Reciprocal Effects of Sexual Initiation and Religion in Italy and Poland

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Abstract. The influence of religion on individual life-course in general – and on sexual behavior in particular – has long been recognized by social scientists, nevertheless few studies have explored the reciprocal association between religiosity and sexual debut, mainly in a European overwhelmingly catholic contest. In this article we study the dynamic bi-directional effect between first coital experience and discontinuing church attendance among representative samples of Italian and Polish students. Both effects work, contrasting the results of other authors for USA, where only the effect of religion on sex has been detected. These results do not change if the two processes are considered simultaneously, and unobserved heterogeneity is taken into account. Some possible explanations are discussed.

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1. Introduction

Catholicism shares with the other big « religions of the book » an explicit willingness to regulate sexual, marital and reproductive (SMR) behavior. This is especially seen mainly in articulated and explicit norms which are intended to guide and uniform the behavior of the followers. The most important and well grounded ones concern the exclusivity of sexual intercourse within marriage, the ban of birth control practices not based on abstinence, and the indissolubility of marriage. The individual and the collective relevance of these prescriptions make this normative system, at least formally, reciprocal: on the one hand, such exacting norms strongly direct behavior, on the other hand, such behavior is so recognizable and important in an individual's life to define a clear boundary between who adopts such norms – and follows the Church – and who disregards them, placing oneself outside it.

Yet, the presence of explicit norms is a necessary condition, albeit not a sufficient one, to guarantee a close reciprocity between adhesion to a religion and respect of its prescriptions on SMR behaviors and attitudes. Such reciprocity needs to be perceived both at an individual and collective level, and there need to be institutions which are capable to reinforce it and make followers comply with it (Goldscheider, 1971; McQuillan, 2004). If these conditions are not in place, on the one hand the norms could not influence the actual behavior of the followers, on the other hand, who does not respect them may continue to feel close to the religion, and to be recognized as in communion with the Church.[1]

[1] These aspects have been thoroughly studied in relation to the control of marital fertility. Where there exists a strong institutional and individualizing presence of the Catholic Church, the control on individual behaviour – hence of SMR behaviour as well – was put into place through a system of rewards and sanctions which essentially involved all the institutions with which each individual interacted: from family to neighbours, from the parish to the school, from the clergy to the civilian authorities (such as doctors and midwives). This is what happened for example in Ireland and Quebec in the 19th century and the early 20th century (Ò Grada, 1991; Gervais and Gauvreau, 2003). In such social contexts, religious affiliation contributed to slow fertility decline, whereas the lack of affiliation to the teaching of the Church on SMR behaviour coincided with religious exclusion (and often the partly exclusion from the local community). Yet, the case of Quebec and Ireland is quite a particular one: over there the Catholic Church has been the heart of the national and local identity for centuries for two countries colonized by foreigners affiliated to another religion. Poland could have shared a similar situation, during the Russian domination (finished in 1918, at the end of the first World War), the Nazi occupation (1939-45) and the Communist period (1945-1990): the Polish church inspired and often directly drove the nationalist resistance against the foreigners and the totalitarian state. However, generally speaking, the close reciprocity between adhesion to a religion and respect of its prescriptions on SMR behaviors has been less stringent: the norms have not always been rigorously applied, and who behaved in a different way was not always completely excluded at a religious and social level.

This last situation now characterizes almost everywhere the relation between affiliation to the Catholic Church and adhesion to its moral prescriptions on SMR behavior. More generally – enlarging the specific context of family and sexual ethics – we can talk of "*bricolage* religion" (self-made religion) (Luckmann, 1979; for Italy see Garelli et al., 2003; Trombetta, 2004): the majority of people who maintain a relation with the transcendent, "create" an individual religiosity, accepting or refusing specific beliefs, prescriptions and rituals proposed by one religion (or more). The consistency, in reference to a *corpus* of prescribed norms, is replaced by the desire to satisfy one own's specific need of a relationship with God and/or with the religious institution. This individually defined religion becomes one of the items in the "scale of values" which direct the preferences of the citizens of the post-modern world, even with specific reference to SMR behavior (Hakim, 2003; van de Kaa, 2004). This happens in a strongly secularized context, where the Church has only limited power to "oblige" the individual to conform to its own norms.

Yet, even in such a deconstructed context, the reciprocal influence of religion and SMR behavior and attitudes has not dried up. For some aspects, it seems to have almost vanished. Commenting on the rapid convergence of sexual behavior and contraception of American Catholics towards the average national behavior, Westoff and Jones (1979) talk of "the end of Catholic fertility" (see also Brewster et al., 1998 for US adolescents and Okun, 2000 for Israeli women). For other aspects, the reciprocal tie continues to be strong and articulated, as Thornton et al. (1992) have shown for example for cohabitation and marriage. As a consequence, even in post-modern social contexts which are largely secularized, to better understand some important aspects of SMR behavior and attitudes, its interconnections with religious behavior should be considered.

In this article we will examine if the age at sexual debut and the age at ceasing regular church attendance are interrelated for young Italian and Polish students, by means of data from a international survey collected during 2000-2002. Obviously, this analysis is not exhaustive in terms of the complexity of the possible connections between religiosity and SMR behavior and attitudes in the diverse contexts of the post-modern world. However, it may be useful for almost four reasons**.**

Firstly, we have chosen two fields which have a long tradition of empirical measurement. Therefore, the drastic simplification, due to the use of only these two indicators of religiosity and sexual behavior is compensated by the awareness of having to do with relatively solid measures, easily comparable in time and space. Secondly, we are able to compare Italy and Poland with USA, the only country where this specific topic has been thoroughly studied (Thornton and Camburn, 1989; Hardy and Raffaelli, 2003; Meier, 2003; Rostosky et al., 2003, see part 3). Thirdly, since in Italy and Poland – until recently – an overwhelming majority of people has been baptized, and has received a specific Catholic education and the Holy Sacraments (see following section), our findings on individual behavior can be read in reference to well-determined institutional contexts. Finally, the survey on Sexuality of University Students (SUS) has been constructed with the aim of explaining the early sexual behavior, reconstructing some processes that – theoretically speaking – could be connected with sex. Consequently, for each one of our students, it is possible to contrast the history of sexual debut with the "history" of Mass participation.

2. Religion and sex among Italian and Polish youth

2.1 Religion

The vast majority of young Italians and Polishes who today are 20 years old were christened in the Catholic Church soon after their birth; they received Reconciliation and First Eucharistic at the age of 8-10 years old and Confirmation at 14-15 years old.[2] These moments – particularly the Baptism and the First Eucharistic – have often been an important rite of passage, emphasized by a preliminary religious teaching (for parents as to Baptism), involving gifts and family celebrations. During childhood and pre-adolescence (aged 6-14), most of the 20 years old attended catechism classes, out of school hours.

Most of Italian young people – although they attended public schools – accepted to have Catholic classes at secondary school as well (about one hour a week). These classes are held by teachers directly chosen by the Church (see table 1, indicator [1]). If one chooses to not attend the religion class, one has one hour less of schooling a week and this hasn't any particular consequence on the student's school assessment. Consequently, it is a matter of choice rather than a constriction. In 2000 as well the sharp majority of first marriages was celebrated according to the rite in accordance with the Catholic concordat, ratified by a specific agreement between the Italian State and the Catholic Church in 1929, and renewed in 1984. The bride and the groom pronounce their oaths in front of a priest during the wedding Mass, in which they usually receive the Holy Communion as well. In Italy the "agreed rite" has also a civil value. This means that the rite has not to be repeated in front of a State official, as in other mainly Catholic countries, e.g., in France (see table 1, indicator [2]). The religious education of the youth – one of the greatest pastoral efforts of the Italian Catholic Church in the last decades – shows clear signs of strain in the last few years. As the previous two indicators show, even if the vast majority of young Catholics is still involved in the initiation of the sacraments and in catechism, a slow erosion can be observed, which is becoming much more marked especially in the larger cities in the North and in the regions where during the second half of the 20th Century there prevailed the sub-culture of left-wing political parties, under the direction of the Communist Party (i.e., Emilia-Romagna, Toscana, and Umbria) – Cesareo et al., 1995.

Not withstanding this changes, in Italy one can still speak of mass religious socialization during childhood and pre-adolescence. Yet, what are the outcomes of the commitment of the Church? The popular choice of a religious marriage seems to point out to a very common persistence of attitudes and behavior which are close to religion. Yet, in many cases this choice seems to be more a tribute to tradition, to habits and to parents' desire, rather than a conscious consequence of clear-cut religious choices. Indeed, other indicators show that most young people become detached from Church and religion during adolescence (see table 1a, indicators [3]-[6]), although the proportion of self-declared

[2] The relationship with religion of young foreigners living in Italy – which nowadays are quite a few especially in the Centre and the North – is obviously very different and strongly determined by the tradition of their own country. According to estimates of 2002, 24% are Catholic immigrants, 21% Christian (mostly Orthodox), 37% Muslims, 18% of other religions or without religion (Caritas Italiana, 2003). In Poland, immigrants are not numerous enough to draw on the homogeneity of Catholic affiliation among young people (see, e.g., www.state.gov/g/drl/rls/irf/2003/24427.htm).

religious young people is much higher than elsewhere in Western Europe (see notes under table 1a). Moreover, it is wrong to think of a progressive and relentless decline. Indicators show that this position hasn't ripened over the past years, but that it was already determined at the beginning of the 1980s (thus for young people who were born at the end of the 1950s). Previous surveys show that the detachment of young Italian people from religious practice has to be dated back to the 1960s and the early 1970s (Cesareo et al., 1995, 73-79). On the contrary, the past 30 years are characterized by a steady approach.

The data available for Poland are less rich, referring only to Mass participation. Nevertheless, they clearly confirm the idea of an involvement of the Polish youth in the Catholicism stronger than elsewhere in industrialized countries (table 1b). At the end of 2000, 60% of young Polish women and 49% of young Polish men attended Mass every week. Polish people aged 18-24 going Mass at least once a month were around 70%, doubling-up the proportion of Italy (33%, table 1a). However, also in Poland at age 20 the Mass participation is less frequent than in the beginning of the adolescence (see table 4b for university students). After this decline, the Mass participation of adult does not change with age, if the cross data of table 1b are extensible to cohorts. It may be, as the Mass participation in Poland is practically constant from 1986 to 2000 (CBOS, 2001). The most important differences are between urban and rural areas, showing the Poland shares a "classical rule" of the secularization process (Ornacka and Szczepaniak-Wiech, 2005): the bigger the city, the lower the religious involvement. However, also in the urban areas of 500 thousand or more (in Poland: Warsaw, Krakow and Wroclaw in 2001), more than 50% of young people go Mass once a month or more. This proportion is higher for students, as is the most of Western countries (Miller and More, 1990).

In conclusion, during the period 1970-2000 the relationship of young people with the Church is stable in Italy, taking on the following two features: (1) religious socialization and the mass initiation to the sacraments during childhood and pre-adolescence; (2) progressive detachment of young people from religious practice during adolescence and youth. Data for Poland – albeit less detailed – suggest that the same two processes work, although the lack of involvement from Church during adolescence is less marked. The proportion of people around 20 going Mass at least once a month is double in Poland than in Italy (70% vs. 33%).

TABLES 1A AND 1B

2.2 Sex

For the Italian cohorts born in the first half of 20th century, the sexual initiation occurred in a double standard system which even more marked if compared to central and northern European countries (Castiglioni and Dalla Zuanna, 1995; Bozon and Kontula, 1998; Bozon, 2003; Castiglioni, 2004). For men, the median age at first intercourse was around 18-19, and "the first time" was generally experienced outside a couple relationship, often with older women or with prostitutes – Italy was on of the last European countries to ban public brothels in 1958. On the other hand, the majority of women had their first intercourse at marriage or with their husband-to-be just before marriage at an average age of 21-22. Among the married women born in the 1940s, more than half were virgins at marriage.

In Italy, something has started to change with the cohorts born in 1950s. For men the age at intercourse is almost unchanged. What has changed is the context of the sexual initiation, which generally takes place either within a steady couple relationship or in an occasional encounter with girls of the same age. For women the age at intercourse is now equal to that of men in the Centre and North, while in the South women on average have intercourse one year older than men.

For the first cohorts (born in 1950s) the sexual revolution took place at the same time of the decrease of the average age at marriage, which in Italy reaches the minimum level of 22.5 for the women cohort born in 1951-1955 (De Sandre et al., 2000, p. 26). As to the cohorts born later, the age at marriage increases rapidly and goes up to over 27 years old for women born in the middle of 1970s. Unlike North and Central Europe and like other Mediterranean countries, in Italy this sudden increase of age at marriage is not matched by a diffusion of cohabitation or house-sharing with friends or living on one's own.[3] On the contrary, many unmarried Italians continue to live with their parents beyond their 30s. As a consequence, Italians born in the early 1970s have experienced a long and sexually active period (10-12 years for men, 8-10 years for women) while living with their parents and with the necessity of avoiding pregnancies. It is not a surprise that their contraceptive practices are very high (75% of them used some contraceptive method at first intercourse, against 33% of the cohort born twenty years earlier – De Sandre et al., 2000, p. 108), and their frequency of sexual intercourse has been restrained (Castiglioni et al., 2001).

In Poland the sexual revolution took place after fall of Communism at the beginning of the 1990s. Data from the 1991 FFS survey show small changes in sexual behavior of the generations born before 1970. The percentage of young people born in years 1947-51who have already had their first intercourse under 18 was 19% for males and 17% for females, and not very different for younger cohorts. For birth cohorts 1952-1956, 1957-1961 and 1962-1966 the median age at first intercourse remained unchanged at 20.8 years for males and 20.6 years for females. For the individuals born in 1967-1971, that become teenagers in the 1980s, the first changes happened, as the median age dropped at 19.7 for males and 19.6 for females (Wróblewska, forthcoming).

It was with the great social and cultural changes of the 1990s that the sexual habits of Polish teenagers significantly changed toward a liberalization of sexual attitudes. A nation-wide survey of secondary school students carried out in 1996 revealed that sexual experience of 17-year-olds is comparable to 19-year-olds in the generation of their parents (Wróblewska, 1998). These figures are similar for the birth cohort 1972-1976, interviewed in the Polish Retrospective Survey 2001 (Frątczak, 2002). For this cohort the median age at first sexual intercourse was 19 for both sexes, 1.5 years lower than the one for persons born 10 years earlier.

In conclusion, sexual revolution took place in Italy as well but with its own features which are different from other countries, though similar to Spain for example, as the outcomes of a national research show (INE, 2004) or Portugal. The sexual behavior of

[3] In fact, cohabitation among young people is spreading in Italy as well, and this trend may continue in the following years as well (Rosina, 2004). Yet, even those who choose cohabitation leave the parental home at an older age if compared to the countries of Central and Northern Europe: in Italy we can speak of cohabitation of young adults rather than cohabitation of young people.

young Italians born in the 1970s and early 1980s can be summed up with three adjectives: belated, moderate and cautious. *Belated* because 18-19 years old is a higher age for first intercourse than that observed in other European countries, not to speak of the United States and other overseas Anglo-Saxon countries. *Moderate* because of the low frequency of intercourse caused by the fact that the partners do not live together. *Cautious*, because of a strong contraceptive cover. A positive outcome of this behavior is that there are few young Italian single mothers, and teen's pregnancy rates are among the lowest in developed countries.

The features of the sexual revolution are also quite different in Poland, but comparable to the changes that happened in all Eastern European countries after 1989 (see e.g. Denissenko et al., 1999). The great changes in the sexual behavior of young people started in the 1990s, and had a remarkable acceleration in the early 2000s, as the Western cultural model become more widespread among younger generations, slowed only in part by the strong role of the Catholic Church. The present sexual behavior of Polish young people can be compared to that of Italian ones, for the low prevalence of cohabitation, that reduces the frequency of intercourse (Wróblewska, forthcoming), and for the widespread use of contraception at first intercourse: 87% girls and 80% boys used a contraceptive methods (Frątczak, 2002).

2.3 Religion and sexual behavior and attitudes

In Italy and Poland, as elsewhere, religiosity and sexuality are strongly linked. This association – already quite intense in the years preceding the sexual revolution (for Italy: Fabris and Davis, 1978)[4] – emerges for the younger cohorts as well.

For Italy, the greater number of statistical valid analyses on national samples referred to the connections between Sunday Mass attendance and age at first intercourse (Ongaro, 2001; Cazzola, 1999; Castiglioni, 2004). Some of the results of a study on this topic can be found in table 2. For young Italians born in 1966-1977 and interviewed in 1996, Sunday Mass attendance is the variable which is particularly associated with the statistical risk of engaging in first sexual intercourse. Among girls, the median age at first intercourse ranges from 18.6 among those never going to Mass to 21.4 among those going to Mass at least once a week. Among boys of the same two groups, the median age ranges from 17.9 to 21.2. Generally, the authors of the studies we have here referred to explain these results as a sign of the effect of religiosity on sexual behavior. Yet, up to now in Italy it has never been possible to thoroughly study the direction of this relation. In the survey on sexual behavior, Mass attendance was asked in reference to the time at interview. Quoting Castiglioni (2004, p. 29): "Religious youth delay their entry into sexual life, behaving consistently with the Church's teaching. However, an inverse mechanism could be also operating. A precocious sexual activity could increase the distance from the Church's moral norms, which could later lead them away from religious practice".

[4] As far as we know, the survey by Fabris and Davis – carried out in early 1977 – is the only extensive study on a statistical representative sample of the Italian population. The authors propose several tables in which religiosity is crossed with diverse aspects of sexuality. Although, lacking more complex statistical models, it is not possible to control for the spurious relations, the association of the two variables is almost always strong for both young and adults, for sexual behaviour both within and outside marital life.

The association between sexuality and religion among Italian youth is also studied for other sexual aspects and, more generally for SMR behavior and attitudes. Results are very similar to those described in the introduction: for some aspects the Catholics are strongly characterized, whereas for other aspects differences are considerably minor. The differences between Catholics and young people without religion are also closely related to some SMR attitudes. All the hypothetical behavior listed in table 3 is condemned by the Catholic ethic. Nevertheless, the proportion of Catholics refusing them changes deeply (from 31% for cohabitation to 68% for abortion), and the same happens for differences between Catholics and people far from any religion, although the differences between the two groups are always statistical significant.

Even if, as far as we know, the association between sexuality and religion was never studied for Poland by means of quantitative methods, we suppose that similar conclusions can be drawn, with the young Catholic in Poland strongly characterized for some aspects, especially those related to SMR behavior, perhaps more than Italy, as it resulted for non-marital sex and for sexual experiences before age 16 (Widmer et al., 2001).

TABLES 2 AND 3

3. Conceptual framework and modeling approach

Our main aim is to study the reciprocal influence between sexuality and religion among young Italian and Polish students. In particular we focus on the sexual debut and on discontinuing Mass attendance. These events are the outcome of processes which interact dynamically with each others. "Without correctly specifying the causal influence in both directions, empirical estimates of the impact of religion on adolescent sexuality will be biased" (Thornton and Camburn 1989, pg. 641). Nevertheless, often the two processes are in fact separately analyzed, or cross-sectional data are used that do not allow a separation of the reciprocal effect (Rostosky et al., 2004). "There are very few studies that have explored possible reciprocal relationships between religiosity and first sex" (Meier, 2003, pg. 2). As a consequence, "our empirical understanding of the association between religiosity and adolescent sexual behavior is fairly limited" (Hardy and Raffaelli, 2003, pg. 732).

From a methodological point of view we analyze retrospective longitudinal data with event history models that explicitly account for the endogeneity of one event as a predictor of the other by taking into account both heterogeneity across individuals due to unobserved factors that may affect each of the two processes and the correlation in the unobserved factors across processes (Lillard and Waite, 1993; Lillard et al. 1995). The timing of the events (first sexual intercourse and discontinuing church attendance) is expressed in terms of the life of the individual, starting from 13 years old. Besides, we take explicitly into account the selection due to the fact that we confine the analysis to the sub-sample of those who at the beginning of the process (13 years old) used to attend Mass and were virgins. Since, basically all the individuals analyzed (some rare cases excepted) were virgins at 13, the selection mechanism is relevant only for religious participation.

From a substantial point of view, the hypotheses we want to verify are the following. Several studies have highlighted the importance of religiosity on sexual

behavior. The results obtained in the literature essentially agree that church attendance reduce the likelihood of coital debut and it is also positively associated with greater perception of risk of contracting HIV or pregnancy from unprotected intercourse (Miller and Gur, 2002). The Roman Catholic Church reinforces values which discourage the youth from engaging in precocious, or anyhow premarital, sexual intercourse. The adhesion to such values proves to be particularly strong among the youths frequently attending religious events: they "receive frequent religious messages concerning premarital sex, and their religious involvement may facilitate their acceptance of the teaching of their religious institutions". Thus they are "more likely than others to develop sexual attitudes and behavior that are consistent with religious teachings" (Thornton and Camburn, 1989; p. 642). Our first hypothesis is therefore the following:

H1: "Religious effect": net of common factors (observed or unobserved) discontinuing Mass attendance has a positive effect on the risk of experimenting the first sexual experience.

Many scholars suggest that beside the effect of religion on sexual behavior, there might also be a reciprocal influence between sexual behavior and religiosity (Thornton and Camburn, 1989; Benda and Corwyn, 1997; Rostosky et al., 2004). Results in this direction are however controversial, and in particular are not statistically significant for the US youths (Meier, 2003; Hardy and Raffaelli, 2003). However – from a theoretical point of view – for young religious people the fact of having experimented premarital sex is likely to produce a cognitive dissonance (Festinger, 1962) with the religious values that oppose such behavior. The solution to such inconsistency between behavior and values can be of two kinds. Firstly, the youth, especially if the sexual experience was positive and satisfying, could distance him/herself from religion (*religiosity adaptation*):[5] "the discrepancy between the individual's own position of the church will alter the individual's relationship with the religious institution. The authority of the Church may be questioned, the commitment to the institution weakened, and the involvement in church services restricted" (Thornton, and Camburn, 1989, p. 643). Conversely, in a context characterized by more moralistic and conservative beliefs about sex, the coital debut, especially if emotionally unsatisfying, could be followed by a sense of guilt that temporally leads to freeze the sexual experience and to reinforce the religious involvement: "a sexuality experienced religious teen can reduce cognitive dissonance […] by ceasing to engage in sexual activity" (Hardy and Raffaelli 2003, p. 732). In the literature the effect that is considered to be prevalent is the first one (*adaption effect*). We therefore have the following hypothesis.

H2: "Adaptation effect": net of common factors either observed or unobserved, sexual debut has a positive effect on discontinuing Mass attendance.

The strength of the relationship between sex and religion can be gender differentiated (Meier, 2003; Rostosky et al., 2003). Even the observed or unobserved control factors can have a differentiated impact on gender (for Italy see, for example,

[5] "Meaning that the behaviour causes the individual to change his or her religiosity" (Meier 2003).

Castiglioni, 2004). This suggests that separated analyses should be carried out for males and females.

The control variables explicitly included in the model capture the influence of the geographical context in which the youth lives and of the cultural and religious orientation of the parents. Parental values are important determinants of young adults' behavior (Thornton and Camburn, 1987; Miller and More, 1990; Thornton and Camburn, 1989), and this is true also in Italy (Rosina and Fraboni, 2004). Moreover, studies on sexual behavior have shown that the Southern regions of Italy are more traditional than those of the North (Rosina and Rivellini, 2004), whereas in Poland the territorial heterogeneity may be better controlled distinguishing between Rural, Industrial, Modern and Other (residual) districts (see par. 4.1). Lastly, since the relation between first sexual experience and religion can be affected in a substantial way by the fact of living in a couple relationship, we also consider if the youth is involved in a relationship as a control variable.

Also the presence of unobserved factors that could influence both processes must be taken into account. Some of these unobserved factors could influence both domains simultaneously and generate a potential spurious correlation. To correctly estimate the bi-directional causal effects it is therefore important to allow for the correlation among the unobserved heterogeneity term of each process (Lillard, 1993; Coppola, 2004). Such heterogeneity represents the unobserved factors that affect the individual choices, mainly attitudes and values. From a theoretical point of view, correlation between unobserved heterogeneities of the two processes could be either positive or negative. It is positive in the case that in the unobserved heterogeneity there prevails factors that in a concomitant way act by increasing (diminishing) the risk of both first sexual intercourse and Mass discontinuance. A factor of this kind could be, for example, the degree of autonomy and freedom, personal values being equal, transmitted by the parents to the adolescent child. The degree of cultural opening up towards the choices of the children, even though these are not agreed upon by the parents, is in fact only partly explicitly kept under control through the educational level of the parents. There also could be a negative correlation. This could happen in the case in the unobserved heterogeneity there prevails factors which favor a conciliation between sexual experience and religious participation. For example, the Catholic religion could be experienced without giving much importance to the prescriptive aspects, and valuing more instead the positive message of love, trust and openness towards others. Having an affective couple relationship with a partner who shares this same idea of religion could favor a positive interaction between religion and sexuality within a couple.

As in the unobserved heterogeneity all these factors could be merged, we cannot state a priori *the sign of correlation among the common latent factors of the two processes*

4. Data and methods

4.1 Data

Our data were collected by an international comparative survey on the sentimental and sexual life of university students in several countries (Italy, France, Poland, Bulgaria, Romania, Russia, USA, Australia, Japan). In Italy and Poland, the faculties of Economics (and Statistics in Italy) have been stratified, in order to represent the different social-economic situations of the students (for Italy: Dalla Zuanna and Crisafulli, 2004a; for Poland: Wróblewska, forthcoming). For each stratum, one or more universities have been sampled, and all the students of years 1-2 (in Italy) and 1-4 (in Poland, where people go to the university one year before) being in the classroom in a "normal" lesson day were interviewed. In Italy, about 5,000 students were interviewed, involving 23 universities; the 1,600 Polish students belonged to four universities (Warsaw, Krakow, Wroclaw, and Koszalin). Although in Poland the sampled universities are less numerous than in Italy, and consequently the Polish sample is less satisfactory, the sample method is the same: the two-steps cluster sampling technique, with a preliminary stratification of the units at first step. The random process works only in the first step (i.e., the choice of universities), as all the second step units (i.e., the students sitting in the classroom at the day of the survey) are interviewed. This technique is frequently used for collecting data in the schools, because it is very cheap. The implicit assumptions are: (1) most of total variability is within students of the same classes; (2) the stratification effectively controls the variability between schools or universities; (3) students sitting in the classrooms are not different from students who are not present. If these assumptions work, the efficiency of estimations obtained by our sample is better than the one obtained with a simple random sample of the same dimension. The third assumption is not a problem, as in both Italy and Poland a high proportion of Economics and Statistics students frequent the lessons of the courses chosen for submitting questionnaires (mathematics, statistics or economics). Assumptions (1) and (2) cannot be directly verified, as data on answer-variables (sex and religion) are obviously not known for all the population. However, universities have been stratified looking at geography in both Italy and Poland, and this variable is strongly related to sex debut and Mass participation. In both countries the stratification variable is inserted in the regression models as an explanatory variable (geographical area of residence in Italy, characterized by a very few geographical mobility of students; Warsaw vs. the other three universities in Poland, distinguishing also between the type of the district of residence of students, see table 5a and 5b), in order to better control the effect of the stratification on the statistical association between the answer-variables and all the other explanatory variables.

The questionnaire was the same for each countries, with very few differences. It was originally written in English, and it was subsequently translated from English into the other national languages by professional translators, and carefully checked by the responsible parties of the survey in each country. It is composed of about 200 close questions and takes around 30 minutes to complete. It collects information on respondents' personal and parental background, quality of the relationship with their parents, religiosity (including church attendance of both students and their parents), risky behavior, friendship

network, first sexual intercourse, romantic relationships, and living arrangements, Most information refers to different stages of adolescence (ages 11-13, 14-15, 16-18).

The questionnaires were filled in during a one-hour lesson, under the discreet surveillance of both the professor of the course and a researcher, who presented the survey and was ready to answer questions, if there were any. Lastly, the questionnaires were sealed in an envelope and recollected. This practically resulted in a non existent refusal to fill in the questionnaire in class. It is a significant improvement comparing to at least 20-30% of refusals in face-to-face or CATI interviews (see, e.g., Bajos and Spira, 1993).

The sample sizes are about 5,000 (Italy) and 1,600 (Poland). It is a significant improvement if compared to previous studies on sexual life in both countries, which usually were made on smaller samples, and were also not frequent. The respondents are mostly unmarried (99%) males (40%) and females (60%), born between 1975 and 1982, and aged between 18 and 26 years at interview (the median age is about 20.5 in both countries; in Italy 77% and in Poland 78% of interviewed people were 19-21 years old).

The main problem of self-filled questionnaires is the high unit non response rate. For each question of SUS survey, non responses were always lower than 10%. The month at first intercourse (15% of missing data in the Italian sample, 10% in the Polish one) and at first steady relationship (respectively 24% and 6% of missing data) are an exception, probably because they were more difficult to recall. They were replaced according to the distribution of known values. We further excluded the questionnaires where it was impossible to determine when they stopped attending church, or if they ever went to Mass. Thus our samples were finally reduced to 4,058 and 1,551. The reduction was significant for the Italian sample, but not in the Polish one. The 950 people in the Italian sample excluded from the analysis because of these non response problems were sexually more precocious: the median age at first intercourse of the here analysed 4,058 people is 19.5 for both males and females, whereas it is 18.9 for males and 19.2 for females if all people are taken into account, without excluding people who did not fill correctly the answers on Mass frequency. Consequently, the "sexual delay" of the here analysed group is more accentuated, mainly for males. Moreover, as they answered questions on Mass frequency, they may be more interested to religious issues.

Apart from these selection problems, students have some important advantages: a high number of interviewees, an above than average cultural level (an appreciable characteristic for a self-filling, although not complex, questionnaire), and a low number of refusals. However, university students of Economics and Statistics (faculties not considered as the easiest in terms of commitment) are a particular group: they invest many personal and family resources in education, are subject to greater expectations from their family, and thus they usually delay the formation of their own family.

There is a long tradition of studies about the sexual life of students (see e.g. Reinisch et al., 1992; Sprecher and Regan, 1996; Murray et al., 1998; Denissenko et al., 1999; Whitbeck et al. 1999). Generally, students delay sex more than early workers (see Miller and More, 1989) and the age at first intercourse is negatively related with education (Bozon and Leridon, 1995; Johnson et al. 1994; Laumann et al., 1994,) particularly if – during their life as students – live in the parental family (Castiglioni, 2004 and Rivellini and Rosina, 2004 for some results on Italy). Nevertheless, sexual behavior and Mass attendance of our sample are not particularly out of the Italian and Polish rules. For the

Italian sample the median age at first intercourse is around 19.5, and students attending Mass at least two times a month at their 19th birthday (around the beginning of the first year at university in Italy) are 25% for males and 40% for females (table 4a). Moreover, their church attendance has speedily declined during their teens, as the proportion going to Mass at least two times a month when they were 13 were 70% for males and 83% for females. For the Polish sample the median age at first intercourse is around 19.9, and students attending Mass at least two times a month at their 19th birthday (around the beginning of the first year at university also in Poland) are 52% for males and 68% for females (table 4b). Moreover, their church attendance has declined during their teens, even if not as fast as in Italy: the proportion going Mass at least two times a month when they were 13 were 85% for males and 88% for females. Therefore, although these students are not representative of the youth as a whole, the direction of selection is well known, and the timing of their sexual initiation and discontinuing church attendance are not far from that of the average common youth.

TABLES 4a AND 4b

4.2 Variables

Here is the list of the variables used in our analysis (see their distributions in table 5).

Experienced first steady relationship (time varying). Students were asked*: Have you ever had a steady relationship? When did this begin?* The possible answers were: month and year, or never happened.

Experienced first sexual encounter (time varying). Students were asked*: Have you ever had sexual intercourse? When did this happen for the first time?* The possible answers were: month and year, or never happened.

Mass attendance at 13 years old. Students were asked: *Apart from such special occasions as weddings, funerals and baptism, how often did you attend services connected with your religion when you were 13 years old?* We grouped the answers in two subgroups: irregularly attending Mass (at least about once a month), and regularly attending Mass (at least 2-3 times a month). In our opinion, students could easily answer this question as generally the 13th year of age is a "crossing year", dividing pre-adolescence from adolescence. Most of Catholic young people receive the sacrament of Confirmation – after some months of specific religious education – during the 13th year of age.

Age at stopping Mass attendance. Students were asked: *How old were you when you stopped going regularly to functions of your religion?* There were three possible answers: age (in years); I never went to religious services regularly; I still go to religious services or other functions regularly. Although discontinuing Mass attendance could be a process, rather than a single event, the bet of this article is that the age declared by each student is not far from the "average age" of his/her effective dismissal of the religious habits of his/her pre-adolescence period. As table 4 shows, for many students this age is not far from the time of the interview, and this narrow time period could suggest that the student may remember the timing of the event.

Mass attendance (time varying). We created this time varying variable by putting together the information from three variables: a) Mass attendance at 13 years old, b) Mass attendance at the interview (the possible answers were the same as for age 13), c) age at stopping Mass attendance. We created three subgroups: never attending Mass (never or sometimes during the year), irregularly attending Mass (at least about once a month), regularly attending Mass (from two or three times a month to once a week or more).

Father's and mother's Mass attendance when the student was 13 years old. Students were asked: *Apart from such special occasions as weddings, funerals and baptism, how often did your father and mother attend services connected with their religion when you were 13 years old?* Again we divided the answers into three subgroups: never attending Mass (never or sometimes during the year), irregularly attending Mass (at least about once a month), regularly attending Mass (from two or three times a month to once a week or more).

Parents' education. Students were asked: *What was the highest level of school your mother and father finished?* We created four subgroups: a) lower education (high school not completed or lower) of both mother and father; b) lower education of father and higher education of mother; c) higher education of father and lower education of mother; d) higher education for both parents.

Geographical area of residence. For Italy we grouped the 103 provinces in two macro-areas: North Centre, and South. For Poland we grouped the 49 districts in four categories: Rural, Industrial, Modern and Other (residual) districts, according to the classification operated by Podogrodzka (2002), following the criteria elaborated by Kwiatkowski et al. (1992) and Kwiatkowski and Gawrońska (1995) based on the percentage of workers in Agriculture and Forestry, Industry and Construction, and in Private Sectors.

University attended (only for Poland). We added this control variable to compare students attending Warsaw University with those attending university courses in the other three cities.

TABLES 5A AND 5b

4.3 Statistical methods

We study the association between the onset of first sexual encounter and religiosity, considering four groups of people separately (Italian and Polish males and females). Specifically, we study the net effect of DMA on FSI and, conversely, the net effect of FSI on DMA. We select as the target population youths who at 13 attended Mass at least once a month (about 72% of the total sample for Italy and 88% for Poland). In a first stage, we have analyzed separately the two processes (FSI and DMA), without taking into account unobserved heterogeneity and correlation between the parallel processes. They are two separate event history analyses, where one process is used as an explanatory time-varying variable of the other.

In the Appendix, we illustrate some further stages where we estimated models that are statistically more sophisticated and complex. In these models, as already stated in detail in section 3, we control for unobserved factors, allowing the casual effects of the two regression equations to be correlated, and a selection equation is included, in order to

control for selectivity in both processes (some people did not frequent Mass at least one a month when they were 13 years old). Apart from the refinement of the models, the statistical associations between DMA and FSI processes work in the same direction. Consequently, in the following section we prefer to comment the regression coefficients connecting FSI and DMA of the simple event history models, that are less affected by random variations of the estimates of coefficients (Aasve et al., 2003). The complete results are shown in the Appendix.

5. Results and discussion

In both countries and genders, we find a positive and significant effect of the time-varying covariate DMA on the FSI process, and a positive and significant effect of the time-varying covariate FSI on the DMA process (table 6). These results are consistent with the H1 ("religious effect") and H2 ("adaptation effect") hypotheses (see part 3). The effects are more intense for Italian and Polish females and in Poland, except for FSI→DMA that is a bit stronger for Italian males. As stated above, these results do not change when models are more "complicated", controlling for unobserved heterogeneity, considering the correlation between the two processes and taking into consideration the possible selection mechanism (see tables 8 and 9 in the Appendix).

The intensity of statistical association is similar for Italian males and females, and for Polish males, whereas it is stronger for Polish females. This last result my be due to the lower proportion of Polish girl who stop the regular Mass frequency (68% of them go Mass at least two time a month when they are 20 years old, versus 88% when they were 13). The Polish girls who leave a constant religious practice during their adolescence are a minority, and they could be more selected in order to speedy change their sexual behavior.

TABLE 6

Just above 55% of the Italian and Polish 20 year old university students in our samples declared to have had sexual intercourse (see again tables 4a and 4b). The chances of experiencing this event is conditioned by the students' religious behavior: who attend church remains a virgin for a longer time. This result is very similar to what has been found in many other studies on this topic. Yet, for Italy and Poland, up to now it has never been possible to identify the direction of the causal effect. Moreover, the effect persist when in our models we account for unobserved common factors, providing empirical evidence to the hypothesis of a "genuine" (not spurious) effect of Mass discontinuity on sexual debut.

32% of the Italian and 65% of Polish university students in our sample attend Mass at least two times a month. This proportion, although high (in Italy) and extraordinary high (in Poland) in comparison to other industrialized countries, is however lower than what it was at 13 – as retrospectively declared by the interviewees. The process of religious estrangement is interrelated with the onset of adult affective life. For both boys and girls, the first couple experience and – especially – first sexual intercourse, accelerates the detachment from religious practice. This result – common to all our models, and stronger if we consider the possible correlation between the processes, due to unobserved common

factors – does not confirm what was obtained for the USA (see, e.g., Meier, 2003): young Americans do not significantly change their religious practice after having experienced their first sexual intercourse.[6]

In our opinion, this difference between Italy and Poland, and the USA is one of the most interesting result of this study. To explain what this actually means, it could be useful to refer back to the first part of this article. Sexual, marital and reproductive behavior not in line with the ethical norms of a religion can affect the closeness and the feeling to the same religion if the incompatibility is felt at an individual and collective level, and if there are institutions reinforcing them and making their followers comply with them.

In today's Italy and Poland it is hard to believe that a priest can deny the Holy Communion or access to an event organized by the Church to youth who are "suspected" of having engaged in premarital sex. However in Italy and Poland the Church keeps a strong ability to involve adolescents. Moreover, the Italian and Polish mass media echoes more than in other countries the word of the Catholic hierarchy, especially the Pope, where the traditional norms are vigorously reinforced, leaving little room to the individual interpretation. Moreover, in Italy and Poland, unlike in USA, the Catholic Church is present everywhere, and the "conflict" with other religions and Churches is practically not present. Therefore, for a young Catholic it is difficult to being exposed to religious opinions which are not those proposed by the Catholic Church and she/he is more unlikely to be involved in a love story with a person belonging to another religion. In this context of religious monoculture, it could be that many young people clearly perceive the incompatibility between sexual intercourse and Catholic affiliation. As a consequence, for many of them first sexual intercourse might accelerate the voluntary detachment from the Catholic Church.

Finally, we would like to better define the "boundaries" of our results. We have shown a reciprocal interaction between the two processes of the onset of adult sexuality and estrangement from a regular religious practice. However, in Italy as in Poland, the large majority of practicing young Catholics – even with a delayed first sexual intercourse – do not arrive at marriage as virgins. As shown in table 3 for Italy, only 33% of young Italian Catholics going to Church at least once a month interviewed in 2000 stated that it is not admissible to have sexual intercourse before marriage. This idea of reciprocal compatibility between sex and religion is confirmed also by our samples (tables 7): both in Italy and Poland many students regularly go Mass although they already experienced sexual intercourse, and many not virgin people go regularly Mass. Among churchgoer students, not virgin people are 36% (Italian males), 39% (Italian females), 57% (Polish males), and 39% (Polish females), and among not virgin students the churchgoers are 23% (Italian males), 30% (Italian females), 54% (Polish males) and 64% (Polish females). It is difficult to suppose that all the not virgin churchgoers go Mass because of social pressure, as they do not live in remote villages, and in Poland they mainly live far from their family.

[6] It is not easy to say if the result here discussed is applicable to the whole population as well or if it is specific to these students only. On one side, the students could have a more "rational" approach, less inclined to accept a conflict between doctrine and behaviour. On the other side, the students could be culturally more equipped to create their own "individual religion", giving at the same time – in their conscience – full adhesion to the Church and engaging in premarital sexual intercourse.

Consequently, the *bricolage* religion (or better, the *bricolage* sexual ethic) is an important component of the approach to sexuality also for the Catholic students of Italy and Poland. Moreover, this extensive reciprocal coexistence between affiliation to Catholic religion and sexual experiences condemned by Catholic religious ethic is also a signal of the relative flexibility of Catholicism, confirming results of other recent comparative studies (McNamara Barry and Nelson, 2005).

TABLE 7 HERE

Appendix

A more complex model…

We use an event history approach with simultaneous hazard rate equations. To take into account the individual heterogeneity we include in each process the appropriate casual effects. To control for the unobserved factors that can concomitantly act on both the processes we allow the casual effects of the two regression equations to be correlated (Lillard et al., 1995; Baizan et al., 2003; Coppola, 2004). To control for selectivity in both processes we included in our model a selection equation.

The statistical specification of the model applied in this analysis is derived from the framework developed by Lillard (1993). It consists of two simultaneous hazard rate equations, modeling time (from age 13) to First Sexual Intercourse (FSI) and to Discontinuing Mass Attendance (DMA), both estimated only on young people who still go to Mass at 13 at least once a month. We added a selection equation (Heckman, 1979), to take into account selectivity introduced in the model when including only these individuals. This is necessary, because, as already stated in the previous section, respondents who are religious at 13 can be a non-random subset of population.
The model is the following:

$$\begin{cases} \ln h_i^{FSI}(t) = y_i^{FSI}(t) + \sum_j a_j x_{ij} + \sum_k \alpha_k w_{ik}(t) + \delta \\ \ln h_i^{DMA}(t) = y_i^{DMA}(t) + \sum_j b_j x_{ij} + \sum_k \beta_k w_{ik}(t) + \varepsilon \\ z^* = \sum_j c_j x_{ij} + \theta, \qquad \begin{cases} z = 0 \text{ if } z^* \leq 0; \\ z = 1 \text{ if } z^* > 0; \end{cases} \end{cases}$$

with $\ln h_i^{DMA}(t)$ observed if and only if $z = 1$.

$$\begin{pmatrix}\delta\\ \varepsilon\\ \theta\end{pmatrix} \sim N\left(\begin{pmatrix}0\\ 0\\ 0\end{pmatrix},\begin{pmatrix}\sigma_\delta^2 & \rho_{\delta\varepsilon} & \rho_{\delta\theta}\\ \rho_{\delta\varepsilon} & \sigma_\varepsilon^2 & \rho_{\varepsilon\theta}\\ \rho_{\delta\theta} & \rho_{\varepsilon\theta} & \sigma_\theta^2\end{pmatrix}\right)$$

If all selection operates through observed covariates, the two equations can be estimated only by using data about individuals who still go to Mass at 13. However, if there is correlation between δ, ε and θ, estimation made using only this sub-sample produces biased coefficient estimates due to a possible self selection mechanism.

Each *y(t)* denotes a piecewise linear Gompertz that captures the effect of the time on the risk. Piecewise linear Gompertz functions are used to approximate continuous functions, and are composed by functions that are linear within each interval. These linear functions are connected at knots given a priori: piecewise linear Gompertz functions are then also continuous functions. This kind of baseline allows for a variety of patterns of the duration dependence in the hazard function. (Lillard and Waite, 1993; Baizan et al., 2003). In this analysis the knots are placed at ages: 13, 15, 17, 19, and 25.

The $\{x_{ij}\}$ denotes time constant covariates. The $\{w_{ik}(\cdot)\}$ are time varying covariates.

The random variables δ, ε, and θ capture the unobserved heterogeneity, and are assumed to have a joint trivariate normal distribution (ρ_{hk} is the correlation between the unobserved heterogeneity terms of the equations). The selection equation is a probit equation which requires that its unobserved heterogeneity component θ has predetermined unit variance.

The model estimation was performed using full-information maximum likelihood, as implemented in the package aML 1.04 (Lillard and Panis, 2000). The t-statistics are based on the BHHH procedure (Berndt et al., 1974).

…and its results

In a first step (model 1 in tables 6 and 7) we have performed two separate analysis of the two processes (first sexual intercourse, FSI, and discontinuity Mass attendance, DMA), without taking into account the unobserved heterogeneity and the correlation between the parallel processes. In both countries, we find a positive and significant effect of the time-varying covariate DMA on the FSI process, and a positive and significant effect of the time-varying covariate FSI on the DMA process in both countries. These results are consistent with the H1 ("religious effect") and H2 ("adaptation effect") hypotheses.

Subsequently we have added random effects to control for unobserved heterogeneity, without considering the correlation between the two processes (extensive results not shown). The parameter representing the unobserved heterogeneity, σ, proves to be strongly significant in both equations for both countries. However, it is definitely greater on the process of DMA (σ=2.15 for Italian males and 2.32 for females, σ=5.64 for Polish males and 2.37 for females) than on the transition process to FSI (σ=0.56 for Italian males

and 0.32 for females, σ=2.51 for Polish males and 1.57 for females). Accordingly, by including the unobserved heterogeneity there are greater consequences on the effect of FSI on DMA (the "adaptation effect", in relation to model 1, goes for the Italian sample from 1.64 to 2.54 for males and from 1.79 to 2.90 for females, and for the Polish sample from 1.47 to 18.95 for males and from 2.91 to 4.75 for females) than on the effect of DMA on FSI (the "religious effect", in relation to model 1, goes for the Italian sample from 1.76 to 1.83 for males and from 1.81 to 1.85 for females, and for the Polish sample from 2.02 to 2.96 for males and from 2.13 to 3.17 for females).

The next step was to add the correlation between the two processes as well, thus having a system of two simultaneous equations, taking into account the unobserved heterogeneity (model 2 in tables 6 and 7). We have obtained a negative correlation (-0.28 for Italian males and -0.56 for females, -0.04 for Polish males and -0.41 for females), meaning that among the common latent factors there prevails some factors which act in opposite direction on the two processes (i.e. they support a conciliation between sexual experience and religious participation). When the correlation between the two processes is considered, the mutual positive statistical association between FSI and DMA grows considerably (compare model 1 and 2).

We have then taken into consideration the possible selection mechanism – due to the fact that the analysis is carried out only on the sub-sample of the individuals attending Mass at 13 years old – by resorting to a probit model (Heckman, 1979). A multiprocess model is therefore obtained, where conditioned to attending Mass at 13, the parallel processes of DMA and of FSI are analyzed. Initially we have estimated two separate multiprocess models, one for DMA and one for FSI. For Italian students we have found a significant correlation only between the selection equation and the process of DMA on the male population (analytical results not shown). For the Polish students both correlations were not significant, thus we stopped our analysis for Poland at model 2 step (again, analytical results not shown).

The final model (model 3 in table 6), estimated only for the Italian sample, is a multiprocess model made of three equations simultaneously estimated: a probit regression for the selection mechanism and two interdependent hazard regressions for DMA and FSI. Since in a previous model we found no evidence of a selection mechanism acting on the FSI process, and in order to avoid identification problems in such a complex model, we have decided to constraint equal to 0 the correlation between the probit equation and the hazard equation on the FSI process. We have found that once we account for the correlation between DMA and FSI the selection effect proves to be negligible. As a consequence, the results obtained in model 3 in table 6 are very similar to those obtained in model 2 in table 6.

In all the here considered models, we have found a positive and strong effect of DMA on FSI and of FSI on DMA. Therefore our data provide empirical evidence of the presence of both a "religious effect" (H1) and an "adaptation effect" (H2), for both Italian and Polish university students.

Lastly, we would like to shortly comment on the results obtained for the other covariates, even though the effects are not directly relevant for our analysis, having being included in the model only as control factors. However, Mass attendance of the parents shows a significant effect (in the expected direction) only on the (statistical) risk of DMA,

but not on the risk of FSI (except for Polish girls). Living in the South of Italy has a protective effect both on the risk of DMA and on FSI for female, while it increases the risk of DMA for males. This reflects a gender difference in religious participation in the South (see Rizzi, 2004). In Poland the residence area is not significant for the risk of stopping to go to mass, whereas girls living in Modern districts have a higher risk of experiencing their first intercourse.

Having highly educated parents has a positive effect on both the processes, but it is significant only on FSI for Italy and not at all for Poland. Being in a couple relationship has a strong positive impact on FSI, and a less strong, but significant only for Italian students, impact on DMA.

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TABLES

Table 1a. Some indicators of religiosity of Italian young people and "catholic religion supply" in Italy

	1983	1987	1992	1996	2000
[1] Proportion of high school Italian students (aged 14-18) who frequent the optional course of catholic religion at public schools	---	---	89	88	88
[2] Proportion of civil first marriages	11	12	13	14	15
[3] "Religion is important in my life" (much or very much) (*)	26.9	31.5	33.9	35.8	30.6
[4] Church attendance (at least once a month)	36.4	37.5	35.9	36.2	33.3
[5] "The active care about religion is very important in my life"	12.2	12.7	13.6	14.1	11.3

(*) The same proportions for people aged 18-24 of other countries interviewed in 1993 were the following: 5% Japan; 37% USA; 9% UK; 5% Germany; 7% France; 6% Sweden; 16% Russia (YAA, 1993, p. 118).

Sources:
Indicator [1]: Osservatorio Socio-Religioso del Triveneto, several years.
Indicator [2]: Barbagli et al. (2004) p. 131
Indicators [3]-[5]: Five representative IARD surveys on Italian youth, extracting data for people aged 15-24. As religious participation declines with age, and as the age distribution within age class 15-24 has changed during 1983-2000, we have corrected the data published by Rostan (2002, p. 376), standardizing by age, considering specific rates by age of 1983 as reference. The meaning of each indicator here published for each year is the following: it is the proportion of people (e.g. attending church at least 2-3 times a month) that would have been if the age distribution within age class 15-24 had been the same of that realized in 1983. According to our indicators adjusted by age, religiosity decline is smoothed, because of the "aging" of young people (within the class 15-24, the proportion aged 21-24 has changed from 37% in 1983 to 49% in 2000). E.g., the unadjusted values of indicator [4] for the five years – those published by Rostan – are: 36.4, 36.7, 34.9, 34.8 and 31.6.

Table 1b. Religious practice in Poland (Year 2000, December). Row percentages.

		Once a week or more	Once or two times a month	Sometimes during a year	Never
Women aged…	18-24	60	17	15	8
	25-34	58	20	16	6
	35-54	62	16	17	5
	55+	72	11	11	6
Men aged…	18-24	49	16	21	14
	25-34	47	17	23	12
	35-54	49	18	23	10
	55+	60	13	16	11
Aged 18-24	Total	55	17	18	10
	Students	58	13	17	12
Students aged 18-24 living in…	Rural areas	71	14	11	4
	Urban 20,000 or less	72	10	8	10
	Urban 20-100,000	57	14	16	13
	Urban 100-500,000	46	15	25	14
	Urban 500,000 or more	42	12	20	26
Aged 18-24 living in…	Urban 500,000 or more	34	14	27	25

Source: CBOS (2001).

Table 2. Age at first intercourse and attendance of religious services. Odds ratios from four Cox regression models for a representative sample of Italian men and women born in 1966-77 living in the Centre-North and Southern regions, interviewed in 1996 [1]

Attendance of religious services	Men		Women	
	Centre North	South	Centre North	South
Never	2.5**	1.9**	1.9**	2.3**
1-2 times every three months	2.1**	1.5+	1.8**	1.5++
1-2 times a month	1.8*	1.4+	1.7**	1.6*
Once a week or more (reference)	1	1	1	1
Total (censored)	342 (60)	250 (49)	350 (54)	265 (76)

** p<0.01 * 0.01<p<0.05 ++ 0.05<p<0.10 + 0.10<p<0.20

[1] The following variables are pooled in each of the four models: *Population in the place of residence* (< or > 10,000); *Education* (low, medium, high); *Going out at night* (never, 2-3 times a week, every night); *Night-clubbing and discos* (once a month or more, 1-2 times every three months, never in the past three months); *To be successful it is better...* (to risk, to be prudent); *Frequency of risk in everyday life* (often, frequently, sometimes, never); *Ever taken drugs* (yes, no); *Satisfaction with physical appearance* (very, quite, not satisfied); *Satisfaction with psychological tranquillity* (very, quite, not satisfied). Other variables are not in the models as they are not statistically relevant: parents' social class and education; relation and affective communication within family; number of siblings; extra -school activities.

Source: Castiglioni, 2004, p. 29.

Table 3. Contrasting some ethical attitudes between young Catholics and people without religion[1]. Italian young people aged 15-34 interviewed in 2000. % that do agree[2].

	Catholics (1)	*Far from any religion (2)*	*Ratio (2) / (1)*
It is admissible...			
... to cohabit without marriage	79	96	1.22
... to have extramarital sexual intercourse	77	94	1.22
... to try to have a child using IVF	67	84	1.25
... to divorce	63	89	1.41
... to have homosexual experiences	38	69	1.82
... to have sex with a married person	33	63	1.91
... to have an abortion	32	74	2.31
Total	(405)	(202)	---
% on total sample	27.2%	13.5%	---

[1] Catholics are people believing in one God, and going Mass at least once a month. People without religion do not believe in God and never go Mass.

[2] The differences between the two groups are statistically significant ($p<0.001$ of CHI^2 test applied to 2x2 contingent table merging the two groups).

Source: Rostan, 2002, pp. 380-381.

Table 4a. Proportion of Italian students who stopped attending Mass at least two times a month and experienced their first sexual intercourse by gender and exact age. Kaplan-Meier calculations (SPSS 11.0 software).

	Exact birthdays							
	13	14	15	16	17	18	19	20
	Males (n= 1,615)							
% attending Mass	70.1	63.9	53.4	44.8	37.4	30.3	24.9	22.6
% virgins	100	99.6	96.7	91.2	83.4	69.7	55.9	46.2
	Females (n= 2,443)							
% attending Mass	82.8	77.4	68.4	59.2	51.0	45.5	39.8	35.9
% virgins	100	99.9	97.2	92.6	82.3	70.0	55.8	47.8

Source: Micro-data of Survey on Italian Students. 4,058 people who correctly answered to the questions on the age at first intercourse and the age at stopping Mass attendance.

Table 4b. Proportion of Polish students who stopped attending Mass at least two times a month and experienced their first sexual intercourse by gender and exact age. Kaplan-Meier calculations (SPSS 11.0 software).

	Exact birthdays							
	13	14	15	16	17	18	19	20
	Males (n=616)							
% attending Mass	85.2	82.5	76.1	71.1	66.9	60.9	54.5	52.2
% virgins	100.0	98.9	96.4	90.3	75.7	61.5	50.2	40.4
	Females (n=935)							
% attending Mass	88.3	86.4	82.9	78.7	76.3	72.6	69.8	68.2
% virgins	100.0	99.8	99.1	95.3	87.4	76.3	65.0	53.2

Source: Micro-data of Survey on Polish Students.1,551 people who correctly answered to the questions on the age at first intercourse and the age at stopping Mass attendance.

Table 5a. Percent distribution of the variables used in the statistical models – Italy (see table 6)

	All respondents		Those who attended mass at 13	
VARIABLE	male	female	male	female
Mass attendance at 13				
At least two times a month (Always)	-	-	89.9	93.5
Once a month (Sometimes)	-	-	10.1	6.5
Father mass attendance when the respondent was 13				
Weekly	32.0	31.8	43.9	38.2
Sometimes	6.3	5.7	7.4	6.0
Never	61.7	62.5	48.7	55.8
Mother mass attendance when the respondent was 13				
Weekly	49.6	49.6	63.4	59.0
Sometimes	7.2	8.0	7.6	7.6
Never	43.2	42.4	29.0	33.4
Geographical area				
Centre-north	69.2	61.7	69.8	60.4
South	30.2	36.8	29.6	38.8
Abroad	0.6	1.5	0.6	0.8
Education of parents				
F low, M low	23.8	33.2	23.7	34.4
F high, M low	13.9	14.4	15.2	14.8
F low, M high	10.7	11.4	10.1	11.6
F high, M high	51.6	41.0	51.0	39.2
Number of cases	1,615	2,443	1,046	1,911

Table 5b. Percent distribution of the variables used in the statistical models – Poland (see table 7)

	All respondents		Those who attended mass at 13	
VARIABLE	male	female	male	female
Mass attendance at 13				
At least two times a month (Always)	-	-	94.3	94.2
Once a month (Sometimes)	-	-	5.7	5.8
Father mass attendance when the respondent was 13				
Weekly	55.4	52.6	60.2	57.1
Sometimes	28.2	31.2	27.1	29.6
Never	16.4	16.2	12.7	13.3
Mother mass attendance when the respondent was 13				
Weekly	72.2	67.4	78.1	72.8
Sometimes	19.7	25.1	17.9	22.3
Never	8.1	7.5	4.0	4.9
District type				
Rural	32.3	23.6	33.5	24.3
Industrial	20.9	24.5	20.8	25.4
Modern	39.0	46.2	37.9	44.6
Other	7.8	5.7	7.8	5.7
University				
Warsaw	46.4	19.3	45.5	17.9
Other	54.6	80.7	54.5	82.1
Education of parents				
F low, M low 1	2.2	3.0	2.3	2.9
F high, M low 2	3.1	3.1	2.9	3.3
F low, M high 3	3.6	5.0	3.7	4.6
F high, M high	91.1	88.9	91.1	89.2
Number of cases	616	935	540	833

Table 6. Relative risk of having sex after ceasing to go Mass (reference group: students going Mass at least once a month)
and ceasing going Mass after having had the first sexual intercourse (reference group: virgin students).

	Italy		Poland	
	Males	**Females**	**Males**	**Females**
Discontinuity Mass Attendance → First Sexual Intercourse	1.76	1.81	2.02	2.13
First Sexual Intercourse → Discontinuity Mass Attendance	1.64	1.79	1.47	2.91

Note: see the complete models in the Appendix, tables 8 (Italy) and 9 (Poland), model (1).
All the coefficients are statistically significant ($p<0.01$)

Table 7. All university students aged 19-21 by sexual intercourse and Mass attendance

		Italy		Poland	
		Males	**Females**	**Males**	**Females**
1	*Virgin people going Mass at least once a month*	15.2	20.4	22.3	41.8
2	*Not virgin people going Mass at least once a month*	8.5	13.3	29.2	26.7
3	*Virgin people not going Mass at least once a month*	23.2	19.9	4.2	8.7
4	*Not virgin people not going Mass at least once a month*	53.1	46.4	34.3	22.8
	Total	100	100	100	100

Table 8. Multiprocess models on the risk of first intercourse and on the risk of discontinuing Mass attendance – Italy. University students attending Mass at 13 years old.

Covariates			Relative risks					
			Males			Females		
			Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*
HAZARD MODEL FOR FIRST SEXUAL INTERCOURSE (FSI)								
Spline								
Constant			-6.06 ***	-6.25 ***	-6.25 ***	-7.22 ***	-7.19 ***	-7.18 ***
Age 13-14			0.88 ***	0.84 ***	0.84 ***	0.93 ***	0.89 ***	0.89 ***
Age 15-16			0.47 ***	0.48 ***	0.48 ***	0.53 ***	0.52 ***	0.52 ***
Age 17-18			0.10	0.16 *	0.16 **	0.12 **	0.12 **	0.12 **
age 19 and more			-0.12 *	-0.10	0.10	-0.14 ***	-0.14 ***	-0.14 ***
TIME CONSTANT COVARIATES								
Attended Mass at 13	Always		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		0.98	0.93	0.93	1.05	0.99	0.99
Father attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		1.16	1.15	1.15	1.13	1.09	1.09
	Never		1.25	1.26	1.26	1.25	1.22 *	1.22 *
Mother attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		0.98	0.97	0.97	0.95	0.91	0.91
	Never		0.77	0.75	0.75	1.12	1.07	1.07
Geographical area of residence	North-Centre		1.00	1.00	1.00	1.00	1.00	1.00
	South		0.95	0.93	0.94	0.81 ***	0.81 ***	0.81 ***
	Abroad		1.45	1.60	1.60	0.53 *	0.55	0.55
Education of father F *and mother* M	F low	M low	1.00	1.00	1.00	1.00	1.00	1.00
	F high	M low	1.02	1.02	1.02	1.20 *	1.20 *	1.20 *
	F low	M high	1.06	1.04	1.04	1.30 **	1.30 **	1.30 **
	F high	M high	1.18 *	1.21 *	1.21 *	1.14 *	1.13 *	1.13 *
TIME VARYING COVARIATES								
Couple relationship	Never		1.00	1.00	1.00	1.00	1.00	1.00
	Yes		5.07 ***	5.64 ***	5.64 ***	11.27 ***	11.39 ***	11.38 ***
Stop Mass attendance	No		1.00	1.00	1.00	1.00	1.00	1.00
	Yes		1.76 ***	2.32 ***	2.28 ***	1.81 ***	2.31 ***	2.33 ***

(continues)

Table 8. (continued)

Covariates			Relative risks					
			Males			Females		
			Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*
HAZARD MODEL FOR DISCONTINUING MASS ATTENDANCE (DMA)								
Spline								
Constant			-4.39 ***	-10.58 ***	-10.98 ***	-4.18 ***	-9.18 ***	-9.17 ***
Age 13-14			0.78 ***	2.27 ***	2.35 ***	0.55 ***	1.68 ***	1.67 ***
Age 15-17			0.03	0.71 ***	0.75 ***	-0.11***	0.37 **	0.36 **
Age 18-19			-0.24 **	0.11	0.12	-0.05	0.16	0.16
Age 20 and more			-0.57 ***	-0.46 **	-0.45 **	-0.47 ***	-0.35 **	-0.35 **
TIME CONSTANT COVARIATES								
Attended Mass at 13	Always		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		2.05 ***	9.81 ***	10.41 ***	1.98 ***	8.47 ***	8.39 ***
Father attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		1.56 ***	3.19 ***	3.24 ***	1.43 ***	2.31 ***	2.29 ***
	Never		1.82 ***	6.05 ***	5.88 ***	1.59 ***	2.88 ***	2.77 **
Mother attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00	1.00	1.00
	Sometimes		1.25 **	1.84 **	1.77	1.74 ***	3.57 ***	3.34 **
	Never		1.47 **	2.61 *	2.38	1.90 ***	5.59 ***	4.91
Geographical area of residence	North-Centre		1.00	1.00	1.00	1.00	1.00	1.00
	South		1.25 ***	2.54 ***	2.64 ***	0.88 **	0.80	0.81
	Abroad		0.86	0.46	0.44	1.01	0.83	0.79
Education of father F *and mother* M	F low	M low	1.00	1.00	1.00	1.00	1.00	1.00
	F high	M low	0.99	0.87	0.88	0.93	0.96	0.94
	F low	M high	0.96	0.96	0.94	0.98	1.00	1.00
	F high	M high	1.13	1.32	1.34	1.09	1.32	1.29
TIME VARYING COVARIATES								
Couple relationship	Never		1.00	1.00	1.00	1.00	1.00	1.00
	Yes		1.19 **	1.46 *	1.48 **	1.51 ***	1.90 ***	1.90 ***
Sexual intercourse	Never		1.00	1.00	1.00	1.00	1.00	1.00
	Yes		1.64 ***	3.93 ***	3.97 ***	1.79 ***	3.89 ***	3.95 ***

(continues)

Table 8. (continued)

Covariates			Relative risks					
			Males			Females		
			Model 1	*Model 2*	*Model 3*	*Model 1*	*Model 2*	*Model 3*
PROBIT MODEL (SELECTION) FOR MASS ATTENDANCE AT 13 YEARS OLD								
Constant			-	-	-1.71 ***	-	-	-2.36 ***
TIME CONSTANT COVARIATES								
Father attended Mass when the child was 13	Weekly		-	-	1.00	-	-	1.00
	Sometimes		-	-	1.57 ***	-	-	1.18
	Never		-	-	3.37 ***	-	-	1.73 ***
Mother attended Mass when the child was 13	Weekly		-	-	1.00	-	-	1.00
	Sometimes		-	-	2.04 ***	-	-	3.26 ***
	Never		-	-	4.44 ***	-	-	5.83 ***
Residence during high school	Centre-North		-	-	1.00	-	-	1.00
	South		-	-	1.23 **	-	-	0.80 **
	Abroad		-	-	1.86	-	-	1.64 **
Education of father F *and mother* M	F low	M low	-	-	1.00	-	-	1.00
	F high	M low	-	-	0.77 *	-	-	1.25
	F low	M high	-	-	0.86	-	-	1.09
	F high	M high	-	-	1.05	-	-	1.48 ***
UNOBSERVED HETEROGENEITY AND CORRELATION								
Unobserved heterogeneity for FSI			-	0.58 ***	0.58 ***	-	0.29	0.29
Unobserved heterogeneity for DMA			-	2.83 ***	2.95 ***	-	2.54 ***	2.54 ***
Correlation: FSI & DMA (*r1*)			-	-0.28 **	-0.26 **	-	-0.56	-0.57
Correlation: FSI & selection (probit model) (*r2*)			-	-	0.00[a]	-	-	0.00[a]
Correlation: DMA & selection (probit model (*r3*)			-	-	-0.11	-	-	-0.12

p*** p<0.01, ** 0.01<p<0.05, * 0.05<p<0.10

[a] Equal to 0.

Table 9. Multiprocess models on the risk of first intercourse and on the risk of discontinuing Mass attendance – Poland. University students attending Mass at 13 years old.

Covariates			Relative risks			
			Males		Females	
			Model 1	*Model 2*	*Model 1*	*Model 2*
HAZARD MODEL FOR FIRST SEXUAL INTERCOURSE (FSI)						
Spline						
Constant			-4.38 ***	-6.79 ***	-7.12 ***	-7.73 ***
Age 13-14			0.61 **	0.89 ***	1.15 **	0.79
Age 15-16			0.57 ***	1.18 ***	0.56 ***	0.68 ***
Age 17-18			-0.12	0.37 ***	0.30 *	0.33 ***
age 19 and more			0.02	0.23 *	0.03	0.27 ***
TIME CONSTANT COVARIATES						
Attended Mass at 13	Always		1.00	1.00	1.00	1.00
	Sometimes		1.06	1.65 **	1.27 **	1.44 *
Father attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00
	Sometimes		1.12	0.71	0.77 *	0.74
	Never		1.02	1.00	0.65 **	0.44 ***
Mother attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00
	Sometimes		0.96	0.94	1.49 ***	1.72 **
	Never		0.78	0.52	1.38	1.53
District of residence	Modern		1.00	1.00	1.00	1.00
	Rural		1.02	0.98	0.63 ***	0.48 ***
	Industrial		0.95	0.75	0.72 ***	0.63 **
	Other		1.48 *	3.27 ***	0.68 *	0.47 **
University	Warsaw		1.00	1.00	1.00	1.00
	Other		0.69 ***	0.39 ***	0.81	0.62 **
Education of father F *and mother* M	F low	M low	1.00	1.00	1.00	1.00
	F high	M low	0.48	0.32	0.60	0.47
	F low	M high	0.43 **	0.21 **	0.72	0.55
	F high	M high	0.80	0.73	0.98	0.88
TIME VARYING COVARIATES						
Couple relationship	Never		1.00	1.00	1.00	1.00
	Yes		3.87 ***	13.61 ***	11.17 ***	24.11 ***
Stop Mass attendance	No		1.00	1.00	1.00	1.00
	Yes		2.02 ***	2.73 ***	2.13 ***	7.23 ***

(continues)

Table 9. (continued)

Covariates			Relative risks			
			Males		Females	
			Model 1	*Model 2*	*Model 1*	*Model 2*
HAZARD MODEL FOR DISCONTINUING MASS ATTENDANCE (DMA)						
Spline						
Constant			-5.58 ***	-8.32 ***	-6.62 ***	-11.00 ***
Age 13-14			0.73 ***	1.15 ***	1.24 ***	2.11 ***
Age 15-17			0.05	0.31 **	-0.10	0.23
Age 18-19			0.30 *	0.50 ***	-0.20 *	-0.13
Age 20 and more			-1.48 ***	-1.39 ***	-0.66 ***	-0.82 **
TIME CONSTANT COVARIATES						
Attended Mass at 13	Always		1.00	1.00	1.00	1.00
	Sometimes		1.66 ***	2.63 ***	1.77 ***	2.76 ***
Father attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00
	Sometimes		1.07	1.28	1.34	1.54
	Never		3.12 ***	6.29 ***	3.44 ***	6.90 ***
Mother attended Mass when the child was 13	Weekly		1.00	1.00	1.00	1.00
	Sometimes		1.94 ***	3.05 ***	1.82 ***	2.68 **
	Never		2.39 ***	4.92 ***	3.16 ***	20.18 ***
District of residence	Modern		1.00	1.00	1.00	1.00
	Rural		1.03	1.17	0.98	1.39
	Industrial		1.01	0.97	0.94	1.00
	Other		1.22	1.15	0.59	0.37
University	Warsaw		1.00	1.00	1.00	1.00
	Other		1.65 ***	1.89 ***	1.69 ***	2.93 ***
Education of father F *and mother* M	F low	M low	1.00	1.00	1.00	1.00
	F high	M low	2.05	2.62	0.32 *	0.13 *
	F low	M high	1.31	0.74	0.25 *	0.09 *
	F high	M high	1.21	1.09	0.68	0.55
TIME VARYING COVARIATES						
Couple relationship	Never		1.00	1.00	1.00	1.00
	Yes		1.04	1.10	1.54 **	1.20
Sexual intercourse	Never		1.00	1.00	1.00	1.00
	Yes		1.47 ***	2.27 ***	2.91 ***	12.21 ***

(continues)

Table 9. (continued)

Covariates	Relative risks			
	Males		Females	
	Model 1	*Model 2*	*Model 1*	*Model 2*
UNOBSERVED HETEROGENEITY AND CORRELATION				
Unobserved heterogeneity for FSI	-	2.30 ***	-	1.50 ***
Unobserved heterogeneity for DMA	-	1.78 ***	-	2.24 ***
Correlation: FSI & DMA (*r1*)	-	-0.04	-	-0.41 ***

p*** p<0.01, ** 0.01<p<0.05, * 0.05<p<0.10