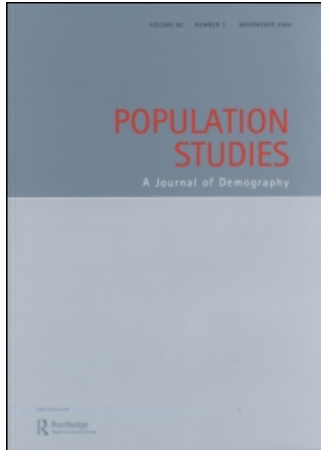


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Alicia Adsera^a
^a Princeton University,

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Reply to the note by Neuman 'Is fertility indeed related to religiosity?'

Alicia Adsera
Princeton University

[Submitted November 2006; Final version accepted February 2007]

Introduction

Neuman uses the rich information on religion contained in the International Social Survey Programme 1998: Religion II (ISSP 98) to estimate fertility equations similar to those in my paper. She concludes that current religiosity is not related to the number of children a woman has and that my findings are due to a misspecification of the religiosity measure. In this reply I argue that her results rely on the use of a group of women already selected for their attachment to the Catholic Church. I include new analyses with the ISSP 98 data-set to show that the positive relation between attendance at mass and fertility holds in a sample that includes those who have ever been baptized regardless of the background of their spouses. Further, I explore an alternative measure of religiosity in the ISSP 98. Finally I make some clarifications of the findings in the paper and their relevance to the explanation of recent fertility changes in Spain.

Fertility and religiosity

I agree with Neuman that the available data on religiosity in the Spanish Fertility Surveys (SFS), and in the major data-sets used in this field, are rather limited compared with the data available from the 1998 ISSP survey, the relevant module of which is specifically devoted to the study of religion. To measure religiosity she uses current mass attendance on a scale from 1 (never) to 6 (every week). In addition she includes current frequency of praying and background information on the religiosity of the parents and the individual as a child. Her analyses are welcome additions to research on the subject.

Even though Neuman sets out to replicate my fertility equations in her data-set, several issues limit the comparability of our analyses. First, the ISSP 98 does not include spouse's education or years of

marriage and combines married individuals with those living as married whereas my estimates referred to married women only. The exclusion of years of marriage might matter, for example, if there were important changes among cohorts and across religious groups in the timing of marriage. To improve the comparability of the analyses, I have re-run all my analyses for the 1985 and 1999 SFSs with unmarried couples included and with variables missing in the ISSP excluded. None of the main findings is affected. Second, Neuman's sample is rather small and this could influence the interpretation of some of her results. For example, the differences between the estimated regional dummies, shown in her original analysis (Brañas-Garza and Neuman 2006), are much larger than any interregional fertility differences across Spain. They might be driven by outliers since, by my account, out of the 17 regions in Spain, 11 contain ten or fewer individuals in her final sample.

By far the most salient difference between her analyses and mine are the selection criteria used for the samples. Neuman argues that to understand the relation between religiosity and fertility, the sample should be restricted to Catholics. My results in the 1999 SFS are robust to limiting the sample to practising and non-practising Catholics, but Neuman goes a step further. Her final sample comprises women who are not only currently Catholic, but who were also raised by two Catholic parents and who are married to a Catholic spouse (Brañas-Garza and Neuman 2006). Thus, women who are currently Catholic but who declare no affiliation as children or who are married to non-Catholics are excluded from her sample. By applying such strict inclusion criteria she is effectively selecting the group of women (and couples) likely to be more attached to the Catholic Church and, as a result, reducing the variance within the sample. To show how these inclusion rules can affect the results I constructed two samples from the ISSP 98. The first one

comprises all individuals who declared either Catholic affiliation as children or current Catholic affiliation or both, regardless of the religious background of their spouses and parents. Essentially the sample includes all women less than 50 years of age, married or living as married, and who were baptized at some point in their lives. I constructed the second sample by closely following Neuman's guidelines to the best of my understanding, though this sample of 246 women turned out to be a bit larger than hers.

A simple estimate of the relationship between current family size and mass attendance, without additional controls, shows that both variables are positively associated in both samples. The coefficient of mass attendance is 0.166 with a *t*-statistic of 4.57

in the first sample and 0.131 with a *t*-statistic of 3.12 in the second sample. Table 1 presents estimates when controls are added. Column (1) uses the most complete specification with the sample selected according to Neuman's criteria. As in Neuman's analysis, current mass attendance is not significant, by itself or even jointly with frequency of praying and childhood attendance. To see how the results change in a less restricted sample, the results shown in columns (2)–(5) use model specifications similar to those in Neuman's Table 2, but with the sample that comprises baptized Catholics and with no restrictions imposed on their parental or spousal background. In columns (2) and (5) the coefficient of mass attendance is positive and significant at the

Table 1 Ordinary least squares estimates of the effects on current family size of current frequency of attendance at mass and current frequency of praying, and attendance at mass when respondent was aged 12, among married Catholic women, Spain 1998

	(1)	(2)	(3)	(4)	(5)
Current religiosity					
Frequency of mass attendance	0.050 (0.99)	0.081** (2.30)	0.068* (1.67)	0.079* (1.84)	0.091** (2.43)
Frequency of praying	0.000 (0.01)		0.010 (0.48)	0.015 (0.65)	
Mass attendance when respondent was aged 12					
Respondent	0.033 (0.70)			0.056 (1.36)	
Mother	–0.107** (2.47)			–0.097** (2.66)	
Father	0.024 (0.81)			0.025 (0.93)	
Distance between parents in frequency of attendance					–0.065** (2.22)
<i>F</i> (2) Joint test: current attendance and frequency of praying	0.60 Prob > <i>F</i> = 0.551		2.43* Prob > <i>F</i> = 0.089	2.93* Prob > <i>F</i> = 0.055	
<i>F</i> (3) Joint test: current and childhood attendance and frequency of praying	0.79 Prob > <i>F</i> = 0.502			3.36** Prob > <i>F</i> = 0.019	
Sample size	246	331	327	300	314
Adjusted <i>R</i> ²	0.30	0.25	0.25	0.27	0.26

Notes:

1. Method: ordinary least squares with robust errors.

2. Absolute *t*-statistics in parentheses.

3. The sample comprises women married or living as married, aged 18–49. For column (1), the sample is restricted to current Catholics raised as Catholics by Catholic parents and with a Catholic spouse. For columns (2)–(5), the sample comprises all former and/or current Catholics regardless of family's or spouse's religious background.

4. For categories used to measure variation in religiosity variables, see notes under Neuman's Table 2.

5. Regression models use the following as control variables: age, years of education, size of city, region of residence, and birth cohort. Birth cohort 1948–59 is the benchmark.

p* < 0.10; *p* < 0.05.

Source: International Social Survey Programme: Religion II 1998.

Table 2 Ordinary least squares estimates of the effects on current family size of current self-reported religiosity and frequency of attendance at mass when respondent was aged 12 among married Catholic women, Spain 1998

	(1)	(2)	(3)	(4)
Current religiosity				
Self-reported religiosity	0.117* (1.66)	0.145* (1.85)	0.190** (3.44)	0.216** (3.31)
Mass attendance when respondent was aged 12				
Respondent		0.031 (0.64)		0.043 (1.02)
Mother		-0.110** (2.65)		-0.096** (2.72)
Father		0.027 (0.91)		0.026 (0.99)
<i>F</i> (2) Joint test: self-reported religiosity and childhood attendance		2.78* Prob > <i>F</i> = 0.0642		9.10** Prob > <i>F</i> = 0.0001
Sample size	263	246	331	300
Adjusted <i>R</i> ²	0.29	0.31	0.27	0.29

Notes:

1. Method: ordinary least squares with robust errors.

2. Absolute *t*-statistics in parentheses.

3. The sample comprises women married or living as married, aged 18–49.

4. For columns (1) and (2), the sample is restricted to current Catholics, raised as Catholics by Catholic parents, and with a Catholic spouse. For columns (3) and (4), the sample comprises all former and/or current Catholics regardless of family's or spouse's religious background.

5. Self-reported religiosity is measured on a scale of 1–7: extremely non-religious (1); very non-religious (2); somewhat non-religious (3); neither religious nor non-religious (4); somewhat religious (5); very religious (6); extremely religious (7). For categories used to measure variation in other religiosity variables, see Neuman's Table 2.

6. Regression models use the following as control variables: age, years of education, size of city, region of residence, and birth cohort. Birth cohort 1948–59 is the benchmark.

p* < 0.10; *p* < 0.05.

Source: International Social Survey Programme: Religion II 1998.

5-per-cent level and in column (3) it is significant at the 10-per-cent level, both alone and jointly with the frequency of current praying. The high correlation between attendance and frequency of praying (around 0.5) introduces multicollinearity in the estimates that explains the decrease in significance of the coefficient for mass attendance. When measures of past mass attendance of both parents and of the individual at 12 years of age are added, in column (4), the coefficient for current mass attendance is significant by itself and jointly with both current frequency of praying and childhood mass attendance. The size of the coefficient for current mass attendance implies that, on average, a woman who never attends mass would have around 0.25 children fewer than one who attends once a month and 0.4 fewer than one who attends once a week.

A complete understanding of the relationship between religiosity and fertility behaviour may require also an investigation of the relationship between the latter and subjective religiosity (i.e.,

religiosity as reported by survey respondents)—in addition to the analysis of the association between actual religious practice and the decision to have children. The ISSP 98 survey contains a question that asks the individual to rate the extent to which he or she is a religious person on a scale of 1–7. Around 56 per cent of the 2,488 respondents report themselves as being 'somewhat' or more religious (scores = 5–7). Fifty-four per cent of women in my unrestricted sample report themselves as 'somewhat' or more religious (44 per cent as 'somewhat religious' and the remaining 10 per cent as 'religious' or 'highly religious'). Among the 54 per cent who consider themselves somewhat or more religious, only 47 per cent attend mass at least once a month. The correlation between this measure of religiosity and mass attendance is 0.53 in the large sample of baptized Catholics and 0.43 in the restricted sample. (This may explain the mismatch shown by Neuman in her Table 1 between the percentages of practising and non-practising Catholics as measured

by self-report in the SFS 1999 and the frequency of mass attendance in the ISSP 98.) This less-than-perfect correlation does not imply, however, that self-identification questions are completely useless. They provide a subjective measure of religious affiliation that seems complementary to the objective measures and that is likely to capture some nuances in the meaning of religiosity that are missed by the latter measures. Self-perception of being or not being a practising Catholic (or, in the ISSP, of being or not being religious) should be relevant if it is associated with the particular beliefs and, in turn, behaviour of individuals. Even if, as noted in my paper, access to and use of family planning is relatively similar across all groups in Spain, self-reporting of religiosity may go hand in hand with different preferences in family size and different childbearing choices.

To the question of whether it is possible to compare 1985 and 1999 measures of religious identification, I would say it is possible, with some qualifications. In a relatively secular society, like Spain today, an individual attending mass once every 2 weeks would probably be considered a devout Catholic, whereas attendance weekly or even daily would have been the standard in some regions of Spain 20 or 30 years ago. Indeed Neuman makes the same point in her note when she states that in a secular society, going to church a few times a year might be considered to be practising religion. The key issue is whether attachment to religion within a society at a point in time is associated with particular patterns of reproductive behaviour at that point. For example, in a paper that studies differences among desired number of children across OECD countries (Adsera 2006b) I find that practice (attendance at church at least 2 or 3 times a month) is not, as it is elsewhere, a key variable in the explanation of fertility preferences in Eastern Germany and Japan. In countries where large percentages of respondents have no religion, and where either previous political pressures (Eastern Germany) or the weaker requirement of weekly participation among affiliations (common in Japan) account for the low rates of attendance, the mere identification with a religious group has significant implications for desired family size.

In Table 2 I substitute current mass attendance and frequency of praying for the former measure of self-reported religiosity. Current religiosity is positively related to current family size and is significant at the 10-per-cent level in a sample that follows Neuman's criteria (columns (1) and (2)) and at the 1-per-cent level in the sample of former/current Catholics (columns (3) and (4)).

It is important to recognize that claims of causality are not warranted for any of the contemporaneous measures of current religiosity, whether self-reported religiosity or self-reported frequency of attendance at mass, but they are valuable in showing the intensity of the association between religion and fertility (Waite and Lehrer 2003). Childhood mass attendance, in contrast, is a measure not contaminated by current behaviour. Both in Neuman's and in my analysis, the coefficient for childhood attendance is positive but insignificant when controls are added. This index might be used to answer a slightly different question from the one posed in the analyses above, namely, whether exposure to Catholicism during childhood has any impact on subsequent fertility behaviour. However, there are two reasons for caution in using that measure to draw any conclusion about causality. First, there may be problems of selective recollection, particularly if the individual recalls attendance at mass as a child as having been a negative experience. Secondly, in a sacralized society, such as Spain during the Franco regime, compulsory (daily) attendance at mass in many schools may alter the true meaning of the measure as a proxy of the family's religiosity at the time. In fact the correlation between respondent's report of frequency of attendance as a child and frequency of parents' attendance is around 0.5, and on average respondents report having attended mass more frequently than their parents did.

Family background

As in Neuman's analysis, the coefficient for mother's church attendance is negative and highly significant whereas that for father's attendance is positive (though not significant) in Tables 1 and 2. When both parents attended church, the effect of father's attendance compensates for that of the mother's to some degree. I would like to elaborate on Neuman's interpretation of this interesting finding. First, parental attendance is a retrospective measure and as such it is susceptible to selective recollection. Women for whom church attendance has negative associations may have a biased (magnified) recall of their mother's true attendance. This may explain in part the relatively low correlation between individual's current and parents' past attendance (0.28 with mother's attendance and 0.31 with father's). Second, the correlation between mother's attendance and father's attendance is 0.62 and this raises concerns for multicollinearity.

In general, mother's mass attendance is reported to be much higher than that of father's. In the sample in column (3) in Table 1, around 40 per cent of the mothers attended mass weekly or more often (8.5 per cent more than weekly), whereas only 24 per cent of the fathers did so (2 per cent more than weekly). I have explored an alternative specification by creating mutually exclusive dummies for the cases when only the mother attends at least once a month (22.5 per cent of the couples), when only the father does so (1 per cent), when both do so (48.2 per cent), or when neither of them do so (28.3 per cent). In estimates not shown here I find that, when there is a mismatch between the attendance at mass of the father and that of the mother, the joint effect on current family size is negative, unlike the cases where parents' behaviour is similar—practising or not. In column (4) of Table 1 I replace the two variables of parental attendance with an index that measures the absolute distance between the coded frequencies of mass attendance for both parents. The coefficient is negative and highly significant, suggesting that wide differences in religious practice between parents, or whatever explains those differences, may lead to a preference for smaller families in their offspring.

Finally, Neuman interprets the father's positive coefficient as an indication of daughter's fulfilment of their father's inclination towards larger families. This only makes sense if religiosity is positively related to fertility (at least in the father's generation). It may simply indicate that women marry men who remind them of their fathers and who are either both religious and fond of large families, or just the latter.

Minority affiliations

Apparently Neuman misreads Hypothesis 2 in my paper. I do not state that, in general, individuals in minority churches are likely to have larger families. Rather, on the basis of findings by Stark and Iannaccone (1994), I argue that they are likely to be more mobilized within their religious affiliation and to follow more closely their teachings than individuals belonging to dominant churches. If those teachings are pronatalist, then those individuals can be expected to have relatively large families. Because of the limited information on religion in the SFS, I do not have a measure of the religiosity of women who belong to Muslim or (mostly conservative) Protestant religions, but from their minority status I expect them to be closely identified with

their denominations (Stark and Iannaccone 1994). The literature shows that both of these groups can be considered relatively pronatalist in Spain (Goldscheider and Mosher 1991; Lehrer 1996; Morgan et al. 2002) and I find that indeed they tend to have more children than non-practising Catholics. A similar example can be found among Palestinians in occupied territories (Khawaja 2000). Of course, if these minorities belonged to religious groups that encouraged population control, the expected result should be the opposite.

Religious composition of the couple

I acknowledge that the definition of inter-faith marriage as one between a practising and a non-practising Catholic is an unusual one. I undertook the analysis as an exploratory exercise and, as I showed in my paper (pp. 208, 213, and 217), the results are very mixed. They do not fully support a forward-looking hypothesis which suggests that couples restrain their fertility in anticipation of future marital instability (Becker et al. 1977). The similarity in the transition towards a first child between homogamous and inter-faith unions 'challenges the hypothesis that [...] couples concerned perceive their unions to be more fragile' (Adsera 2006c, p. 217). However, the lower fertility of inter-faith couples found in the original fertility regressions (column (3) in Table 3) seems to arise from differences in the transition to the third child (Table 5). As pointed out in the paper (p. 217), this is probably the average result of bargaining within those marriages, even though within-couple differences in values have an ambiguous impact on family size depending on the particular composition of the couple (Lehrer 1996). Neuman notes that only two interactions between spouses' religions are significant in the fertility equation (column (4) in Table 3). In part this is due to the lack of power of the small samples of different types of inter-faith couples. Precisely the rationale for grouping all couples with at least one spouse in the minority groups is to increase the sample size of the group. For most of these cases the other spouse is Catholic (practising or not). Hence the positive coefficient in family size for that group is the result of two forces: (i) a reinforcement of the pronatalist inclination of the couple when both spouses belong to minority churches and (ii) in cases of mixed marriages, the positive effect in the household bargaining of the preference for large families of the minority spouse (Lehrer

1996). Note that in Table 4 the predicted family size is at its largest when both members belong to minority churches.

Conclusion

It is apparent that the differences in family size between the shrinking group of practising Catholics and the rest of society can account for only part of the sharp decrease in the Spanish total fertility from 2.8 in 1975 to 1.2 in recent years. As I noted in the paper the disparity in levels of total fertility across OECD countries during recent decades is related to the different labour-market dynamics and institutions that help to accommodate the trade-offs of work and family in each country (Adsera 2004, 2005). The Spanish labour market, with high unemployment from the mid-1980s and rigid labour-market institutions that favoured traditional full-time employment of men and limited the availability of part-time positions for new mothers, was a particularly harsh environment for working mothers. Those Spanish women who faced high regional unemployment early in their careers were apt to have fewer children than they desired (Adsera 2006a). However, even if recent changes in Spanish total fertility are mainly explained by these latter factors and by tempo effects induced by shifts in the timing of births, the fast secularization of the country also helps to explain the decline.

Notes

- 1 Alicia Adsera is at the Woodrow Wilson School of International and Public Affairs, Princeton University, and is also affiliated with the Department of Economics at the University of Illinois at Chicago, and IZA (Bonn). E-mail: adsera@princeton.edu
- 2 The author would like to thank Evelyn Lehrer, Carles Boix, and an anonymous referee for excellent comments.

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