

First Sexual Intercourse and Church Attendance: the Interdependent Association among Italian Students

*L'Età al Primo Rapporto Sessuale e la Frequenza alle Funzioni Religiose:
Interdipendenza tra i Due Processi fra gli Studenti Italiani*

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Riassunto: I rischi statistici di primo rapporto sessuale e di abbandono della frequenza alla messa vengono analizzati simultaneamente, in funzione di fattori osservati e non osservati comuni e specifici. I due processi sono positivamente interrelati. Ciò conferma per l'Italia - a differenza di quanto osservato in altri paesi (ad es. gli USA) - la presenza sia di un "effetto religione" che di un "effetto adattamento" post iniziazione sessuale.

Keywords: age at first sex, religion, unobserved heterogeneity, interdependent processes, even-history analysis

1. Introduction

Christian people share ethical norms opposing extra-marital sex. Consequently, the association between religion and timing at first sex could be bi-directional: (1) when people relax their adhesion to Church, the statistical risk of having first sex should improve (*religiosity effect on sex*); (2) when young Christians have first sex, their connection with religion should diminish (*religiosity adaptation after first sex*).

The presence and the strength of these connections change with time and space. First sex is delayed among people near the Christian Churches in almost every country where it has been measured, although the strength of this association is not the same everywhere (Coppola, 2003). The influence of first sex on subsequent religious attitudes and behavior is less clear. There is no research on the topic for Europe; and two studies in the USA have not found any significant effect (Meier, 2003). Evidently, many American young people do not consider sexual intercourse to be in contrast with a full adhesion to Christian religion: it could be an example of a religious *bricolage* – a characteristic of recent years underlined by many authors (see, e.g., Garelli, 2000).

In this paper we study the relationship between first sex and church attendance among Italian university students, using simultaneous equations and taking into account unobserved heterogeneity and correlation between the two processes.

2. Data, hypotheses and statistical model

We shall use data from the survey on Sex of Italian Students (SIS), a national representative sample of about 5,000 students of the first two years of Statistical and Economical Sciences attending state universities in Italy, aged 19-21, and interviewed in 2000-01 (Crisafulli and Dalla Zuanna, 2004). Interviewees were asked the month and the year at first sex (15.0% and 5.4% of non-response), attendance at mass at 13 (1.7% of non-response) and at interview (1.3% of non-response), and age when they stopped attending church (1.9% non response among the eligible people).

We study the causal interdependence between the onset of first intercourse and religion. Specifically we would like to study the effect of discontinuing church attendance on sexual debut and, conversely, the effect of the first sexual experience on discontinuing mass attendance. For this last process we select as target population youths who at 13 attended mass at least once a month (about 72.4% of the total sample). We use an event history approach, particularly adopting simultaneous hazard rate equations.

Given the strong diversity of sex behavior between males and females, we perform two separate analyses. Considering the importance of the role of the parents (and especially parental attitudes; Musik and Bumpass 1999; Miller et al., 1997) we include into the model as control variables: the education and the religiosity of the parents, and the type of relationship between parents and adolescent child. As a time-varying covariate we also consider the affective couple relationship. 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. After having controlled for these factors, we can check if discontinuing mass attendance have a positive impact on the risk of first sexual intercourse (*religious effect*) and, conversely, if sexual debut have a positive impact on the risk of discontinuing mass attendance (*adaptation effect*).

The statistical specification of our model is derived from the framework developed by Lillard (1993). It consists of two simultaneous hazard rate equations, modeling time (from age 13) to First Intercourse and to Discontinuing Mass Attendance respectively.

$$\begin{cases} \ln h_i^{FI}(t) = y_i^{FI}(t) + \sum_j a_j x_{ij} + \sum_k \alpha_k w_{ik}(t) + \delta \\ \ln h_i^{DMA}(t) = y_i^{DMA}(t) + \sum_j b_j x_{ij} + \sum_k \beta_k w_{ik}(t) + \varepsilon \end{cases}$$

Each $y(t)$ denotes a piecewise linear spline that captures the effect of the time on the risk. The $\{x_{ij}\}$ denotes time constant covariates. The $\{w_{ik}(\cdot)\}$ are a set of the time varying covariates, whose values change at discrete times and that are constant in time between these changes. The random variables δ and ε capture the unobserved heterogeneity, and are assumed to have a joint bivariate normal distribution ($\rho_{\delta\varepsilon}$ is the correlation between the unobserved heterogeneity terms of the process). The model estimation was performed using full-information maximum likelihood, as implemented in the package aML 1.04 (Lillard and Panis, 2000).

3. Results

As expected, and confirming the results from other surveys, the *religiosity effect* is significant: stopping church attendance increases the risk of sexual debut. The *adaptation*

effect too is consistent: having first sex increases the risk of discontinuing mass attendance (TABLE 1). The hypothesis of a *religiosity adaptation after first sex* seems therefore to find more empirical evidence among the Italian students than the US youth. Moreover, the affective couple relationship is significant in accelerating the first intercourse, while low religiosity parents' accelerates the discontinuing mass attendance.

Table 1: *Model estimates on the risk of first sex and of stopping attending mass.*

		HAVING FIRST SEX		STOPPING MASS ATTENDANCE	
		Males	Females	Males	Females
SPLINE	Baseline constant	-6.12***	-7.22***	-7.87***	-7.02***
Slopes:	Age 13-14	0.83***	0.89***	1.57***	1.18***
	15-16 (15-17 for mass)	0.46***	0.53***	0.42***	0.19**
	17-18 (18-19 for mass)	0.12*	0.14**	-0.05	0.07
	19+ (20+ for mass)	-0.11*	-0.13***	-0.50**	-0.39***
TIME CONSTANT COVARIATES					
<i>Usually attended mass at 13</i>					
Always		1.00	1.00	1.00	1.00
Sometimes		0.89	1.01	5.43 ***	5.11 ***
<i>Father usually attended mass when the child was 13</i>					
Weekly		1.00	1.00	1.00	1.00
Sometimes		1.13	1.10	2.34 ***	1.83 ***
Never		1.21	1.24 **	3.76 ***	2.17 ***
<i>Mother usually attended mass when the child was 13</i>					
Weekly		1.00	1.00	1.00	1.00
Sometimes		0.96	0.92	1.62 **	2.68 ***
Never		0.74	1.08	2.04 *	3.78 ***
<i>Residence during high school</i>					
Centre-North		1.00	1.00	1.00	1.00
South		0.92	0.81 ***	1.94 ***	0.82 *
Abroad		1.55	0.53	0.86	1.40
<i>Education of father F and mother M</i>					
F low M low		1.00	1.00	1.00	1.00
F high M low		1.03	1.21 **	0.92	0.89
F low M high		1.05	1.31 *	0.94	1.00
F high M high		1.20 *	1.13 *	1.25	1.21
<i>Relationship with parents during adolescence</i>					
F close M close		1.00	1.00	1.00	1.00
F distant M close		0.76 **	1.04	1.35	1.37 **
F close M distant		1.12	1.15	1.81	1.16
F distant M distant		1.17	1.29	1.85	0.67
TIME VARYING COVARIATES					
<i>Couple relationship</i>	Never	1.00	1.00	1.00	1.00
	Yes	5.34 ***	11.63 ***	1.34 *	1.71 ***
<i>Mass attendance</i>	Yes	1.00	1.00	---	---
	No	2.54 ***	2.18 ***	---	---
<i>Sexual intercourse</i>	Virgin	---	---	1.00	1.00
	Not virgin	---	---	3.49 ***	3.05 ***
<i>Unobserved heterogeneity</i>					
Delta (Epsilon)		0.48 ***	0.35 ***	1.89 ***	1.80 ***
Rho		-0.55 ***	-0.33 ***	-0.55 ***	-0.33 ***

Notes: * 0.10< p<0.05 ** 0.05< p<0.01 *** p<0.01

The correlation between the processes is significant and negative: in the unobserved heterogeneity common to the two processes the action of factors that have an opposite

impact on the risk of first sex and on the discontinuation of mass attendance prevails. This confirms the importance of a simultaneous analysis of the two processes and of taking into account the correlation between the common unobserved factors (which otherwise could partly make the relationship between the two studied events spurious). Hence, while the mutual causal relationship between the two events is positive there are some common unobserved factors that negatively link (spuriously) the sexual debut and mass discontinuation. These last results are somehow unexpected. Therefore it would be interesting to further investigate the nature of these factors with some more detailed analyses and surveys.

4. Final remarks

We have simultaneously analyzed the statistical risk at first sexual intercourse and the risk of discontinuing mass attendance, focusing on the mutual causal effect between the two events and controlling for observed and unobserved factors, either common or specific to the single process. The results confirm both the hypotheses of the *religious effect* and of the *adaptation effect*. The overall action of the common unobserved factors has an opposite impact on the two processes, generating a negative spurious link.

In these models we have confined our analysis to the youths attending mass at 13 (72.4% of our sample). The model can be further generalized and made more complex and rigorous by accounting for selection into the sample based on attending mass at 13 years old. This is in our agenda, using for example Heckman method. However, since the main substantive result (i.e. the presence of a reciprocal influence between first sex and religion in Italy) is so strong and clear, we expect similar findings explicitly accounting for selection.

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