

IZA DP No. 2183

## Intergenerational Transmission of 'Religious Capital': Evidence from Spain

Pablo Brañas-Garza  
Shoshana Neuman

June 2006

# Intergenerational Transmission of 'Religious Capital': Evidence from Spain

**Pablo Brañas-Garza**

*Universidad de Granada*

**Shoshana Neuman**

*Bar-Ilan University, CEPR  
and IZA Bonn*

Discussion Paper No. 2183

June 2006

IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

Email: [iza@iza.org](mailto:iza@iza.org)

Any opinions expressed here are those of the author(s) and not those of the institute. Research disseminated by IZA may include views on policy, but the institute itself takes no institutional policy positions.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit company supported by Deutsche Post World Net. The center is associated with the University of Bonn and offers a stimulating research environment through its research networks, research support, and visitors and doctoral programs. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

## ABSTRACT

### Intergenerational Transmission of 'Religious Capital': Evidence from Spain<sup>\*</sup>

The paper examines intergenerational transmission of 'religious capital' from parents to their offspring, within an economic framework of a production function of 'religiosity' where parental inputs serve as factors of production. A sample of Catholic Spaniards who grew up in Catholic households is used for the empirical study. A rich unique data base is employed with data on several aspects of religiosity: two dimensions of the individual's religiosity – mass attendance (6 levels) and prayer (11 levels); information on the mother's and father's church attendance when the respondent was a child (9 levels) as well as the respondent's mass participation at the age of 12. The use of detailed religiosity measures (rather than one dichotomous variable, e.g. goes to church-yes/no; practicing Catholic – yes/no), facilitates a more sophisticated analysis with robust conclusions. A theoretical framework is followed by stylized facts on household composition. Then the effect of the parents' input on respondent's religiosity is examined – first using cross-tabulation and then using Ordered Logit regression. The inputs of the parents are proxied by the mother's and father's intensity of church attendance when the respondent was a child. The output (respondent's religiosity) is measured using detailed data on mass attendance and prayer. Exposure to mass services during childhood and socio-economic variables are also considered. All in all we find that parental religious inputs significantly affect individuals' religiosity BUT the route of intergenerational transmission is from mother to daughter and from father to son. Women are not affected by paternal religiosity and men are unaffected by maternal religiosity. Current religiosity is also affected by own exposure to mass services during childhood – own experience has a more pronounced effect on the private/intimate activity of prayer than on the social/public activity of church attendance. Current mass participation is more affected by parental than by own mass attendance during childhood.

JEL Classification: Z12, J12, J13, D13

Keywords: religious capital, Catholic, church attendance, prayer, intergenerational transmission, production, Spain

Corresponding author:

Shoshana Neuman  
Department of Economics  
Bar-Ilan University  
52900 Ramat-Gan  
Israel  
E-mail: [neumans@mail.biu.ac.il](mailto:neumans@mail.biu.ac.il)

---

<sup>\*</sup> We acknowledge comments from Alicia Adserá, Vicky Ateca, Ramón Cobo, Juanjo Dolado, Natalia Jiménez, Larry Iannaccone, Evelyn Lehrer, Ana I. Moro, David Voas and participants of ESRC seminar on Religion at Oxford (May 2005), ISSSR meeting at Rochester (Nov. 2005) and seminars at Carlos III and Granada University. Pablo Brañas acknowledges financial support from Fundación Ramón Areces (2005) and from DGICYT (SEJ2004-07554/ECON).

## 1. Motivation

This paper explores intergenerational transmission of 'religious capital' for a representative sample of Spanish Catholics. It extends a previous paper by the authors (Brañas-Garza and Neuman, 2004) that used the same sample to analyze religiosity patterns (expressed by church attendance and prayer) of Spaniards, within an economic framework<sup>3</sup>.

The basic idea of this study is that the accumulation of an individual's 'religious capital' starts at childhood when he is watching his parents' religious activities and he is exposed to religious practice, such as mass attendance. The mother and father are passing on religious knowledge and attitudes to their children (Hoge et al., 1982; Clark and Worthington, 1987; Ozorak, 1989; Thomson et al., 1992; Hayes and Pittelkow, 1993). The parents' religious behaviours are factors of production in the process of building the child's 'religious capital'. The more intensive is the parents' practice, the more religious the person will be when he grows up. This investment of the parents in their offspring's religious capital forms the solid basic basis that might be subsequently extended by a spouse when the person gets married to a practicing spouse<sup>4</sup>.

For the empirical analysis we are using a unique rich database that was collected in 1998 by the Centro de Investigaciones Sociológicas (Center for Sociological Research, Spain), under the International Social Survey Program: Religion II, supported by UNESCO. It is based on 2488 personal interviews that were carried out in all 47 Spanish provinces. It includes information on respondents' religious denomination; his religious activity as evidenced by two dimensions of religiosity: mass attendance (a public religious activity with utilitarian/social motives-has six alternative levels) and prayer (an intimate/private religious activity with pure

---

<sup>3</sup> Following the pioneering model of religiosity of Azzi and Ehrenberg (1975) and numerous subsequent papers such as: Long and Settle, 1977; Ulbrich and Wallace, 1983; Neuman 1986; Iannaccone, 1990. A comprehensive review of the literature is presented in Iannaccone, 1998.

<sup>4</sup> See Grossbard-Shechtman and Neuman (1986) who reported on the effect of marriage and of wife's religiosity on the husband's religious activity, for a sample of Israeli Jewish men. See also Schoen and Weinick (1993).

religious motives-11 levels); religious denomination and church attendance of the mother and father when the respondent was a child (9 alternative levels); church attendance of the individual when he was 12 years old (9 levels); and a battery of personal socio-economic background questions (e.g. age, education, marital-status, number of children, personal income, household income) <sup>5</sup>. While most empirical studies are employing one dichotomous variable to measure religiosity (e.g. goes to church-yes/no; practicing Catholic- yes/no), our data base provides much more details on religious activities of respondents and their parents, thus facilitating a more sophisticated analysis with more robust conclusions. The relationship between the respondents' religiosity and the parental religious inputs is examined using two types of statistical analysis: One is a descriptive table that relates parental inputs to children's religiosity (measured by the mean, median and mode of religiosity levels). The second type uses Ordered Logit regression analysis to present 'religiosity equations'. The estimated equations include in addition to the variables that are the focus of our study (parental religious inputs) also other socio-economic variables that affect religiosity, in order to control for their effects and to arrive at net effects of parental variables. The analysis is done for each of the genders separately (allowing gender differences).

We restrict our study of intergenerational transmission of 'religious capital' to Catholic respondents who grew up in household of Catholic parents, in order to form a homogenous sample where all players belong to the same religion and are subject to the same rules of religious conduct.

The paper is structured as follows: The next section presents background information on the composition of our sample in terms of religious denomination of the respondents and their parents (that reflects the religious composition of the Spanish population). In the third section a formal framework of production of religiosity is suggested and testable hypotheses are presented. The theoretical framework is followed by an empirical analysis of the effect of parents' religiosity (proxied by their church attendance) on the respondents' religiosity (measured by

---

<sup>5</sup> This unique rich data set was also used by Brañas-Garza (2004) to study secularization in Spain and by Iannaccone (2003) as part of an international comparative study.

church attendance and by prayer). The results facilitate the testing of our hypotheses. The last section summarizes and concludes.

## **2. Religious Denomination of Respondents and Parents**

Our empirical study of the transmission of 'religious capital' from parents to children is restricted to Catholic households where the respondents and the two parents have the same Catholic denomination. This forms a more homogenous sample and avoids potential measurement and estimation problems that arise from different religious conduct in the various religious denominations.

Eighty three percent of the respondents in our sample<sup>6</sup> define themselves as Catholic. One percent belongs to other religions and the rest 16% declare that they have no religion. This distribution reflects the share of Catholics in the Spanish population. According to data from the Spanish Bureau of Statistics, close to 90% of the population are Catholic, about 1.5% has other religious affiliations and around 8.5% claim to have no religion. These figures have been fairly stable since 1990 (Brañas-Garza and Neuman, 2004)

An examination of the parents' religious affiliation of Catholic individuals is presented in Table 1<sup>7</sup>.

---

<sup>6</sup> A total of 2057 out of 2463 subjects who answered this question. Twenty five individuals did not answer this question.

<sup>7</sup> The data are derived from Question #50: "Are you Catholic? " ; Question #24: "When you were a child, did your mother define herself as Catholic? " ; and Question #25: "When you were a child did your father define himself as Catholic? " .

**Table 1**  
**Parents' Religious Denomination**  
**Catholic Spaniards, 1998**

		Father		
		Catholic	non-Catholic	Total
Mother	Catholic	1916 (93.1 %)	106 (5.2 %)	2022 (98.3 %)
	non-Catholic	14 (0.7 %)	21 (1.0 %)	35 (1.7 %)
	Total	1930 (93.8%)	127 (6.2%)	<i>n=2057</i>

**Notes:** - 'non-Catholics' include: other religions; no religion; atheists; did not have a mother/father at the age of 12; does not know; did not answer

As is evident from Table 1, the great majority (91.3%) of Catholic respondents grew up in households where both the father and the mother were Catholic. In 1.0% of the household the two parents were non-Catholic and in 5.9% of the cases there was inter-marriage of a Catholic person with a non-Catholic spouse. In most of these 120 cases the non-Catholic spouse was the father. It is interesting that 120 individuals who lived in households with inter-marriage 'converted' to Catholicism. On the other hand, our sample includes 270 individuals who were raised in homogenous Catholic families and they do not define themselves as Catholic anymore<sup>8</sup>. Our analysis will be restricted to the 1916 households where both parents are catholic (and so is the respondent).

### **3. Production of Religiosity: Formal Framework and Measurement**

#### **3.1 Framework**

Men and women devote time inputs to time intensive religious activities (such as church attendance) as an investment in their own religiosity and also in order to expose their kids to religious practice and hence invest in the children's 'religious

---

<sup>8</sup> Twelve switched to other religions; 175 do not believe in any religion; 49 are atheists and 34 did not answer the question on their religious affiliation. 'Converting out' of the Catholic faith is therefore more pronounced than 'converting in'. See also Table 5.

capital' and transmit religious attitudes and values to the next generation.<sup>9</sup> This accumulation of 'religious capital' during childhood will result in a more religious adult (as reflected in devoting more time to activities such as mass attendance and prayer). It has been extensively documented that religious (and ethnic) traits are usually adopted in early formative years of childhood and that family and other role models play a crucial role in this socialization process (Cavalli-Sforza and Feldman, 1973, 1981; Clark and Worthington, 1987; Cornwall, 1988; Ozorak, 1989; Thomson et al., 1992; Hayes and Pittelkow, 1993; Bisin and Verdier, 2000, 2001). Gender differences in the socialization process have also been recognized (e.g., Beit-Hallahmi, 1997; Brañas-Garza and Neuman, 2004).

Formally, let's denote by  $R_i$  the respondent's current religiosity level and by  $F(.)$  the production function of the individual's religiosity. The factors of production are: Input of time devoted by the mother to religious activity when the respondent was a child ( $Im_i$ ) and time devoted by the father to religious practice when the individual was a child ( $Id_i$ ). Obviously there are more factors of production in the process of producing the individual's religiosity, such as: The educational system, the social impact of the community and of friends, religiosity level of the spouse (for married individuals)<sup>10</sup>. As we focus on parental intergenerational transmission of 'religious capital' and due to data limitations we will concentrate on  $Im_i$  and  $Id_i$ . A distinction will be made between the two genders.

$$R_i = F(Im_i, Id_i) \quad (1)$$

Based on economic and sociological literature on intergenerational transmission of cultural values and on gender roles and gender differences (cited above), the following testable hypotheses can be stated:

- (a) Positive marginal products of the inputs of the mother and the father i.e., the derivatives of both  $Im_i$  and  $Id_i$  are positive ( $\partial R_i / \partial Im_i > 0$  and

---

<sup>9</sup> Even when this is not done with the specific intention of affecting the kid's religiosity, this is most probably the outcome - children that are exposed to religious practice of their parents, accumulate religious specific human capital. This accumulation is intensified if the child actively participates in religious practice (goes to church with parents).

<sup>10</sup> See, Johnson (1980); Grossbard-Shechtman and Neuman (1986); Erickson (1992); and Bisin and Verdier (2000).



$\partial R_i / \partial Id_i > 0$ ): religious attitudes and practise are transmitted from parents to children, we therefore expect a significant positive effect of the mother's and the father's religious practice ( $Im_i$  and  $Id_i$ , respectively) on the respondent's religious practice ( $R_i$ ).

(b) The effect of  $Im_i$  will be stronger in the case of female respondents (i.e.  $\partial R_i / \partial Im_i > \partial R_i / \partial Id_i$ ) while the opposite will be true in the case of males ( $\partial R_i / \partial Im_i < \partial R_i / \partial Id_i$ ): Because mothers serve as role models for their daughters, while boys look up to their fathers as their role models.

(c) The effect of parents' church attendance on the offspring's church attendance is more pronounced and more significant than its parallel effect on prayer (both  $\partial R_i / \partial Im_i$  and  $\partial R_i / \partial Id_i$  are expected to be larger and more significant in the 'mass participation equation' than in the 'prayer equation'): Similar religious activities are supposed to be more closely related, mainly because children tend to simulate the parents' behaviour.

(d) Larger positive effects in the sample of female respondents compared to the sample of males: A production function of type (1) exists for both men and women; however the coefficients, that express the transformation of parental inputs into religiosity of the offspring, might differ for the two genders. As women are more spiritual, we expect to find larger coefficients of parental inputs in women's 'religiosity equations'.

(e) Stronger (relatively) effects of parents' ( $Im_i, Id_i$ ) when  $Im_i = Id_i$ : It is documented in the literature that homogamous families in which parents share the same religion enjoy a more efficient socialization technology than families composed of parents with mixed religions, and that children of mixed religious marriages are less likely to conform to any parental religious ideology or practice like church attendance (Heaton, 1986; Hoge et al., 1982; Ozorak, 1989). Most of these studies relate to ethnic minorities and look at the religious affiliation only and not at the intensity of religious practice (within the same religion). Obviously, we have a different setting: We are examining the effect of parents who share the same Catholic

denomination and we focus on homogamy in the sense of the same intensity of religious practice. Also, our sample consists of Spanish natives and not of respondents who belong to minority groups. However, a similar rationale might lead to the hypothesis stated above, that parents who are more homogenous in terms of religiosity level ( $Im_i=Id_i$ ) will be more efficient in the transmission of religious traits. We have no a priori assumptions on the second derivatives or on the cross derivatives of the two factors of productions. While in a standard production function maximization of profit implies decreasing marginal products of factors of production, in the case of production of religiosity we might observe increasing marginal products ( $f'>0$ ). The cross derivatives might be either negative (indicating substitution between factors of production,  $\partial Im_i / \partial Id_i < 0$ ) or positive (indicating complementarity,  $\partial Im_i / \partial Id_i > 0$ ). There is also the option of indifference between the two factors of production ( $\partial Im_i / \partial Id_i = 0$  when factors do not affect each others).

(f) Erosion of the effect of exposure to parental religious practice, as time passes by and the respondent gets older: Behavioral economists (e.g. Kahneman et al., 1997) claim that experience affects preferences but the effect of experience erodes with time. If this is true also for religious experience and for preferences for religiosity, then we expect to observe stronger effects of parental inputs on young respondents. The effects will become weaker at advanced ages<sup>11</sup>.

(g) A negative relationship between the probability to 'convert out' of the Catholic faith and  $(Im_i, Id_i)$ : Our statistical analysis is restricted to the sample of Catholic respondents (i.e.  $R > 0$ ), with two Catholic parents ( $Im_i > 0, Id_i > 0$ ). This restriction was imposed in order to have a homogenous sample in terms of religious rules of conduct. However, it is possible to extend the

---

<sup>11</sup> An alternative explanation for an expected negative relationship between age and parental effect (everything else being equal) could be the following: a child tends to simulate and mimic his parents' behavior (e.g. mass attendance), as he grows up he updates his preferences/taste that might than deviate from those of his parents'.

sample and include also non-Catholic respondents who grew up in Catholic families, in order to test the hypothesis that the tendency to leave the Catholic faith ( $R=0$ ) is also related to parental inputs and is higher if parental religious inputs were lower.

### 3.2 Measurement of input and output variables

The independent input variables  $lm_i$  and  $ld_i$  are proxied using data that relates to mass participation of the mother and father when the respondent was 12 years old. For each of these variables there is data on a scale of 1 to 9 (1- never attended church services to: 9- attended several times a week)<sup>12</sup>.

The responses to the questions that relate to childhood are retrospective and might be inaccurate; we therefore created a variable with three broader categories by combining responses that are close (see Iannaccone, 2003, for justification).

The 9 original options are reduced to the 3 following categories:

(1)  $lm_i/ld_i = 1$ : 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 low-practicing Catholic mothers/fathers.

(2)  $lm_i/ld_i = 2$ : 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.

(3)  $lm_i/ld_i = 3$ : 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.

$lm_i$  and  $ld_i$  therefore belong to  $L$  where  $L=(1,2,3)$ .  $l=1$ , is for the case where the mother (father) rarely attended church services;  $l=2$  if the mother (father) eventually attended; and  $l=3$  if they regularly attended. The pairs  $(lm_i, ld_i) \in R^2_{++}$  represent (*mother, father*) combinations of intensity of mass participation during respondent's

---

<sup>12</sup> Based on questions #28, for the mother and question #29, for the father: "When you were a child, did your mother (father) 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).

childhood. For example  $(3, 1)$  represents a household where the mother regularly attended mass services and the father rarely attended.

The dependent variable ( $R$ ) - level of religiosity of the respondent - is estimated using two dimensions of religiosity, mass participation and prayer habits. *Mass* participation is measured on a scale from 1 to 6 (1- never participates; to 6- participates every week)<sup>13</sup>. *Prayer* is measured on a scale from 1 to 11 (1- never prays; to 11- prays several times every day)<sup>14</sup>. These two aspects of religiosity have different motives: while church attendance is a public activity that also has utilitarian/social/network motives, prayer is a private/intimate activity with a pure religious salvation motive. The costs of the two activities are also different: church attendance is more time consuming and therefore has higher alternative costs.

The values of  $R$  (either mass participation or prayer) refer to current practice and should not have any measurement errors. The full spectrum of values will be used for regression analysis and for the computation of central values.

### **3.3 Descriptive statistics of input ( $Im_i, Id_i$ ) and output ( $R$ ) variables**

Before we turn to the statistical analysis of the relationship between parents' inputs and the offspring's religiosity, it might be useful to have some descriptive statistics on the respondents' and parents' religious activities.

Table 2 presents a cross tabulation of the mother's and father's mass participation levels ( $Im_i, Id_i$ ), where  $Im_i, Id_i \in L = (1, 2, 3)$ .

Table 2 indicates that the modal combination is  $(Im_i, Id_i) = (3, 3)$ . In more than 41% of households of origin, both the mother and the father intensively practiced religious activities.

---

<sup>13</sup> Based on question #50b: "How often do you attend mass services at the church?" . Has 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). Notice that the same question that relates to the mother/father has a somewhat more detailed characterization composed of 9 categories.

<sup>14</sup> Based on question #31: "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).

The other two figures on the diagonal that represent homogenous households, are significantly lower: In 11% of households both parents were rarely practicing mass,  $(l_{m_i}, l_{d_i}) = (1, 1)$  and in about 15% of families the parents attended mass occasionally,  $(l_{m_i}, l_{d_i}) = (2, 2)$ .

**Table 2**  
**Cross-Tabulation of Mother's and Father's Religiosity Level**  
**Catholic Spaniards, 1998**

		Father			Total
		$l_{d=1}$	$l_{d=2}$	$l_{d=3}$	
Mother	$l_{m=1}$	11.2%	0.5%	0.3%	11.9%
	$l_{m=2}$	8.1%	15.1%	1.6%	24.8%
	$l_{m=3}$	8.2%	13.7%	<b>41.4%</b>	63.3%
	Total	27.6%	29.2%	43.2%	1735

**Notes:** - Sample of Catholics with Catholic parents  
-  $l_{m_i}/l_{d_i}=1$  for a Catholic low-practicing mother/father;  $l_{m_i}/l_{d_i}=2$  for a Catholic medium-level practicing mother/father; and  $l_{m_i}/l_{d_i}=3$  for a Catholic intensively practicing mother/father (see page 8 for definition)

The figures above the diagonal represent a more active father ( $l_{m_i} < l_{d_i}$ ). Interestingly, there is a negligible number of families of this type (40 out of 1735) that constitute a mere of 2.4%. In about 30% of the households the mother was more active (figures below the diagonal, where  $l_{m_i} > l_{d_i}$ ). We can therefore summarize that most households in the sample are homogenous in terms of parents' level of religious practice and the great majority are intensive practitioners. In non-homogenous families, it appears that the mother is the more religiously active person. This is also reflected in the figure that about two thirds of mothers compared to about 40% of fathers have the largest level,  $l=3$ . On the other hand, the percentage of non-religious individuals ( $l=1$ ) is more than double for men compared to women (28% and 12%, respectively). These gender differences in religiosity are documented in multiple studies (e.g. Beit-Hallahmi, 1997; Brañas-Garza and Neuman, 2004; Brañas-Garza, 2004).

Table 3 relates to the respondents' (kids') current religious activities. Unlike most empirical studies on religiosity that use only church attendance as an indicator of religiosity, we have information on two types of activities: church attendance and prayer. The first is a public activity, for which social and utilitarian motives are relevant, while the second is conducted privately at home and reflects Azzi Ehrenberg's salvation motive<sup>15</sup>.

**insert Table 3 about here**

Table 3 presents the distribution and the mean, mode and median of the two output religiosity variables. The figures are presented for women and men separately, in order to check for gender differences.

In our representative sample of Catholic Spaniards, about one quarter is practicing intensively: Twenty seven percent attend church services every week and 26% pray at least one time every day. At the other end, close to 20% never went to church and never prayed. The mean and median are close to the middle point of the distribution (mean=3.56 and median=3 for Mass Attendance; mean=6.05 and median=6 for Prayer). Interestingly, the mode belongs to the extreme maximum values (mode=6 for Mass Attendance and mode=10 for Prayer). However, the distribution is multi modal and there are other values with large frequencies.

It appears (from a comparison of Table 2 and Table 3) that the respondents are less religious than their parents, indicating secularization of the Spanish population<sup>16</sup>.

A comparison of the two genders reassures that women are more religious than men: Thirty two percent of women compared to 20% of men go to church every week and only 14% of women compared to 24% of men never go to church. The differences are even more pronounced at the prayer activity: The share of women

---

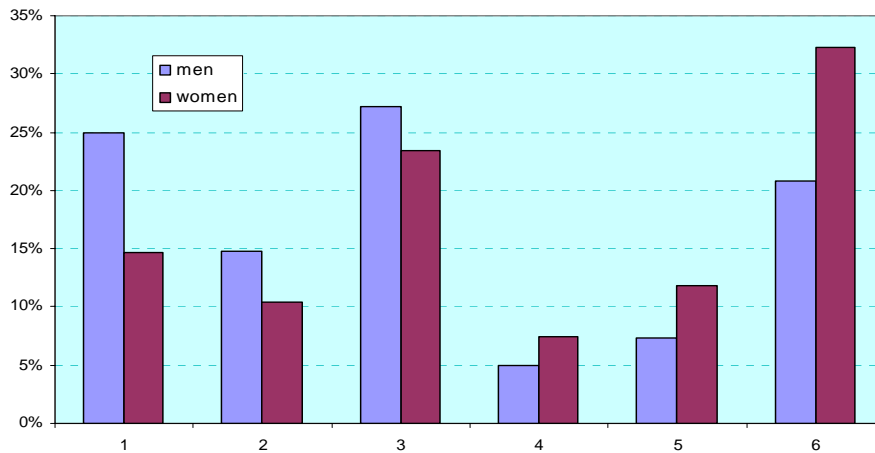
<sup>15</sup> See Brañas-Garza and Neuman (2004) for a fuller discussion.

<sup>16</sup> However, this conclusion should be treated with some caution because the measurement scales are different and the responses that relate to parents are retrospective.

who pray at least once a day is almost three times larger compared to the respective share of men (35% and 14%, respectively). At the other extreme, only 11% of women and 25% of men never pray. These gender differences are also reflected in the mean, median and mode of the distributions (the respective means are 6.98 and 4.90; the median is 8 for women and 4 for men; the respective modes are 10 and 1). These major gender differences in prayer habits reflect gender differences in religious and spiritual attitudes and values. The narrowing of gender differences in attending mass services might be explained by the different nature of this religious practice: it has utilitarian motives as well. The church serves as a network and as a social club. Men who value networking more than women, attend services in order to create and maintain social and business ties.

In order to get a more visual presentation of the distributions, Figures 1 and 2 display frequency distribution histograms for Mass Attendance (Figure 1) and for Prayer (Figure 2) for the two genders.

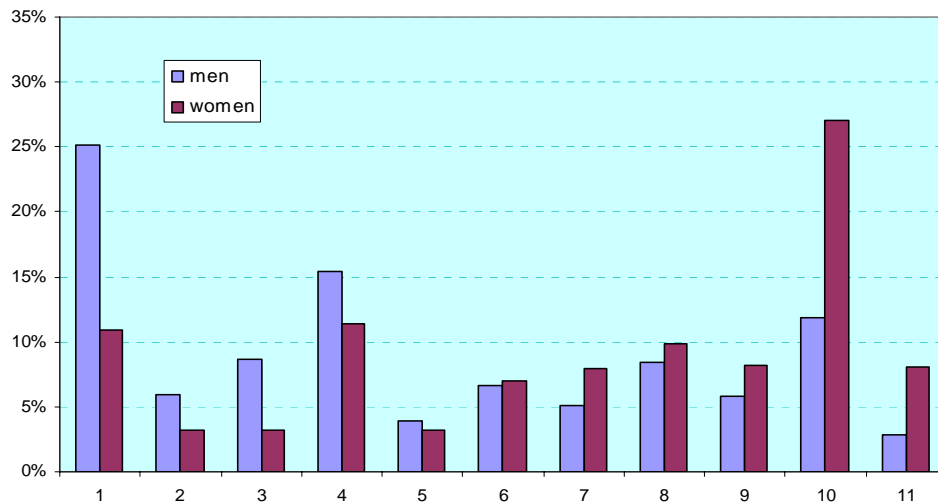
**Figure 1**  
**Distribution of Relative Frequencies of Mass Attendance Levels**  
**Spanish Women and Men, 1998**



**Notes:** - The samples include Catholic respondents who grew up in Catholic families.  
- Samples include 1036 women and 819 men.

The diagrams add a visual reassurance that women are more religious than men, in particular in terms of prayer that has a more private/intimate nature and is the better reflection of 'pure' religiosity.

**Figure 2**  
**Distribution of Relative Frequencies of Prayer Habits**  
**Spanish Women and Men, 1998**



**Notes:** - The samples include Catholic respondents who grew up in Catholic families.  
 - Sample include 1036 women and 819 men.

#### 4. Intergenerational Transmission of 'Religious Capital'

We are now acquainted with the religious performance of the respondents and their parents and are ready to examine the interrelationship between the two generations and test our hypotheses (Section 3.1, page 7)

First, a descriptive statistical analysis will be presented and then regression analysis will be employed in order to arrive at more compact results and to control for socio-economic background variables that might also affect respondents' religious behaviour and should therefore be considered. The dependent variable is categorical and therefore Ordered Logit will be used for estimation. The regression



coefficients reflect marginal productivity of inputs and can be used to test our hypotheses.

#### **4.1 Descriptive analysis of parental effect on mass attendance and prayer**

Table 4 presents descriptive summary statistics that relates parental inputs (measured by levels of church attendance during respondent's childhood) to the individual's religious activity, measured by church attendance and by prayer. Due to the negligible sample sizes of households with a more religiously active father (see Table 2) we refer only to household where both parents have similar religiosity levels or where the mother is more active. Parental inputs are denoted by pairs of  $(l_m, l_d)$  and individuals' religiosity levels are measured using several central measures: the mean of the various categories (1-6 for church attendance and 1-11 for prayer), the modal category and the median. A distinction is made between the two genders.

**insert Table 4 about here**

As is evident from Table 4 there is a pronounced positive relationship between parental religious inputs  $(l_m, l_d)$  and individuals' religiosity levels. The individual's intensity of church attendance and of prayer is clearly increasing with parental inputs (in terms of their church attendance during the individual's childhood). Interestingly, in households where the two parents rarely practiced, ie  $(l_m, l_d) = (1, 1)$ , the modal value for the kids (both women and men) is also the lowest possible: (1)- never attends mass; and (1)- never prays. At the other extreme, when the two parents attended mass intensively  $(l_m, l_d) = (3, 3)$ , the kids follow and the modal value (for women and for men) is 6 for church attendance (every week) and 10 for prayer (every day).

Women seem to be affected mainly the mother and men's religious behaviour seems to be more closely related to the father's religious activity (for instance: moving from  $(3, 1)$  to  $(3, 2)$  or from  $(2, 1)$  to  $(2, 2)$  where only the father's mass

attendance increases, leads to a very small change in the mean of the women's mass attendance and a much larger change in the case of men's mass attendance. Women's prayer habits even show a small decrease).

Our statistical analysis of the relationship between parental religious inputs and respondents' religiosity is restricted to Catholic individuals with two Catholic parents. However it is interesting and informative to also examine the relationship between parental inputs and the absence of Catholic religious belief i.e., the probability to 'convert out'.

**Table 5**

**Respondents' Religious Affiliation and Parental Religious Inputs**

**Spanish Women and Men, 1998**

Respondent's affiliation	Parental inputs ( $Im_i, Id_i$ )					
	(1,1)		(2,2)		(3,3)	
	Women	Men	Women	Men	Women	Men
Catholic	137 (78.3)	80 (48.5)	140 (84.8)	124 (93.9)	397 (94.7)	323 (88.3)
Other religion	5 (2.9)	2 (1.2)	2 (1.2)	1 (0.8)	4 (1.0)	4 (1.1)
No religion	33 (18.9)	83 (50.3)	23 (13.9)	7 (5.3)	18 (4.3)	39 (10.7)
Total	175	165	165	132	419	366

**Notes:** - The sample includes all respondents with Catholic parents  
 - 'No religion' includes atheists. Missing values are excluded

As is obvious from Table 5, the probability to leave the Catholic faith is also related to parental inputs. A negligible number of individuals in our sample (18 out of a sample of 1422=1.3%) switched to other religions. A larger percentage (203 out of 1422=14%), claim to have 'no religion'. The share of men who have no religion is double compared to the share of women (19.4% and 9.7%, respectively), another indication that women tend to be more religious than men. The share of individuals who 'converted out' is clearly related to parental levels of religiosity. This negative relationship is more pronounced for men. The effect of ( $Im_i, Id_i$ ) on the probability to leave the Catholic faith is not linear and is gender specific.

If the two parents were rarely practicing – less than 80% of their daughters and less than half (48%) of their sons will stay Catholic. About 20% of daughters and over half(!) of sons will have no religion. In the case that the two parents were practicing occasionally - the percentages with 'no religion' drop to 14% for women and 5% (down from 50.3%!) for men. They further drop to 4% for women and, surprisingly, rise to 11% for men who grew up in households where the two parents were practicing intensively.

Parental religious inputs are therefore responsible for the tendency to stay Catholic and furthermore, to the level of religiosity of those who are Catholic.

This descriptive presentation in Table 4 on the relationship between parental input and Catholic respondents' religiosity suffers from two methodological limitations: first, the results are somewhat diffuse and one has to consider the whole array of numbers in order to draw conclusions. Second, it does not control for other variables that might be responsible for the respondent's level of religiosity (e.g., education, age, marital status, number of children). Regression analysis solves these two problems.

#### **4.2 Ordered Logit regression analysis**

Table 6 presents 'religiosity equations' estimated using Ordered Logit regression analysis. The dependent variable ( $R$ ) is the religiosity level of the respondent, proxied either by participation in mass services or by prayer habits (using all possible values of these two variables). The independent variables include: Our core independent variables that are the mother's and the father's religious inputs (using two dummy variables for each,  $Im_i/d_i=2$  or 3, with the minimal level of 1 as the reference group). Interaction terms of identical levels of church attendance of the two parents have also been introduced in order to test the assumption that the effects of the parents' inputs are not simply additive but are reinforced in homogenous families where  $(Im_i, Id_i)^{17}$ . Church attendance of the individual when

---

<sup>17</sup> But have been dropped due to insignificance of all interaction terms.

he was 12 years old is also included in order to net out the effects of parental inputs that are most probably correlated with this variable<sup>18</sup>.

Another set of independent variables is a series of socio-economic and geographical background variables: marital status; number of children; number of years of schooling; age group; population size in place of residence; type of place of residence (within the metropolitan area of a big city or not, typically for small cities around Madrid); region of residence (the so-called “Autonomías” in Spanish).

The two alternative dependent variables are categorical and ordered from low to high (Mass participation: ‘never participates’ to ‘every week’ - 6 categories; Prayer: ‘never prays’ to ‘several times a day’ – 11 categories). An Ordered Logit econometric model that estimates relationships between an ordinal dependent variable and a set of independent variables is therefore used for the estimation of ‘religiosity equations’<sup>19</sup>.

Table 6 presents the results of the Ordered Logit regressions, whereby an underlying score is estimated as a linear function of the independent variables and a set of *cut* points. The probability of observing outcome  $i$ , that correspond to the estimated linear function, plus a random error, is within the range of the cut points estimated for the outcome

$$\Pr(\text{outcome}_j = i) = \Pr(k_i - 1 < \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_k x_{kj} + u_j \leq k_i), \quad i = 1 \dots I \quad \text{where } u_j \text{ is}$$

assumed to be logistically distributed. In either case, the coefficients  $\beta_1, \beta_2, \dots, \beta_k$  along with the cut points  $k_1, k_2, \dots, k_{I-1}$ , are estimated, where  $I$  is the number of possible outcomes and  $k_0$  is taken as  $-\infty$  and  $k_I$  as  $+\infty$ .

---

<sup>18</sup> However, parents who attend mass are not necessarily accompanied by their child. In order to arrive at net effects of the parents explicit inputs, the child’s church activity should be included as an additional regressor; otherwise we will get biased estimates that include (implicitly) the contribution of the kid’s own activity. Indeed, when this variable has been excluded we got larger coefficients for parental inputs. However, the basic results have not changed.

<sup>19</sup> Two other options are: The two-outcome logistic model, with an arbitrary dichotomization and Ordinary Least Squares. The first model simplifies the results (compared to Ordered Logit) but uses less information and is therefore less suitable. The Ordinary Least Squares, which treats the ordinal variable as continuous, is an even less appealing alternative. The problem is that the gaps between successive values are not equal and, therefore, changing labelling (e.g., to 20 for ‘prays several times a day’) would yield different results.

The coefficients of the Ordered Logit estimation cannot readily be interpreted, but could be the estimated marginal effects of each variable on the unobserved latent variable from which the ordered outcomes are derived. However, such marginal effects include the normalizing to one of the error variance, which is not identified.

Regressions of each of the religious activities were estimated for men and women separately.

#### *4.2.1. Effects of parental religious inputs*

We now turn to the effects of parental religious inputs (proxied by their religiosity levels, in terms of mass participation, when the respondent was a child) on the respondents' religiosity that is reflected by their mass participation and by prayer activities. Regression results will also be referred to our hypotheses (a) to (f) (see page 7)

(a) and (b) Parents' religious inputs have positive monotonically increasing effects on the respondents' religiosity, BUT only the effects of the same gender parent are significant. The mother's input has a significant effect on mass participation and on prayer habits of our female respondents, while the effects of the father's input are insignificant. Our male respondents are affected only by their fathers' religious inputs, while mothers' religiosity levels have insignificant impacts. The impact of the parent's input on the (same gendered) offspring religiosity is not linear and in the prayer equation only the effect of an intensive input ( $I=3$ ) is significant while a medium-level input ( $I=2$ ) has an insignificant impact (at a 0.05 significance level)<sup>20</sup>.

**insert Table 6 about here**

---

<sup>20</sup> We also experimented with a continuous version of the parents' inputs (treating the parent's mass attendance as a continuous variable with 6 possible values). This version utilizes more information but has two problems: it assumes a linear relationship between the input and the output and it suffers from potential measurement errors, as the responses to the questions on parental mass attendance are retrospective and relate to past far experience. Nevertheless the basic results were similar.

(c) Parental mass participation has a more pronounced effect on the respondent's mass attendance than on his prayer habits, as evidenced by the larger and more significant coefficients in the 'mass participation religiosity equation'. Moreover, as mentioned above, the effects on payer are significant (at a 0.05 significance level) only if the (same gender) parent was practicing intensively ( $I=3$ ). This is true for the two genders. These results support our third hypothesis.

(d) Women tend to be more influenced by (same gender) parental inputs compared to men, as reflected by the larger coefficients of  $Im_i$  in the female equations compared to the coefficients of  $Id_i$  in the parallel male equations. This finding reflects women's stronger taste for religiosity and supports our fourth hypothesis

(e) We did not find magnified effects of homogenous parental inputs ( $Im_i=Id_i$ ): In order to test hypothesis (e) we added interaction terms of identical parental inputs. None of them was significant, which means that there is no additional interactive effect of homogenous inputs, beyond the effects of each of the inputs separately. Experimenting with other interactions of the inputs of the two parents, resulted in insignificant coefficients for all interaction terms, indicating that the effects of the two parents are independent. Neither substitution, nor complementarity of the parental inputs is evidenced. These results are in line with the findings reported under hypotheses (a) and (b) that only the parent of the same gender has a significant effect on the respondent's level of religiosity.

(f) The effect of childhood religious experience on individuals' preferences for religiosity does not erode with time: Interaction terms of parental inputs and the age group of the respondent<sup>21</sup> were all insignificant (and were therefore excluded from the regressions reported in Table 6), indicating that the time distance between the religious experience during childhood and the

---

<sup>21</sup> Separate dummy variables of age groups are also included, in addition to the interaction variables, in order to control for other pure effects of age, see below a discussion of effects of socio-economic variables.

current religious behaviour is irrelevant. In this sense, religious experience might be different from other experiences with a good/service/event. This indicates that the religious experience is more profound and deeply rooted in the individual and its effect prevails along the individual's life time.

(g) Parental religious inputs have a positive significant effect on the individual's tendency to stay Catholic, or alternatively: a negative effect on the probability to 'convert out'. In order to test hypothesis (g) we extended the sample to all respondents who grew up in Catholic households. Both the cross-tabulation descriptive statistics (Table 5) and a logistic regression (dependent variable is equal to 1 if stayed Catholic and 0 if not, results not reported)<sup>22</sup> show a clear positive relationship between parental levels of religiosity and the probability of the individual to remain Catholic. This is the case for both women and men. The effect is even more pronounced for men- boys who grew up in households where the two parents were rarely practicing, have a higher probability to leave the Catholic faith than to remain Catholic (probabilities of 51.5% and 48.5%, respectively).

#### *4.2.2. Effects of other variables*

*Respondent's exposure to mass services during childhood:* This variable is included as one of the independent variables in order to arrive at net effects of the mother's and the father's inputs. It relates to the respondent's mass attendance ( $I=2,3$ ) when he was 12 years old<sup>23</sup>. Excluding this variable does not change the basic results that relate to parental inputs (in terms of relative magnitude and of significance). The various coefficients are somewhat smaller when this variable is not included due to its positive correlation with parental inputs (for instance, in the

---

<sup>22</sup> Alternatively, it is possible to run the 'religiosity equations' on the extended sample and add the option of  $R=0$  to the dependent variable (to mass attendance and to prayer). However, this will result in a less homogenous sample and will not yield a clear distinction between  $R=0$  and  $R>0$ .

<sup>23</sup> Based on questions #30: "When you were 11-12 years old, how often did you 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). The alternatives are identical to those related to parental mass attendance. Therefore here too the nine options are reduced to three categories ( $I=1, 2, 3$ ), that are identical to the three categories for parental mass attendance.

female sample, the effect of  $lm_f=2$  on mass participation increases from 0.905 to 1.001 and the effect of  $lm_f=3$  increases from 1.332 to 1.536. In the male sample, the effect of  $ld_f=2$  on mass participation goes up from 0.759 to 0.802 and the coefficient of  $ld_f=3$  increases from 1.143 to 1.272).

The effect of childhood religious exposure is also interesting by itself (in addition to its role to net out the effects of parental inputs): Exposure to mass attendance during childhood has a positive significant effect on the respondent's current mass participation, but only if he was intensively exposed to mass services ( $l=3$ ). Regression coefficients of  $l=2$  are not significant in mass participation equations of the two genders. Also, the effect of own exposure is less pronounced than the effect of parental mass attendance (a coefficient of 0.886 versus 1.332 in the female sample and respective coefficients of 0.716 and 1.143 in the male sample). It appears that the same gender parent serves as a role model and his participation in mass services is more influential on future mass participation than own exposure.

Interestingly, own exposure to mass services has a stronger effect on current prayer habits than on current mass participation (respective coefficients of 1.048 and 0.886, for  $l=3$  for women; coefficients of 1.114 and 0.716, for  $l=3$ , for men). Also, prayer is more affected by own childhood experience of mass participation than by watching the parent attending mass services. This whole set of findings indicates that the intimate/private activity of prayer is more closely related to religious private experience during childhood than the more social/public activity of mass participation.

*The effects of socio-economic and geographical variables* (see Appendix A that presents average characteristics of the female and male sample): The various background variables also have the role of netting out the marginal effects of parental inputs. Their effects have been extensively discussed in Branas-Garza and Neuman (2004)<sup>24</sup>.

---

<sup>24</sup> Note, that Branas-Garza and Neuman (2004) is employing a different sample that includes all respondents and not only Catholics with Catholic parents. Also, geographical residence variables have not been included. The results are therefore not fully compatible.



Most pronounced is the effect of advanced age on religious behavior. This reflects both cohort effects and age effects that are related to the salvation motive. Age effects are much more pronounced in the female sample. Marital status and number of children do not affect women's religiosity. Married men tend to go to church more often and the number of kids has a negative effect on male prayer habits. Schooling has a positive significant effect on the intensity of religious behaviour of the two genders<sup>25</sup>.

Three socio-geographical variables have also been included: the population size in the city of residence; its location (whether it is within the metropolitan area of a big city) and the geographical region. The size of the city was included using several dummy variables that relate to different sizes of city population (10,000 or less; 10,001-to-100,000; 100,001-to-1,000,000; over one million inhabitants). The number of dummies was then reduced to one: 10,000 inhabitants or less with the reference group of more than 10,000, due to insignificant differences between all the rest. As indicated by Table 6, women in small rural cities go to church more often, reflecting socializing motives of church attendance. They also have a slight tendency to pray more (at a significance level of 10%). The effects of the small city are not prevalent for men. Men (but not women) are affected by the metropolitan location of their place of residence- those living within metropolitan areas of big cities go to church more, reflecting social networking motives. They are also more active in praying. We do not have a reasonable explanation for this finding.

In order to control for regional differences, 16 region dummy variables have been added (not reported in Table 6, Cantabria is the reference group). All region dummies are insignificant in the women's religiosity regressions, indicating no significant effect of the regional location. In the male equations, only residents of Castilla la Mancha go to church significantly more than all others (coefficient of 1.376,  $z=2.11$ ). The size of the coefficient is quite impressive- larger even compared to  $Id=3$ . Here too, this finding is a reflection of social/cultural motives of

---

<sup>25</sup> Personal income and household income have also been included as explanatory variables. Both turned out to have insignificant effects. Probably, due to measurement errors and many missing values.

church attendance: Castilla la Mancha is the most traditional, old-style, rural region of Spain and going to church is integrative component of tradition and culture.

## 5. Summary and Discussion

This paper addresses a fundamental question of the parental role in shaping the individual's religiosity. The basic statement that is formulated and tested empirically is that parents transmit 'religious capital' to their offspring via a process of serving as role models and exposing him during his childhood to mass attendance. This exposure serves as an input that helps him to produce his stock of 'religious capital' that is reflected in his current church attendance and prayer habits.

The analysis of the intergenerational transmission of 'religious capital' from parents to their offspring is presented within a setting of an economic framework of a production function of 'religiosity' where parental inputs serve as factors of production. Several testable hypotheses are derived and presented.

To test the hypotheses we use a large representative Spanish database of Catholics. The parental inputs are the mother's and father's intensity of church attendance during the individual's formative years of childhood. The output is the respondent's current religiosity level as reflected by two different dimensions: mass attendance and prayer. Socio-economic background variables, that might affect religiosity, are also considered.

The paper has several innovative features:

- Unlike most empirical papers that proxy the individual's religiosity using church attendance, we have data on two different dimensions of religiosity, namely, mass attendance and prayer habits<sup>26</sup>. These two facets of religiosity have different motives and a comparison of the production processes of the two, adds to our

---

<sup>26</sup> Adsera (2006) uses the dichotomous variable practicing/non-practicing Catholic, that combines elements of all types of religious practice. However, it is not well defined and provides very limited information due to its dichotomous nature.

understanding of religious behaviour and in particular of the inter-generational transmission of 'religious capital'.

- Moreover, in most empirical studies church attendance is a dichotomous variable (yes or no) while we have information on the intensity of church attendance that has six alternative levels. For prayer we have eleven alternative levels that reflect the intensity of prayer. This information is most valuable and enables the estimation of Ordered Logit 'religiosity equations' and the derivation of more robust conclusions.

- Separate information on maternal and paternal religious inputs and on religiosity of female and male respondents facilitates a comparison of the differential effects of the mother and father on daughters and sons, thus improving our understanding of gender roles and gender differences in the process of transmitting religious values and attitudes.

- Information on the respondent's own exposure to mass services when he was a child, facilitates the netting out of the parental effects and also leads to a more comprehensive understanding of the inter-generational transmission process.

The main and most interesting findings are the following:

- There is clear evidence of inter-generational transmission of 'religious capital' BUT only from the same gender parent: the mother has a significant impact only on the daughters' religiosity, while the father significantly affects only the sons' religious behaviour. The effects are not linear - in some cases only an intensive practicing mother/father ( $I=3$ ) has an impact on the individual's religiosity. Parents of the same gender serve as role models and play a crucial role in the process of building and formatting the individual's stock of religiosity. Parental religious inputs also affect positively the tendency to stay Catholic and not 'convert out'.

- There is a closer relationship between parental input and the respondent's current mass attendance compared to the link between the former and his prayer habits.

- Prayer is more closely related to the respondent's own exposure to church services when he was a child than to the parental example of church attendance. This might indicate that the private/intimate practice of prayer is transmitted mainly through own experience rather than via 'simulation' of parental religious practice.

- There are no interactions between the effects of the two parents. Moreover, homogenous parental inputs ( $lm_i = ld_i$ ) do not add to the separate effects of the mother and the father. This also follows from the insignificant effect of the other gender parent on the respondent.

- The effect of the experience of exposure to parental mass attendance during the individual's childhood is persistent and does not erode as time passes by and the respondent gets older and more distant from this experience.

- Parental impact is, generally, larger for women. This is another example of the specialization of women towards religious tasks. These findings also comply with theories of the Sociology of Religion that claim that women have a larger taste for religiosity compared to men.

Religion within the European Union is one of the focal topics on the research agenda of the Union. We believe that the study presented in this paper forms one of the building blocks of this line of research and hope that more studies will follow and improve our understanding of the multi-cultural religious patterns in Europe.

## References

- Adserá, A., "Marital fertility and Religion in Spain," *Population Studies*, forthcoming
- Azzi, C. and Ehrenberg, R.G. (1975), "Household Allocation of Time and Church Attendance," *Journal of Political Economy* 83(1): 27-56.
- Beit-Hallahmi, B. (1997), "Biology, Density and Change: Women's Religiosity and Economic Development," *Journal of Institutional and Theoretical Economics* 153: 166-178.
- Bisin, A. and Verdier, T. (2000), "Beyond The Melting Pot: Cultural Transmission, Marriage, And The Evolution Of Ethnic And Religious Traits," *The Quarterly Journal of Economics* 115(3): 955-988.
- Bisin, A. and Verdier, T. (2001), "The Economics of Cultural Transmission and the Dynamics of Preferences," *Journal of Economic Theory* 97: 298-319.
- Boyd, R. and Richerson, P. (1985), *Culture and the Evolutionary Process*, Chicago IL: University of Chicago Press.
- Brañas-Garza, P. and Neuman, S. (2004), "Analyzing Religiosity within an Economic Framework: The Case of Spanish Catholics," *Review of Economics of the Household* 2(1): 5-22.
- Brañas-Garza, P. (2004), "Church Attendance in Spain: Secularization and Gender Differences," *Economics Bulletin* 26(1):1-9.
- Cavalli-Sforza, L. L. and Feldman, M. (1973), "Cultural versus Biological inheritance: Phenotypic Transmission from Parent to Children," *American Journal of Human Genetics* 25: 618-637.
- Cavalli-Sforza, L. L. and Feldman, M. (1981), *Cultural Transmission and Evolution: A Quantitative Approach*, Princeton: Princeton University Press.
- Clark, C. A. and Worthington, A. (1987), "Family Variables Affecting the Transmission of Religious Values from Parents to Adolescents: A Review," *Family Perspective* 21: 1–21.
- Cornwall, M. (1988), "The Influence of Three Agents of Religious Socialization," In: *Religion and Family Connection: Social Science Perspectives*, Darwin, L.T. (ed.), Provo, UT: Brigham Young University Press.
- Erickson, J. A. (1992), "Adolescent Religious Development and Commitment: A Structural Equation Model of the Role of Family, Peer Group, and Educational Influences," *Journal for the Scientific Studies of Religion* 31: 131–152.
- Grossbard-Shechtman, S. Amyra and Neuman, S. (1986), "Economic Behavior, Marriage and Religiosity," *Journal of Behavioral Economics* 15: 71-86.
- Hayes, B. C., and Pittelkow, Y. (1993), "Religious Belief, Transmission, and the Family: An Australian Study," *Journal of Marriage and the Family* 55: 755–766.
- Heaton, T. (1986), "How Does Religion Influence Fertility? The Case of Mormons," *Journal for the Scientific Study of Religion* 28: 283–299.

- Hoge, D. R., Petrillo, G. H. and Smith, E. I. (1982), "Transmission of Religious and Social Values from Parents to Teenage Children," *Journal of Marriage and the Family* 44: 569–580.
- Iannaccone, L. R. (1990), "Religious Practice: A Human Capital Approach," *Journal for the Scientific Study of Religion* 29(3): 297-314.
- Iannaccone, L. R. (1998), "Introduction to the Economics of Religion," *Journal of Economic Literature*, 36: 1465-1496.
- Iannaccone, L. R. (2003), "Looking Backward: A Cross-national Study of Religious Trends," *Mimeo*.
- Johnson, R. A. (1980), *Religious Assortative Marriage in the United States*. New York, NY: Academic Press.
- Kahneman, D., Wakker, P.P. and Sarin, R., (1997), "Back to Bentham? Explorations of Experienced Utility," *The Quarterly Journal of Economics*, 112: 375-405.
- Lehrer, E. L. (1996), "Religion as a Determinant of Marital Fertility," *Journal of Population Economics* 9: 173-196.
- Long, S. H. and Settle, F.R. (1977), "Household Allocation of Time and Church Attendance: Some Additional Evidence," *Journal of Political Economy* 85(2): 409-13.
- Neuman, S. (1986), "Religious Observance within a Human Capital Framework: Theory and Application," *Applied Economics* 18:11: 1193-202.
- Ozorak, E. W (1989), "Social and Cognitive Influences on the Development of Religious Beliefs and Commitment in Adolescence," *Journal for the Scientific Study of Religion* 28: 448–463.
- Schoen, R. and Weinick, R.M. (1993), "Partner Choice in Marriages and Cohabitations," *Journal of Marriage and the Family* 55: 408-414.
- Thomson, E. McLanahan, S. and Curtin, R. B. (1992), "Family Structure, Gender, and Parental Socialization," *Journal of Marriage and the Family* 54: 368–378.
- Ulbrich, H. and Myles, W. (1983), "Church Attendance, Age, and Belief in the Afterlife: Some Additional Evidence," *Atlantic Economic Journal* 11(2): 44-51.

**Table 3**

**Dependent Variable: Respondents' Mass Attendance and Prayer, Descriptive Statistics**  
**Catholic Spanish Women and Men, 1998**

<b>Mass Attendance</b>	number (total)	% total	% among women	% among men	<b>Prayer</b>	number (total)	% total	% among women	% among men
never (1)	362	18.9	14.5	24.3	never (1)	326	17.0	11.0	25.2
once a year (2)	232	12.1	10.3	14.4	once a year (2)	83	4.3	3.1	5.8
1-2 times a year (3)	471	24.6	23.1	26.4	twice a year (3)	106	5.5	3.1	8.5
once a month (4)	119	6.2	7.4	4.8	few times a year (4)	249	13.0	11.7	15.1
2-3 times/month (5)	185	9.7	11.7	7.1	once a month (5)	66	3.4	3.1	3.9
every week (6)	511	26.7	31.9	20.2	2-3 times a month (6)	130	6.8	7.0	6.5
					almost every week (7)	126	6.7	7.8	5.0
					every week (8)	174	9.3	9.7	8.3
					several times a week (9)	135	7.3	8.1	5.7
					once a day (10)	383	20.3	26.8	11.6
					several times a day (11)	109	5.6	8.0	2.8
sample size	1880		1048	832	sample size	1887		1049	838
mean	3.56		3.88	3.17	mean	6.05		6.98	4.90
median	3		4	3	median	6		8	4
mode	6		6	3	mode	10		10	1

**Note:** - The sample includes Catholic individuals with two Catholic parents

**Table 4**  
**Parental Effect on Respondents' Religiosity, Measured by Mass Attendance and by Prayer**  
**Catholic Spanish Women and Men, 1998**

Parental inputs: $(Im_i, Id_i)$ Gender of sample	Mass Attendance											
	(1,1)		(2,2)		(3,3)		(2,1)		(3,1)		(3,2)	
	Women	men	women	men	Women	men	women	men	women	men	women	men
sample size	123	67	137	121	395	315	79	53	76	63	127	109
mean	2.62	1.94	3.50	3.02	4.56	3.94	3.32	2.28	3.82	2.67	3.97	3.18
mode	1	1	3	3	6	6	3	1	6	1	6	3
median	2	2	3	3	5	4	3	2	4	2	4	3

Parental inputs: $(Im_i, Id_i)$ Gender of sample	Prayer											
	(1,1)		(2,2)		(3,3)		(2,1)		(3,1)		(3,2)	
	Women	men	women	men	women	men	women	men	women	men	women	men
sample size	122	71	137	123	390	311	82	58	78	64	127	108
mean	5.56	3.48	5.78	4.28	7.90	6.10	6.32	4.21	7.27	4.14	7.25	4.67
mode	1	1	4	1	10	10	10	1	10	1	10	4
median	6	1	5	4	9	7	7	3	9	3	8	4

**Notes:** - Respondent's Mass Attendance is based on question #50b: "How often do you attend **mass** services at the church?" Has 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)  
- Respondent's Prayer is based on question #31: "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)



**Table 6**  
**Ordered Logit Religiosity Functions, by Gender**  
**Catholic Spanish Women and Men, 1998**

Dependent and independent variables	Women		Men	
	Mass	Prayer	Mass	Prayer
The mother's input (mass attendance level):				
$lm_f=2$	0.905 (3.43)	0.482 (1.84)	0.372 (1.06)	0.483 (1.34)
$lm_f=3$	1.332 (4.95)	0.903 (3.37)	0.403 (1.16)	0.465 (1.31)
The father's input (mass attendance level):				
$ld_f=2$	-0.008 (0.04)	-0.204 (1.01)	0.759 (3.06)	0.227 (0.96)
$ld_f=3$	0.376 (1.72)	-0.117 (0.55)	1.143 (4.24)	0.690 (2.66)
Respondent's mass attendance at the age of 12:				
$l=2$	0.472 (1.48)	0.563 (1.76)	0.173 (0.55)	0.753 (2.44)
$l=3$	0.886 (2.96)	1.048 (3.54)	0.716 (2.44)	1.114 (3.83)
Socio economic/geographical background variables:				
Years of schooling	0.037 (2.31)	0.030 (1.93)	0.042 (2.43)	0.041 (2.31)
Age: 31-to-45	0.634 (3.10)	0.285 (1.44)	0.463 (1.78)	0.179 (0.69)
Age: 46-to-60	1.429 (6.18)	1.332 (5.90)	0.325 (1.07)	0.572 (1.90)
Age: over 60	2.110 (8.49)	2.128 (8.80)	1.401 (4.46)	1.220 (3.94)
Marital status: married	-0.019 (0.12)	0.073 (0.49)	0.634 (2.79)	0.282 (1.26)
Number of children	-0.052 (1.17)	0.016 (0.37)	-0.063 (1.11)	-0.125 (2.31)
City population: 10,000 or less	0.500 (2.98)	0.239 (1.52)	0.104 (0.56)	0.082 (0.46)
Location: metropolitan	0.130 (0.67)	0.187 (0.96)	0.576 (2.48)	0.552 (2.33)
Sample size	790	790	585	585
Pseudo $R^2$	0.1141	0.0751	0.1085	0.0560

**Notes:** - Z-statistics in parentheses  
- Region dummy variables (16 dummies with Cantabria as the reference group) have also been included (not reported to save space). All coefficients are insignificant, except the coefficient of Castilla la Mancha in the male mass participation equation which is 1.315 (2.03)

## APPENDIX: Sample Characteristics

As Table 1 in the Appendix shows, the respondents are heterogeneous in terms of age and education, reflecting the diversity of the Spanish population. About 25% of both men and women fall into each age group: 18-to-30; 31-to-45; 46-to-60 and over 60. The average age of women is 46 (ranging from 18 to over 91, standard deviation of 18). Men have an almost identical age distribution with an average 45.5, a range of 18-93 and a standard deviation 18.

The men are slightly more educated than the women. The average number of years of schooling is 10.3 for men and 9.5 for women, with a standard deviation of around 5 for both groups. This is also reflected in the distribution of the level of formal education – 17% women and 13% men have not completed primary school, while 34% women, compared to 41% men, have some academic education (including college, polytechnic and university). The percentages of primary- and secondary-school graduates are similar for men and women (around 25% of the men and women in each group)<sup>i</sup>.

About two thirds of women and of men in the survey are married and the average number of children at home is 1.8, ranging from 0 to 12<sup>ii</sup>.

As evidenced in many other countries, women earn less than men. Women and men in our sample have a similar age distribution and the men are only slightly more educated than the women. Yet we find more men than women in the higher monthly income intervals: 9.4% men and 6.7% women have monthly incomes between 200 and 500 thousand pesetas. A mere 0.7% men and 0.3% women earn more than 500 thousand pesetas. The great majority of women (70%) earned less than 100 thousand pesetas compared to 37% men. This group included respondents who did not participate in the labor force. The majority of men (53%) have a monthly income ranging from 100-to-200 thousand pesetas. The parallel figure for women is 23%.

The monthly family income distribution is more similar for women and men. The majority of respondents have a household income in the 100-to-200-thousand peseta range. Less than 4% (2.4% female respondents and 1.6% male respondents) enjoy a household income of over 500 thousand pesetas. Around one quarter are in the under-100- and 200-to-500 thousand peseta range. Comparing the distribution of personal versus family income, shows that women 'moved up', reflecting the fact that a significant proportion either work part-time or not all.

About one quarter of women and of men live in small rural towns (with a population of 10,000 inhabitants or less). Around one third of our respondents live in medium-size cities of 10,001-to-100,000 residents, close to 30% reside in large cities (population of 100,001-to-1,000,000) and around 10% have their homes in very large cities of over one million inhabitants. Fifteen percent live in metropolitan areas.

The regional distribution reflects the population sizes of the 17 Spanish regions: The largest are the regions of Andalucia, Cataluña, Madrid and Valencia (with 11-to-18 percent of population) and the smallest is La Rioja with less than 1% of the population.

**APPENDIX TABLE 1**  
**Sample Characteristics, by Gender**  
**Spanish Women and Men, 1998**

Variables	Women	Men
Years of schooling	9.518 (5.50)	10.294 (5.36)
Formal education (%)		
did not complete primary	17.468	12.991
primary	26.835	23.590
secondary	21.392	22.564
academic	34.304	40.855
Age (years)	46.244 (18.33)	45.526 (18.32)
Age groups (years) (%)		
18-to-30	26.582	25.470
31-to-45	24.304	26.667
46-to-60	22.025	23.590
Over-60	27.089	24.273
Number of children at home	1.862 (1.61)	1.836 (1.55)
Monthly personal income (in thousands of pesetas) (%)		
less than 100	70.000	37.192
between 100 and 200	23.030	52.709
between 200 and 500	6.667	9.360
over 500	0.303	0.739
Monthly family income (in thousands of pesetas) (%)		
less than 100	29.906	23.776
between 100 and 200	47.290	50.116
between 200 and 500	20.374	24.476
over 500	2.430	1.632
Married (%)	61.139	64.957
Residence population (%)		
10,000 or less	26.582	27.692
10,001-to-100,000	33.797	34.017
100,001-to-10 <sup>6</sup>	28.607	27.521
over 10 <sup>6</sup>	11.012	10.769

Live in metropolitan areas (%)	15.949	14.871
Region (%)		
Andalucía	17.341	17.777
Aragón	2.911	2.905
Asturias	3.924	3.076
Baleares	2.025	2.051
Canarias	3.924	3.589
Cantabria	1.265	1.880
Castilla La Mancha	4.050	4.786
Castilla León	6.582	8.717
Cataluña	15.316	12.820
Valencia	11.012	11.111
Extremadura	2.784	1.880
Galicia	6.329	6.837
Madrid	12.151	12.136
Murcia	3.164	3.247
Navarra	1.772	1.709
País Vasco	4.683	4.957
La Rioja	0.759	0.512
Sample size	790	585

**Notes:** - The samples include Catholic individuals who were raised in Catholic households.  
- Numbers in parentheses are standard deviations.  
- The means of Monthly family income are based on smaller samples (535 women and 429 men) due to missing data and the means of Monthly personal income are based on even smaller samples (330 women and 406 men) due to missing values.

---

**End Notes** (for Appendix):

<sup>i</sup> Among 15 European countries, Spain ranked second from last, and Portugal last (at 37.7%) in percentage of population (aged 25-to-59) with at least a secondary-school education. Germany ranked first with 81.6%.

<sup>ii</sup> Lehrer (1996) predicted that spouses with the same religious affiliation would have lower divorce rates and more children than couples with different religious affiliations. This hypothesis is not supported by our data: while in the great majority of couples (over 95%), both spouses are Catholic, they have quite low fertility rates.