Thornton, Axinn, & Hill, 1992; Tilley, 2003).[2] Therefore interpreting the empirical association between the two domains as the causal effect of religion on fertility is too simplistic and leads to biased estimates of the effect of religiosity on family size.

The more relevant explanatory variable for reproductive behavior is *exposure to religious practice during childhood*, which will be the core variable in this study. It has not been included in previous research on the link between religiosity and fertility although it has been shown that church attendance during childhood is a key variable in explaining adult behavior. Examples are: marital status decisions (increasing the probability to marry and decreasing the prospects of cohabitation, Thornton et al. 1992) and adult church attendance (Brañas-Garza & Neuman, 2006; Grotenhuis & Scheepers, 2001). The numerous studies that examine fertility patterns have ignored parental religiosity and focused on personal socio-economic and demographic variables such as: labor force participation, occupation, education, age at marriage or current religiosity. This paper adds a new unexplored determinant of fertility.

In the late 1990s adequate data sets have become available. Under the International Social Survey Program: Religion II (ISSP), identical surveys have been conducted in various countries, including Spain and Italy. In these surveys respondents answered a questionnaire that included a series of socio-economic questions. The core segment of the survey includes a large set of detailed, objective questions on various dimensions of religiosity. The respondent is asked about current mass participation and prayer habits: ''how often do you attend church services (six alternative levels)?'' And, ''how often do you pray (eleven levels)?'' Three questions refer to the individual's exposure to churchgoing during childhood: ''how often did your mother/father attend mass services when you were a child (nine levels each)?'' and ''how often did you attend mass services when you were 12 years old (nine levels)?'' A battery of personal and demographic socio-economic background questions (e.g. number of household members (HM), marital status, age, education, personal income, household income, population size in place of residence, region) is also included.

[2] Similarly, reciprocal effects also exist between religiosity and other family behaviour dimensions such as: marriage; divorce; non-marital cohabitation; and premarital sex.

The estimation of 'fertility equations' that present the number of children as a function of parental/childhood mass attendance and of current religious practice (participation in mass services and prayer)[3] facilitates an examination of the effect of childhood religious experience, vis-à-vis the more popular explanatory variable of current religiosity. Differential effects of the social and private dimensions of current religiosity (mass attendance and prayer habits) are also explored. A better understanding of the link between parental religiosity and offspring's fertility can also lead to improved forecasts of future fertility patterns, against the background of current secularization.

## 2 Samples and variables

The Spanish and Italian samples used for the estimation of 'fertility equations' are composed of married Catholic women who were raised by two Catholic parents and have a Catholic husband. Parental and spousal religious denomination and, in particular different denominations of the two parents and the two partners, have been found to have crucial effects on family decisions (Grotenhuis & Scheepers, 2001; Lehrer, 1996; Voas & Crockett, 2005). Moreover, as Bisin and Verdier (2000) claim, the 'socialization technology' of homogamous families is more efficient than that of heterogamous families. Our homogenous samples therefore facilitate the focus on the relationship between religious practice and fertility among members of the pro-natalist Catholic religion.[4]

The ISSP has very detailed information on religiosity but does not have an explicit question on the number of children the respondent has. This core variable has been calculated using information on the number of HM as follows:[5]

$$\text{Number of children} = \text{HM} - 2\,(\text{respondent and her spouse})$$

The upper age limit of respondents was set to 45[6], to eliminate the possibility of children who got married and left their parents' household (children who move out of the household to go to school are counted as HM).[7] The sample includes married women but we do not know if it is their first marriage. In any case the children in the

[3] And also a series of socio-economic background variables that might affect fertility: age, education, region of residence and population size in place of residence.

[4] We do not look at inter-denominational comparisons. Such comparisons are more relevant in a pluralistic society- Spain and Italy have one major religion and almost 90% of the population is Catholic (see Brañas-Garza & Neuman, 2004, 2006, for a more detailed analysis for Spain; and Introvigne & Stark 2005, for Italy).

[5] The number of children was based on household composition data in several published studies (e.g. Kalwij, 2000; Wang & Famoye, 1997).

[6] To account for the fact that women in the sample may not have yet completed their childbearing age, the 'age' variable will be included in the regression analysis.

[7] Moreover, in Spain according to the Constitution, parents are obliged to pay for the education of their children, also of those children who are no longer minors (Picontó-Novales, 1997: 113).

household are their biological children because in these countries the family law give custody almost always to the mother and shared custody although legally admitted is very rare (Fernández-Cordón, 1998b: 82). The male sample is not examined to avoid a possibility that the children in the household are not the biological children of the respondent (e.g. the respondent is married to a woman who has children born during her previous marriage/s). Moreover, as the mother is the major care-giver in the household, fertility decisions are most probably related primarily to her preferences.

Measurement errors of the 'number of children' dependent variable are still possible. However, it should be noted that measurement errors of the dependent variable can be absorbed in the disturbance term of the regression and ignored (as long as the independent variables are measured properly) and the ordinary least squares (OLS) coefficient estimates are still unbiased and consistent (Greene, 2003: 84).[8]

The raw data sets include 2488 Spanish respondents (women and men) and 1008 Italian respondents. In the Spanish data set about 40% of respondents had missing observations on at least one of the key variables.[9] The respective figure in the Italian data base is about 25%.[10] Restriction of the samples, so that they include women who are married and younger than 46, cuts the samples to 232 Spanish and 138 Italian observations. Consistent with the homogenous religious makeup of the Spanish and Italian populations, only four Spanish women and six Italian women are not Catholic. A negligible number of the Catholic respondents in the two samples have a non-Catholic mother, father or spouse.[11] Limiting the samples to Catholic women, raised by Catholic parents and married to a Catholic spouse brings the samples down to 207 and 123 women, in the Spanish and Italian samples respectively. It follows also that using this constrained homogenous samples does not cause sample selection problems. Selectivity at the stage of the decision to marry seems irrelevant too because in these two Mediterranean traditional countries the foundation for family formation is marriage, cohabitation is uncommon and births outside marriage are very rare (Southern European countries and Ireland have the lowest cohabitation rates in Europe, see Oinonen, 2000: 6). Especially till the 1990s divorces were quite rare in Spain and Italy. Spain and Italy demonstrate the

[8] Assume that the true regression model is $y = bx + u$ and the observed $y$ (denoted by $y^*$) has a measurement error, so that $y^* = y + e$. It follows that the estimated regression model is $y^* = bx + u + e$. As long as the measurement error in $y^*$, which is $e$, is not correlated with $x$, OLS yields unbiased and consistent estimates.

[9] For instance: 431 respondents (17% of the total sample) did not report the number of years of schooling; 441 respondents (18%) did not answer the question on current participation in mass services; 248 respondents (10%) skipped the question of paternal mass attendance.

[10] For instance: 108 respondents (11% of the total sample) did not report the number of years of schooling; 98 respondents (10%) did not answer the question on paternal mass attendance.

[11] In the Spanish data set: Three women report a non-Catholic mother, nine had a non-Catholic father and 12 women are married to a non-Catholic spouse. In the Italian sample: one had a non-Catholic mother, two had a non-Catholic father and seven are married to a non-Catholic spouse.

**Table 1** Childhood and Current Religiosity, Young Catholic Spanish and Italian Women, 1998

| Levels | Childhood mass attendance (%) | | | Current (%) | |
|---|---|---|---|---|---|
| | Of mother | Of father | At twelve | Mass | Prayer |
| *Spanish sample* | | | | | |
| Rare | 18.3 | 29.5 | 9.2 | 66.3 | 44.9 |
| Occasional | 27.1 | 35.7 | 21.7 | 19.3 | 34.8 |
| Intensive | 54.6 | 34.8 | 69.1 | 14.4 | 20.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| *Italian sample* | | | | | |
| Rare | 13.0 | 30.0 | 3.2 | 0.00 | 23.6 |
| Occasional | 20.3 | 35.0 | 9.8 | 56.9 | 42.3 |
| Intensive | 66.7 | 35.0 | 87.0 | 43.1 | 34.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Notes*: The samples include Catholics who grew up in households with two Catholic parents and are married to a Catholic spouse. Age is restricted to 45

For the definition of the levels, see next page

Sample size is 207 for Spain and 123 for Italy

lowest divorce rates in Europe (Oinonen, 2000: 6). In the samples of women younger than 46 years there are also few widowed, divorced and separated women. Inclusion of these three categories in the estimation samples leads to a minor increase in sample size, but could lead to selectivity biases. Albeit small, the samples seem to be representative of the populations at the age group under discussion (in terms of number of children, education and region of residence), as indicated by the sample characteristics presented in Appendix Table 1.

The distributions of the number of children in the two samples are presented in Appendix Table 2. The number of children in the Spanish sample ranges from 0 to 7, with an average of 1.89 (SD is 1.38), while Italian women have 0 to 5 children, with an average of 1.71 (SD is 1.07).[12] Within the Spanish sample: About 15% have no children, around one quarter have one child, the mode is two children (30%), close to 20% are mothers of three children, around 5% have four children and a mere 5% are mothers of five children or more. The respective figures for the Italian sample are: 13% (no children), one quarter (one child), 44% (two children, the mode), 11% (three children) and 5% have four or five children.

[12] The sample averages in the two countries are larger than the birth rate in 1998 (that was 1.2 children, both in Spain and in Italy), because the samples include respondents who gave birth during the last 3 decades, when birth rates were higher.

Descriptive summary statistics on the various dimensions of religiosity that are employed in our statistical analysis of fertility are presented in Table 1, that includes summary figures of parental mass attendance and the individual's mass attendance when she was 12 years old,[13] along with information on current mass attendance and current prayer habits.[14]

For each of the three childhood variables there is data on a scale of 1 to 9 (1—never attended church services, to: 9—attended several times a week). Dummy variables are defined, reducing the nine options to three categories: rarely-, occasionally- and intensively-participating in mass services:

(1) *rare* = 1: For original values of: 1 (she/he never attended); 2 (once a year); and 3 (one or two times a year). This category relates to very low-practicing Catholic mothers/fathers/children.
(2) *occasional* = 1: For original values of: 4 (attended few times at year); 5 (once a month); and 6 (two or three times a month). This category includes medium-level practicing Catholic mothers/fathers/children.
(3) *intensive* = 1: For original values of: 7 (attended almost all weeks); 8 (every week); and 9 (several times a week). This is a category that is composed of intensively-practicing Catholic mothers/fathers/children.

Similarly, dummy variables for current participation are defined:

(1) *mass-rare* = 1: For original values of: 1 (she never attends); 2 (once a year); and 3 (one or two times a year).
(2) *mass-occasional* = 1: For original values of: 4 (attends once a month); and 5 (two or three times a month).
(3) *mass-intensive* = 1: For original value of: 6 (every week).

The three categories are comparable to the respective categories for childhood variables. They are not identical, due to the different number of options that each has.

In a similar vein, the three broad categories for prayer habits are:

(1) *pray-rare* = 1: For original values of: 1 (she never prays); 2 (once a year); 3 (one or two times a year); and 4 (few times a year).

[13] Based on the ISSP questions, for the mother/the father/and the child at the age of 12: ''When you were a child (or, 12 years old, for own childhood mass attendance), how often did your mother/ father/yourself attend mass services at the church?'' The options are: Never (1); once a year (2); one or two times a year (3); a few times a year (4); once a month (5); two or three times a month (6), almost every week (7); every week (8); several times a week (9).

[14] Current church attendance is derived from the following ISSP question: ''How often do you attend mass services at the church?'' The answer includes 6 alternative options: Never (1); once a year (2); one or two times a year (3); once a month (4); two or three times a month (5); and, every week (6). Prayer habits are derived from the question: ''How often do you pray?'' The possible answers are: never (1); once a year (2); twice a year (3); few times a year (4); once a month (5); two or three times a month (6); almost every week (7); every week (8); several times a week (9); once a day (10); and several times a day (11).

(2) *pray-occasional* = 1: For original values of: 5 (prays once a month); 6 (two or three times a month); 7 (almost every week); 8 (every week); and 9 (several times a week).
(3) *pray-intensive* = 1: For original values of: 10 (prays every day); and 11 (several times a day).

As Table 1 indicates, parental mass participation levels are quite similar in Spain and in Italy. In the two countries there are gender differences. Over 50% of the mothers, and over one third of the fathers were intensively attending mass services. Less than 20% of mothers and 30% of fathers rarely went to church. The respondents themselves (when they were twelve years old) were even more active than their parents- 69% of Spanish female children and 87% of Italian girls were attending mass services intensively (with their parents or with the school, that was in most cases a Catholic school).

There is a decrease in religious practice of the offspring compared to the mothers, and a very pronounced difference between mass participation of adult respondents compared to their childhood religious experience. This change is much more dramatic in Spain: Only 14% of Spanish women go currently to church on a regular basis and two thirds rarely attend mass services. Spanish women also practice less than their fathers**.** The Spanish sample includes women who are 22–45 years old. This means that the observed huge decline took place in Spain during a relatively short time period. The youngest respondents are only ten years past the age of twelve while the oldest are about three decades beyond their childhood experience. This very significant inter-generational change stems from the rapid secularisation of Spanish society (Brañas-Garza, 2004) and from the weakening of the network effect of participation in church services. The social gains from churchgoing diminished significantly at the onset of democracy in 1975, when the link between state and Catholicism collapsed (Adserá, 2006a).

The women in the Italian sample seem to have only a slight inter-generational change: A smaller share goes to church on a regular basis (43% compared to 67% of the mothers) but the rest (56%) attend church services occasionally. They are also more religiously active than the fathers used to be. These figures are based on a very small sample. Interestingly, a much larger sample of 2,000 respondents who were surveyed in the 1999 World Values Survey reports very similar results: 40% say that they attend church services weekly[15] (Introvigne & Stark, 2005: 11, Table 2).

It follows that Italian women are much more religious than their Spanish counterparts: *All* women in the Italian sample go to church at least occasionally, compared to only one third of the Spanish women. Even more striking is the difference in the percentage of women who participate in mass services intensively (every week): 43% of Italian women compared to only 14% of Spanish women.

Our Spanish respondents are somewhat more active in the intimate activity of prayer. Twenty percent of women pray at least one time a day, whereas about 45% of women rarely pray. The rest pray occasionally. The survey does not include

[15] While our sample is composed of women younger than 46, this figure relates to a sample of the two genders with no age restrictions. Men are less active than women but on the other hand older individuals tend to be more active.

**Table 2** Fertility Equations, Young Catholic Spanish Women, 1998

| | | Equation #1 OLS | Equation #2 Poisson | Equation #3 OLS | Equation #4 Poisson |
|---|---|---|---|---|---|
| *Religious practice during childhood* | | | | | |
| Mother | Occasional | −0.408 (1.20) | −0.284 (1.23) | −0.381 (1.14) | −0.264 (1.17) |
| | Intensive | −1.044 (3.05) | −0.644 (2.68) | −1.006 (2.98) | −0.619 (2.62) |
| Father | Occasional | 0.421 (1.44) | 0.336 (1.62) | 0.387 (1.33) | 0.313 (1.51) |
| | Intensive | 0.791 (2.44) | 0.558 (2.39) | 0.754 (2.35) | 0.528 (2.28) |
| Child (at 12) | Occasional | 0.497 (1.35) | 0.283 (1.14) | 0.431 (1.18) | 0.236 (0.95) |
| | Intensive | 0.543 (1.60) | 0.281 (1.20) | 0.466 (1.39) | 0.231 (1.01) |
| *Current religious practice* | | | | | |
| Mass attendance | Occasional | −0.097 (0.40) | −0.054 (0.36) | – | – |
| | Intensive | −0.050 (0.17) | −0.025 (0.14) | – | – |
| Prayer habits | Occasional | −0.181 (0.84) | −0.122 (0.88) | – | – |
| | Intensive | 0.200 (0.80) | 0.090 (0.59) | – | – |
| *Socio-economic background* | | | | | |
| | Years of schooling | −0.027 (1.12) | −0.015 (1.00) | −0.020 (0.89) | −0.012 (0.84) |
| | Age 31 to 40 | 0.701 (3.35) | 0.445 (3.01) | 0.685 (3.33) | 0.433 (2.96) |
| | Age 41 to 45 | 1.024 (3.84) | 0.584 (3.35) | 1.071 (4.12) | 0.603 (2.58) |
| | Place of 10,000 or less inhabitants | 0.137 (0.65) | 0.069 (0.55) | 0.147 (0.70) | 0.075 (0.59) |
| Constant | | 1.331(2.58) | 0.256 (0.74) | 1.360(2.73) | 0.278 (0.82) |
| $R^2$ (Pseudo $R^2$) | | 0.3908 | (0.1067) | 0.3816 | (0.1034) |

*Notes*: The regressions also include region dummy variables (coefficients not reported)

Z-statistics in parentheses

Sample size is 207

The sample includes Catholic women (younger than 46), raised by two Catholic parents and married to a Catholic spouse

Reference groups (of dummy variables) are: for level of religiosity- rare; for age groups: age $\leq$ 30; for city size- more than 10,000 inhabitants; for region- Madrid

questions on parental prayer habits and an inter-generational comparison is therefore not possible. There is most probably a significant inter-generational change in this religious activity too. However, many young Spaniards still cherish the religious practice of prayer (see also Brañas-Garza & Neuman, 2006, for descriptive statistics on mass attendance and on prayer habits for a larger sample of Spaniards and for gender differences). Italian respondents are also practicing the private prayer habits more intensively: 76% pray at least occasionally (79% according to the 1999 World Values Survey, cited above) compared to 55% of Spanish women. This reinforces the conclusion that Italian women are more attracted by religion than their Spanish counterparts. The impressive rates of

participation of Italian women in religious activities, combined with a steady increase since the mid 1980s (Introvigne & Stark, 2005: 11–12), seem to indicate a religious revival in Italy.[16]

## 3 Fertility equations

The 'fertility equations' are estimated using two alternative regression models: Ordinary Least Squares (OLS) and the Poisson Regression Model. OLS estimation has been used in prior research on this topic (e.g. Adsera, 2006b; Lehrer, 1996). It has the advantage of self-explanatory intuitive coefficients. OLS assumes a continuous dependent variable. As the number of children is discrete and non-negative, 'count data models' seem to be more appropriate. Poisson regression belongs to the family of 'count data models' and it explicitly recognizes the non-negative integer character of the 'number of children' variable (for an extensive review of Count Data Models, see Winkelmann, 2000).[17] To tackle the irregularity of the zero children option (that could be the result of infertility, rather than choice; or a result of the decision to postpone reproduction), we also experimented with Zero Inflated Poisson (ZIP) models. It is used when the number of zero counts is higher than is expected in the regular model. ZIP employs two-stage estimation: First, a probit or logit process before the counting process begins, followed by a Poisson count model.

The independent variables in the 'fertility equations' include the following sets: (a) the core variables relate to exposure to religiosity during childhood when the individual's norms, attitudes and tastes were shaped. Reference to these variables is innovative and it appears that it has not been done before. Using the nine values of each of the three childhood religiosity dimensions as a quantitative continuous explanatory variable is problematic, because the responses to questions that relate to childhood are retrospective and might be inaccurate. Also, the use of a continuous variable of mass attendance is based on assumptions of similar distances between any two consecutive alternatives and a linear monotonic relationship between religiosity levels and fertility. Parental and childhood intensity of mass participation are therefore introduced by two dummy variables that relate to broader categories (occasional- and intensive-practice; with rare-practice as the reference group); (b) current religiosity that is expressed by two types of religious activity, mass participation and prayer. Dummy variables are used and are defined in a similar vein (occasional = 1, if is a medium-level mass/prayer practitioner; intensive = 1, if is practicing intensively; the reference group is rare = 1, if is rarely attending/praying). Here too, the use of dummy variables allows a non-linear and non-monotonic relationship. However, as these variables relate to current religiosity and therefore

[16] Introvigne and Stark, (2005) argue that this is due to more religious competition: ''The rapid development of a highly visible competitiveness in Italian relgious economy and the rise of competition *within* Roman Catolicism have spurred a substantial religious revival'' (p. 4).

[17] Such models have been used for the estimation of fertility regressions (e.g. Al-Qudsi, 1998; Mayer & Riphan, 2000; Winkelmann & Zimmermann, 1994;). The Journal of Population Economics devoted a special issue (13/2, 2000) to fertility studies using count data models.

are not subject to memory problems, the continuous variable version is also legitimate; (c) a set of socio-economic and demographic background variables: schooling, age groups, size of city of residence (10,000 or less = 1) and region of residence. The regions differ in their religious make-up that constitutes 'neighbourhood effects'; in public spending on health and education; and in female employment opportunities and unemployment rates. These regional characteristics that affect fertility are controlled by the region dummy variables. The Italian data set includes also a variable that relates to the type of place of residence (urban, metropolitan, rural), that will be added to the set of demographic control variables.

### 3.1 The Spanish sample

Table 2 presents fertility equations of the Spanish sample. Equations #1 and #2 include the three sets of variables for the OLS and Poisson types of estimation, respectively. Equations #3 and #4 exclude the current religiosity variables, to avoid biases that can be caused by the possible reciprocal effect of fertility on current religiosity.

*Exposure to religiosity during childhood*: Parental and childhood exposure to religious practices does affect significantly the number of children the woman has. The OLS regression (Equation #1) indicates that daughters of fathers who were intensively attending mass services, have on average 0.8 children more than daughters of rare- and occasional-practicing fathers (there is no significant difference between the effects of the two latter levels). This is a quite remarkable size, in view of the average number of children that is 1.89. The mother's level of religiosity has a pronounced *negative* effect on fertility. The regression coefficient indicates that respondents, who grew up in households where the mother was practicing intensively, have on average one child less compared to daughters of rare- and occasional-practicing mothers (the effects of the two latter levels are not significantly different). The paternal and maternal effects are not significantly different (in absolute values), but as the mothers were more religious than the fathers (see Table 1), it follows that the negative effect of the mother is more pronounced than the positive effect of the father.

The coefficients of the Poisson regression (Equation #2) tell a similar story: a negative coefficient for an intensively-practicing mother ($-0.644$, $Z = 2.68$, incidence rate ratio (irr) = 0.525); a positive coefficient for an intensively-practicing father (0.558, $Z = 2.39$, irr = 1.748); and also a marginally positive coefficient for an occasionally-practicing father (0.336, $Z = 1.62$, significant at 10.6%, irr = 1.400).

The more intuitive incidence rate ratios indicate that (everything else being constant) women who grew up with intensively practicing mothers will have about half the number of children compared to women who had either a rarely- or an occasionally-practicing mother. Women raised by a more religious father have larger families: if the father was an intensive practitioner, the daughter will have about 75% more children than in the case that he was rarely-practicing. Daughters of occasionally-practicing fathers have a birth advantage of about 40% (only

marginally significant). The basic results are similar in the two 'fertility equations' and indicate the very significant and opposite effects of maternal and paternal religiosity.

The parental effects are very robust and exhibit only minor changes when current religiosity variables are excluded. Equations #3 and #4 present the results of the OLS and Poisson regressions respectively. In the OLS version the maternal coefficient changed from −1.044 to −1.006, and the paternal parallel coefficient changed from 0.791 to 0.754, with almost identical significance levels. Minor changes are also exhibited by the Poisson version. The effect of an occasionally practicing father is now significant only at 13.1%. The incidence ratio rates changed from 0.525 to 0.538 and from 1.748 to 1.696 for the mother and father, respectively.

Experimentation with two-stage Zero Inflated Poisson regressions and with truncated (at zero) Poisson estimation did not change the basic results (not reported, can be obtained upon request).

The reversed effects of the father and the mother probably stem from different channels of influence on preferences and can be explained along the following lines: daughters of intensively practicing Catholic mothers had a model of a dedicated, submissive and self-sacrificing mother who was overloaded with work caring for a large family (at the cost of time and energy for herself). They might therefore have a high tendency to react negatively and opt for few children and a low load of household duties. Moreover, religious Catholic parents tend to educate their daughters in a very restrictive manner, within a family setting in which the father is the dominant figure with patriarchal power over the wife and children. This stereotypical orthodox education could also lead to a negative reaction and to the desire of the daughters to be different from their mothers (and also have fewer children). On the other hand, a practicing Catholic father is the head of the family and is perceived as a great educator- his teachings on the importance of a large family and of family values are respected and internalized by the daughters.[18] Women are therefore caught between two opposing forces that shape their preferences- they want to be different from their 'poor' mothers but they also want to follow the teachings of their respected fathers.

Own exposure to church services during childhood does not have a significant effect on fertility.[19] This result seems to be different from Thornton et al. (1992) who claim that church attendance during childhood predicts marital decisions. However, they did not include information on parental participation in mass services that is correlated with the child's participation, and possibly captures the effects of parental religiosity.

[18] Respect for the intensively practicing father will be further enhanced by the daughters if more religious men are nicer to their wives and give them higher 'quasi-wages' for their within-household activities (Grossbard-Shechtman, 1993).

[19] In Equation #1 it is marginally significant, at a significance level of 11.2%: Women who were intensively exposed to mass services have on average 0.5 children more than those who had a low- or medium- exposure.

**Table 3** Additional Fertility Equations, Young Catholic Spanish Women, 1998

| Explanatory variables | | Paternal practice excluded I | Maternal practice excluded II | Explanatory variables | Interactions of maternal-paternal religious practice III |
|---|---|---|---|---|---|
| *Religious practice during childhood* | | | | | |
| Mother's practice | Occasional | −0.084 (0.30) | – | Both parents practiced intensively | −0.197 (0.83) |
| | Intensive | −0.538 (2.08) | – | Only mother practiced intensively | −0.783 (3.39) |
| Father's practice | Occasional | – | −0.023 (0.10) | Only father practiced intensively | −0.219 (0.43) |
| | Intensive | – | 0.141 (0.55) | – | – |
| Child (at 12) practice | Occasional | 0.572 (1.62) | 0.513 (1.39) | Child practiced occasionally | 0.533 (1.61) |
| | Intensive | 0.647 (1.99) | 0.348 (1.02) | Child practiced intensively | 0.553 (1.75) |
| $R^2$ | | 0.3618 | 0.3423 | | 0.3817 |

*Notes*: The regressions also include all other explanatory variables that are included in Regression #3 of Table 2 (coefficients not reported)

Z-statistics in parentheses

Sample size is 207

The sample includes Catholic women (younger than 46), raised by two Catholic parents and married to a Catholic spouse

Reference groups (of dummy variables) are: for level of religiosity- rare; for interactions of maternal and paternal religiosity: both parents did not practice intensively. Not practicing intensively includes rare practice and occasional practice

The rich ISSP data set that includes maternal, paternal and own mass participation levels facilitates the distinction between the differential effects of these measures. The three childhood religiosity variables are correlated[20] and therefore an exclusion of any of them will result in biased estimates of the effects of the included variables that will now capture also the effect of the omitted variable.

On the other hand the inclusion of all three variables (and in particular the father's and the mother's religious practice that have the largest correlation coefficient, ($r = 0.6807$) could lead to multicollinearity problems. Multicollinearity may possibly result in statistical insignificance of the coefficient(s) of the correlated variables, due to the 'inflated' size of its standard deviation. However, in our case the effects of paternal and maternal religiosity are nevertheless significant, indicating reliable effects of the mother's and father's religiosity on the daughter's fertility.

[20] The correlation coefficients between the paternal, maternal and child's mass participation levels (nine levels) are: 0.6807 between the mother's and father's levels; 0.5464 between the mother's and child's church attendance levels; and 0.4578 between the father's and the child's respective levels.

To get more insight, Table 3 presents additional fertility equations that include the religious practice of one parent only (regressions I and II)—this solves the multicollinearity problem but results in biased estimates, due to omitted variable problems, as will be illustrated by the results. Alternatively, the multicollinearity problem is removed by including (in regression III) mutually exclusive categories of *interactions* between maternal and paternal religious practice (the two parents practiced intensively; mother practiced intensively and father not; father practiced intensively and mother not; with the reference category of: both did not practice intensively).[21] The drawback of this regression is that the separate effects of the mother and the father can not be isolated readily.

Regression I excludes the father's intensity of church attendance. The effect of an intensively practicing mother is still negative and significant (Z = 2.08) but the size of the coefficient decreases to −0.538 (down from −1.006), thus capturing the positive lesser effect of paternal religiosity. When maternal mass participation is excluded from Equation II, the influence of an intensively practicing father becomes insignificant (Z = 0.55). This biased coefficient captures the negative strong effect of maternal omitted religiosity and reflects the positive net coefficient of the father that is now cancelled out by the negative net effect of the mother.

Regression III includes three mutually exclusive categories of parental joint practice, with the reference category of 'the two parents were not practicing intensively'. The negative and statistically significant coefficient of a very religious mother and a less religious father (coefficient = −0.783, Z = 3.39 for the interaction variable of an intensively practicing mother married to a father who did not practice intensively, i.e. he attended mass services either rarely or occasionally) indicates the negative effect of a highly religious mother. The effect of an intensively practicing mother who lived with an intensively practicing father is statistically insignificant (Z = 0.83), apparently due the opposite effects of the mother and the father that cancel out each other. These additional regressions have more evidence for the negative effect of maternal religiosity, while they do not support (but do not reject either) the positive influence of the father. The innovative core finding of this study, that demonstrates the negative effect that a Catholic religious mother has on her daughter's number of children, seems to be very robust.

The ISSP database does not include data on other parental socio-economic variables, in particular parental education, that might shape the 'taste for children'. Previous literature has found a negative relationship between religiosity and secular education, thus possibly leading to an omitted variables bias. However, it is possible to speculate on the direction of the bias and claim that including mother's education (that seems to be more relevant than the father's education because the mother is the main care-giver) would lead to a stronger negative coefficient of the 'intensively practicing mother' variable: combining the two assumptions that (a) more religious mothers are also less educated and (b) less educated mothers tend to shape the taste for more children, leads to the conclusion that the reported effect of an intensively practicing mother captures also the *positive* effect that low maternal education has

[21] We also experimented with interaction terms between maternal/paternal and child's intensity of practice- the basic core results did not change.

on the daughters' fertility. The reported coefficient of maternal religiosity is therefore underestimated and an inclusion of maternal schooling would have resulted in a more negative coefficient.

*Current religiosity variables*: Turning back to Table 2: The coefficients of current mass participation and current prayer habits are insignificant (at a 5% significance level), in the two estimation versions (Equations #1, #2). They are also insignificant when the two variables are introduced as continuous variables; when only current religiosity variables are included; and when only one dimension of religiosity (either mass participation, or prayer habits) is included (not reported, can be obtained from the authors). These findings suggest that current religious behaviour does not predict the number of children in the family. Our findings are different from what is found in Adserá (2006b) who also studied the Spanish population. She used the Spanish Fertility Survey (SFS) that was conducted in 1999 (only one year after our 1998 survey) and includes women who are 15–49 years old (not very different from our upper age limit of 45).[22] Adserá too examined marital fertility and found that Spanish Catholic practicing women have significantly more children than non-practicing women- the fertility differential is about 0.1 children. The different results could stem from the different definition of the religiosity variable- 'practicing Catholic' is a subjective measure that is not well defined and could be perceived differently by different respondents. We are using instead a much more objective and well-defined measure, namely, the frequency of participation in mass services (and the frequency of prayer). In any case the difference in birth rates of practicing- versus non-practicing Catholics is extremely low and Adserá too basically finds a negligible difference. The SFS does not have information on parental and childhood religiosity that seems to be the core variable in the linkage between religiosity and fertility (for commentary on Adserá, 2006b, see Neuman, 2007).

*Socio-economic and demographic background*: The effect of schooling on fertility is not statistically significant. Experimenting with a non-linear version that included both schooling and schooling squared (assuming a parabolic relationship) led to statistically insignificant coefficients of the two variables. A third specification, that used dummy variables for levels of schooling, also yielded statistically insignificant results.[23]

Obviously, age is positively correlated with the number of children. Older couples are also married for more years and could have more children: The OLS results indicate that women who are in the age group of 31 to 40 have 0.7 kids more than women who are under the age of 31 (the reference group). At the age of 41 to 45 the number of children further increases by 0.4 kids (1.1 more compared to the age group of 30 or under). The parallel incidence ratio rates that are estimated by the Poisson regression are 1.560 and 1.793 (based on the coefficients of 0.433 and 0.603), showing fertility increases of 56% and 79%, if the woman is in the second or

[22] Experimenting with larger upper age limits did not lead to different results.

[23] It is sometimes claimed that the dramatic raise in Spanish women's educational attainments that took place during the last 30 years is responsible for the decline in birth rates (e.g. Adserá, 2006a). Our 'fertility equations' do not support this hypothesis.

third age group (respectively), compared to the youngest reference age group. The inclusion of 'age' also controls for in-completed fertility of the younger women in the sample and controls for the 'exposure' period in the Poisson regression.[24]

The positive age coefficients might also reflect cohort effects- the constant decline in the desired number of children over time. Using birth cohort dummy variables (birth cohort 1: born 1948–1959, the reference group; birth cohort 2: born 1960–1968; birth cohort 3: born 1969–1980) instead of age groups (following Tilley, 2003 and Adserá, 2006b), did not change the basic results.

The population size in the place of residence does not affect fertility rates. The insignificant coefficient might result from opposing effects that probably cancel each other out- on the one hand residents of small, rural and more traditional cities are expected to have higher fertility rates. On the other hand, bigger cities have usually better facilities, in particular education and health services, which encourage parents to have more children.

Inclusion of household income and/or personal income led to a major drop in sample sizes (due to many missing values) and yielded insignificant effects of these variables (probably as a result of the small samples).

The region dummies control for the different public policies and institutions of the seventeen regions of Spain (with Madrid as the reference region). They reflect the effects of macro-economic variables such as the regional unemployment rate and job insecurity; regional facilities of health and education; and the regional religious make-up that leads to social and religious norms and pressures (coefficients not reported, can be obtained from the authors).[25]

### 3.2 The Italian sample

The regression analysis described in the previous section has been replicated using the Italian sample. Both OLS and Poisson regressions have been used. Experimentation with the various versions has been repeated, including the multicollinearity checks. To save space and avoid repetitive discussions, only the basic OLS fertility equations will be presented.

Table 4 presents three OLS fertility equations: All the equations include religious practice during childhood that is represented by dummy variables for maternal, paternal and own mass participation. Own mass participation at the age of twelve has only one dummy variable of 'intensive practice' because the two other categories of rare and occasional practice have been combined due to the very small size of each of them (see Table 1).

[24] Alternatively the 'exposure' option can be used in the Stata Poisson estimation. Specifying: exposure (lnage), while excluding the age independent variables, did not change the basic results.

[25] The region dummy variables have a major contribution to the explanatory power of the regressions: when they are excluded from the regressions, $R^2$ drops to about half its size (not reported). The basic results that relate to the religiosity variables do not change (there are minor changes in the size and significance of coefficients. None of the insignificant variables becomes significant and the significant coefficients stay significant).

**Table 4** Fertility Equations, Young Catholic Italian Women, 1998

| | | Equation #1 | Equation #2 | Equation #3 |
|---|---|---|---|---|
| *Religious practice during childhood* | | | | |
| Mother | Occasional | −0.758 (1.98) | −0.866 (2.27) | −0.805 (2.12) |
| | Intensive | −0.734 (1.93) | −0.843 (2.21) | −0.797 (2.10) |
| Father | Occasional | −0.038 (0.14) | −0.046 (0.17) | 0.039 (0.15) |
| | Intensive | 0.146 (0.51) | 0.116 (0.40) | 0.162 (0.56) |
| Child (at 12) | Occasional | NA | NA | NA |
| | Intensive | 0.158 (0.50) | 0.127 (0.41) | 0.256 (0.85) |
| *Current religious practice* | | | | |
| Mass attendance | Occasional | NA | – | – |
| | Intensive | −0.372 (1.85) | – | – |
| | Continuous | – | −0.175 (1.52) | – |
| Prayer habits | Occasional | −0.001 (0.00) | – | – |
| | Intensive | 0.098 (0.36) | – | – |
| | Continuous | – | 0.037 (1.08) | – |
| *Socio-economic background* | | | | |
| | Years of schooling | −0.079 (3.15) | −0.080 (3.18) | −0.081 (3.21) |
| | Age 31 to 40 | 0.790 (3.22) | 0.781 (3.18) | 0.852 (3.55) |
| | Age 41 to 45 | 0.701 (2.48) | 0.688 (2.44) | 0.768 (2.79) |
| | Place of 10,000 or less inhabitants | 0.448 (1.68) | 0.363 (1.38) | 0.397 (1.52) |
| | Urban | 0.376 (1.48) | 0.332 (1.31) | 0.349 (1.38) |
| Constant | | 2.472 (4.86) | 3.143 (4.03) | 2.318 (4.62) |
| $R^2$ | | 0.2507 | 0.2460 | 0.2262 |

*Notes*: The regressions also include the region of residence (coefficients not reported)

Z-statistics in parentheses

Sample size is 123

The sample includes Catholic women (younger than 46), raised by two Catholic parents and married to a Catholic spouse

Reference groups (of dummy variables) are: for maternal/paternal mass participation- rare; for own mass participation at 12—rare or occasional (the two categories have been combined due to the very small size of each of them); for current mass participation- occasional (the category of rare practice is empty); for current prayer- rarely prays; for age- 30 or less; for urban- metropolitan

In Equation #1 current religiosity is defined by dummy variables that represent categories of current religious activity. Current mass participation is represented by a single category of 'intensive practice' because 'rare practice' is an empty group and therefore the reference group is 'occasional practice'. This equation replicates Equation #1 of the Spanish sample (Table 2).

Equation #2 employs the continuous version of the current religiosity measures. Equation #3 excludes the current religious practice and is corresponding to Equation #3 in Table 2. A series of socio-economic and demographic control variables is also included in the regressions: number of years of schooling; age groups; population

size in place of residence (10,000 inhabitants or less = 1); type of place of residence (urban = 1); and region (northwest, northeast and central, with south as the reference category).

*Exposure to religiosity during childhood*: As is evident from Table 4, in Italy too, the mother's religiosity has a statistically significant *negative* effect on the daughter's fertility. Women who were raised by religious mothers who attended mass services either occasionally or intensively, have on average 0.8 less children than their counterparts who had a rarely practicing mother. As the average number of children in the Italian sample is 1.71 (lower than the Spanish average of 1.89), a difference of 0.8 is quite impressive. Unlike the Spanish case, where only an intensively practicing mother had a negative effect on fertility, the Italian sample indicates similar negative effects of mothers who practiced occasionally and intensively.

The negative link between the Italian mother's religiosity and her daughter's fertility can be explained by the same adverse reaction hypothesis that was suggested in the previous section on the Spanish sample.

In Italy as well, exposure to church services at the age of twelve does not have a significant effect on fertility. However, unlike the Spanish experience, the father's intensity of religious activity does not affect the daughters' fertility in Italy. In Spain, the effect was significantly positive.

*Current religiosity variables*: In Italy too, current religiosity seems to have no effect on fertility. Equation #1 indicates that women who go to church intensively have 0.34 children *less* (significant at a significance level of 6.7%). As noted in the introduction, the current religiosity variables could be problematic, and they are therefore excluded from Equation #3.

*Socio-economic and demographic background variables*: Schooling has a negative effect on birth rates of Italian women. Each additional year of schooling leads to a decrease of 0.08 in birth rates. This implies, for example, that a woman with a college degree will have on average 0.6 children less than her counterpart who has completed elementary school only. The negative effect of schooling is in line with economic theory that relates the number of children to the cost of time that is higher for more educated women. The effect of schooling was not significant in the Spanish sample. A potential reason for the difference is a positive income effect (more educated women have also higher personal incomes and can support more children) that probably nets out the negative cost of time (substitution) effect in Spain. Women who are older than 30 years have about 0.8 children more than women who are at the youngest age group (30 years or less). Obviously, age is positively correlated with the number of children. Older couples are also married for more years and could have more children. The difference between the coefficients of the two age groups is not significant, implying that the effect is not monotonic.

Population size in place of residence and type of residence do not have a statistically significant effect on fertility. Italian women residing in the north-eastern and north-western regions of Italy tend to have less children than women in central and southern regions of the country (not reported in the Table; only marginally significant). The regional differences could stem from regional differences in the cultural and religious environments, employment opportunities and institutions.

To conclude, fertility equations estimated using Spanish and Italian samples differ somewhat. However, the core *unexpected* findings of the negative effect of maternal religiosity and the insignificant effects of current measures of religious practice, are similar in the two cases.[26]

## 4 Summary and discussion

The data set employed in this study has a rich array of religiosity variables: maternal and paternal church attendance (when the individual was a child); own church attendance at the age of twelve; current mass attendance; and current prayer habits. Each variable has a sequence of alternatives ranging from 'never' to very frequent religious activity, facilitating a careful analysis of the possible effects of various religiosity determinants on fertility.

The core findings are that exposure to religious conduct and norms during the formative years of childhood, in particular the religious practice of the mother, has a pronounced effect on women's 'taste for children'[27] that later on translates into birth-rates. In Spain, the two parents have major effects on women: while an intensively practicing father encourages the daughter to have more children, an intensively practicing mother has a negative effect on the daughter's birth rate, leading to lower fertility. The parental coefficients are not significantly different but the net effect seems to be negative, mainly due to gender differences in parental religiosity, whereby mothers are more religious than fathers. In Italy, only the mother has a negative effect, i.e., Italian women who were raised by a religious mother[28] will have less children than their counterparts who had a rarely practicing mother. The father's religious practice has no effect. Current religiosity seems to be irrelevant in the two countries. These two findings, the negative effect that a highly religious mother has on her daughter's birth rate, and the irrelevance of current religiosity (expressed by both the social/public activity of mass participation and the private/intimate activity of prayer) are somewhat unexpected and novel.

[26] Instead of running two separate regressions for Spain and Italy, one pooled regression of the two samples can be used. To allow different coefficients in the two countries the pooled regression should include, in addition to the set of explanatory variables, also a dummy variable for Italy and interactions of all variables with the dummy variable for Italy. From the results of this interactive pooled regression we can then derive the two separate equations (presented in Tables 2, 4). The coefficients of a pooled regression that does *not* include the interactive variables are estimates of weighted mean effects for the combined sample. Estimation of this restricted fertility equation reassures the significance of the negative coefficient of a highly religious mother ($Z = 2.11$) and the insignificance of the current religiosity measures.

[27] Guiso, Sapienza, & Zingales, 2003 use a similar argument to explain the effect of religiosity (of countries) on economic performance.

[28] There is a correlation coefficient of 0.6311 between maternal and paternal church attendance. A religious mother therefore implies (in most cases) a religious household.

The reported results should be treated with some caution due to the small sample sizes. However, as the samples seem to be representative samples of the populations, there is ground to believe that the basic results will also hold for larger samples. Small sample size could result in insignificance of explanatory variables, but in our reported fertility equations the coefficients of parental variables are highly significant. Moreover, the statistical significance of parental religious intensity coefficients is very robust. Experimenting with two regression models (OLS and Poisson); different specifications of the control variables (e.g. replacing age dummies with cohort dummy variables); and slight extensions of the sample (e.g. adding also widowed/divorced/separated women or extending the upper age limit) did not change the statistical significance of the religiosity core variables.

Our findings suggest that religiosity and fertility are interrelated but the mechanism is probably different from the simplistic causality that is suggested in the literature: the link between religiosity and fertility operates with a lag of one generation. Current fertility of Spanish and Italian women is driven primarily by their mothers' religiosity and a negative reaction leads to lower fertility among the daughters of the religious mothers. The religiosity of the mothers is probably one of the factors[29] that are responsible for the drop in birth rates. It is therefore not secularization that led to lower birth rates, as it appears that current religiosity is irrelevant. Moreover, we can speculate that if the mechanism of causality will not change, then secularization of this generation could lead to *higher* fertility in the next generation.

Does this inter-generational impact of religiosity on fertility apply to Catholics only? To answer this question we plan to extend our investigation and to do parallel studies for other countries with diverse religious denominations, such as Protestant, Moslem, Jewish, Buddhist and Hindu.

Our findings, combined with parallel future findings for other countries and religions, might lead to a revision of the literature that assumes a positive relationship between fertility and current religiosity on the one hand, and ignores the impact of childhood religiosity variables on the other hand.

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## 5 Appendix: Spanish sample characteristics

Appendix Table 1 presents the socio-economic characteristics of the respondents in the Spanish and Italian samples that are composed of married young women.

[29] Obviously there are many other factors that affect changes in birth rates, such as: macroeconomic variables, related transfer payments, education.

Appendix Table 1 Socio-economic characteristics, Young Spanish and Italian Women, 1998

| Variables | Spanish sample | Italian sample |
|---|---|---|
| Number of children | 1.89 (1.38) | 1.71 (1.07) |
| *Socio-economic and demographic variables*: | | |
| Years of schooling | 11.2 (4.1) | 11.5 (3.7) |
| Age (years) | 35.1 (6.0) | 35.3 (6.1) |
| Age groups (years) (%): | | |
| 18 to 30 | 27.0 | 21.1 |
| 31 to 40 | 52.2 | 54.5 |
| 41 to 45 | 20.8 | 24.4 |
| Population at place of residence | | |
| 10,000 or less (%) | 28.5 | 34.1 |
| Type of residence (%): | | |
| Urban | – | 42.3 |
| Metropolitan | – | 23.6 |
| Rural | – | 34.1 |
| *Region* (*Spain*) (%): | | |
| Andalucía | 21.7 | – |
| Aragón | 4.3 | – |
| Asturias | 3.4 | – |
| Baleares | 1.9 | – |
| Canarias | 3.9 | – |
| Cantabria | 1.0 | – |
| Castilla la Mancha | 3.4 | – |
| Castilla León | 8.2 | – |
| Cataluña | 15.5 | – |
| Valencia | 10.6 | – |
| Extremadura | 2.9 | – |
| Galicia | 4.8 | – |
| Madrid | 8.2 | – |
| Murcia | 3.9 | – |
| Navarra | 1.9 | – |
| País Vasco | 3.4 | – |
| La Rioja | 1.0 | – |
| *Region* (*Italy*) (%) | | |
| North-west | – | 27.6 |
| North-east | – | 20.3 |
| Central | – | 14.4 |
| South and islands | – | 37.4 |
| Sample size | 207 | 123 |

*Notes*: The sample includes Catholic young women (age $\leq$ 45) who were raised in Catholic households and are married to a Catholic spouse

Sample figures relate to the samples used for regression analysis

Standard deviations in parentheses

The socio-economic background is very similar in the two countries.

The age distributions are similar. The age range is 22-45 in Spain and 20-45 in Italy. The average age is 35 in the two countries. About half of the women in Spain and Italy are in the age group of 31-to-40.

The average number of years of schooling is 11.2 in Spain and 11.5 in Italy.

Around 30% of respondents in the two samples live in small places that are populated by 10,000 inhabitants or less. In Italy, all these places are rural.

The regional distributions reflect the national distribution. In Spain, the largest shares live in Andalucia, Cataluña, Valencia, Madrid and Castilla Leon. The shares of Cantabria, La Rioja, Navarra and Baleares are the smallest. In Italy, over one third of the sample resides in the southern parts of the country, about half live in the northern parts and the rest 14% live in the center.

Appendix Table 2 presents the distributions of the number of children.

Appendix Table 2 Distribution of Number of Children, Young Spanish and Italian Women, 1998

| Number of children | Spanish sample Frequency | % | Italian sample Frequency | % |
|---|---|---|---|---|
| 0 | 32 | 15.5 | 16 | 13.1 |
| 1 | 53 | 25.6 | 33 | 26.8 |
| 2 | 64 | 30.9 | 54 | 43.9 |
| 3 | 37 | 17.9 | 14 | 11.4 |
| 4 | 10 | 4.8 | 3 | 2.4 |
| 5 | 7 | 3.4 | 3 | 2.4 |
| 6 | 3 | 1.4 | – | – |
| 7 | 1 | 0.5 | – | – |
| Sample size | 207 | | 123 | |
| Statistics | | | | |
| Mean | 1.89 (1.38) | | 1.71 (1.71) | |
| Mode | 2 | | 2 | |

*Notes*: The samples include young (age $\leq 45$) Catholic women who were raised in Catholic households and are married to a Catholic spouse

The figures relate to the samples used for regression analysis

Standard deviations in parentheses

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