Trends and associations between religion, religiosity and sexual initiation in Brazil [*]

Ana Paula de Andrade Verona[♣]
Cláudio Santiago Dias Júnior[♦]

Resumo

Declining age at first sexual intercourse have been accompanied by a transformation in Brazil's religious landscape, which has been marked by the significant growth of evangelical Protestantism, led by Pentecostalism, and the emergence of the Charismatic Catholic renewal movement. This paper employs data from three DHS carried out over the period 1986-2006 in Brazil and a Cox proportional hazard model in order to examine trends and associations between religion, as measured by religious affiliation and attendance at religious services, and adolescents' (15-19) pre-marital sexual initiation. Findings reveal that even after controlling for demographic, socioeconomic, and community variables, adolescents' pre-marital sexual initiation differs across religious affiliation and attendance patterns in Brazil: those who belong to traditional Protestant or Pentecostal churches, as well as those that attend church frequently, are at the lowest risk of engaging in pre-marital sexual activity. However, when variables representing combinations of religious affiliation and attendance are analyzed, differentials within the same religion are high in magnitude and statistically significant. Results of this study, therefore, make clear the benefit in considering and examining attendance at religious services in studies on religion in Brazil, and not only religious affiliations.

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1 – Introduction

Brazil experienced large and rapid fertility declines over the period from 1960 and 2006, when the Total Fertility Rate (TFR) dropped from 6.3 to 1.8 children. During this process, it is everywhere known that older age groups presented steeper declines, causing a concentration of fertility at younger ages (Gupta, 2000; Gupta and Leite, 1999). Besides this unequal fertility decline across the reproductive age groups, the 1990's added a new factor that contributed to the concentration of fertility at younger ages: the rise of fertility rates among adolescent women, defined as the population aged 15-19 (Berquó and Cavenaghi, 2005). Estimates from the Brazil Demographic and Health Survey (DHS), for example, show that the age-specific fertility rates (ASFR) for adolescents increased from 74 births per 1,000 women in 1986 to 86 in 1996.

The 2006 PNDS[1] (*Pesquisa Nacional de Demografia e Saúde- Demographic and Health National Survey)* revealed a slight decrease (to 83 births per 1,000 women) of adolescent fertility in Brazil since 1996. Nevertheless, the period between 1996 and 2006 also witnessed a greater fertility decline among the other age groups (from 20-24 to 45-49 years of age) when compared to that presented by adolescent mothers. Consequently, the proportional contribution of births among adolescents increased from eleven to 17 percent between 1986 and 1996, and then to 23 percent in 2006. Thus, almost one out of every four births in 2006 was to a teenage mother in Brazil. During the same period, the average age at first sexual intercourse – one of the proximate determinants of fertility – largely reduced.

Using a cohort perspective, Heaton, Forste, and Otterstrom (2002) estimated the median age at first intercourse for birth cohorts form the 1940s to the 1970s among 13 Latin American countries. They found that Brazil was the only Latin American country that presented a noticeable decline in this median, which dropped from 20.2 to 18.7 years across those birth cohorts. Likewise, Brazil and Colombia were the only places that showed a steady increase in the proportion experiencing pre-marital sex. Recently, results from the 2006 DHS showed that the proportion of teenagers who reported never having had sex was 45% at year in Brazil. This represents a substantial decline, since this proportion was 80% and 67% in 1986 and 1996, respectively.

In many countries, concern regarding adolescent sexual and reproductive health is evident both because of the increase in the pre-marital and unplanned fertility, and in part because of the high risk associated with adverse health effects, such as acquiring sexually transmitted diseases, elevated risks of pregnancy-related and unsafe abortion. Other

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[♣] The University of Texas at Austin
[♦] Universidade Federal de Minas Gerais
[1] This survey is also part of the MEASURE DHS and will be called here as the 2006 Brazil DHS.

problematic consequences of experiencing sexual initiation earlier are frequently associated with dropout from school and lack of social support from family and partners (Gupta, 2000; Bongaarts and Cohen, 1998).

Previous studies have suggested several determinants associated with adolescent sexual and reproductive behavior in Brazil. Among the many factors, education is considered one of the most important. In general, lower education is associated with lower age at first intercourse, lower age at first birth, and higher adolescent fertility in Brazil (Leite et al. 2004; Gupta, 2000). In addition, age, exposure to mass media, childhood residence, degree of urbanization, geographic regions of residence, aspects of household quality, among other factors, tend to shape adolescent sexual decision-making in this country.

Much less is known about the implications of religious involvement for adolescent sexual and reproductive behavior in Brazil. One of the few studies that contributed to this topic was conducted by McKinnon, Potter and Garrard-Burnett (2008) that explored the relationships between Protestantism and fertility and family formation among adolescents aged from 15 to 17 living in the metropolitan region of Rio de Janeiro. The authors note that the odds of ever having had a live birth for adolescent women belonging to Baptist, other Mainline Protestant, Assembly of God, and other Pentecostal churches is reduced by about one third when compared with Catholics. They also explain that adolescents who belong to the Assembly of God, other Pentecostal Protestant, or other mainline Protestant churches are much more likely to be married than Catholics.

Declining age at first sexual intercourse have been accompanied by a transformation in Brazil's religious landscape, which has been marked by the significant growth of evangelical Protestantism, led by Pentecostalism, and the emergence of the Charismatic Catholic renewal movement. Both phenomena have been attracted special attention from adolescents and young people in Brazil, who have actively participated in several activities within these religious groups.

Among the existing social, economic, and demographic factors that may affect adolescent sexual and reproductive behavior in Brazil, religion deserves further consideration, not only because this country has experienced tremendous change in its religious landscape during the last decades, but also because religion is both a primary socialization agent of adolescents and sexual activity is a sphere of human behavior considered high in religious applicability (Regnerus, 2007). Even so, the association between religion and adolescent sexual and reproductive behavior in Brazil has not received extended attention. Toward that end, this article evaluates trends and associations between religion, as measured by religious affiliation and attendance at religious services, and adolescent pre-marital sexual initiation in Brazil.

2 – Pentecostalism and the Catholic Charismatic Renewal

The last decades have witnessed a rapid and widespread pluralization of Brazil's religious landscape, which has been characterized by a tremendous variety of religious beliefs and practices, as well as uptake of new religious patterns (Pierucci and Prandi, 2000; Decol, 1999; Chesnut, 1997; Burdick, 1993; Bruneau, 1982). This paper emphasizes two religious movements that have recently attracted special attention in this process of religious transformation in Brazil: the emergence of Pentecostal Protestantism and the movement of Catholic Charismatic Renewal (CCR).

Pentecostalism is a twentieth century phenomenon that spurred the growth of Protestantism in Brazil during the past several decades (Mariano, 2004; Decol, 1999). Unlike traditional Protestant churches, Pentecostalism has been characterized by its strong emphasize on the workings of the Holy Spirit as manifested in the gifts of divine healing, glossolalia (speaking of tongues), and prophecies.

The recent growth of Pentecostal Protestantism in Brazil has called attention to social and demographic consequences of religious conversion. In this context, Chesnut (1997) explains that Pentecostal Protestantism enjoyed overwhelming success in appealing to their followers (the great majority of them has been poor people) based on the idea of a positive transformation for this group. Believers, for instance, cannot claim to be fully converted until they have completely abandoned several *mundane* pleasures. Some Pentecostal churches, for instance, strongly disapprove alcohol consumption, drug use, smoking, pre-marital and non-marital sex as well as modern coiffures or dressing, and use of cosmetics (Mariano, 2004; Burdick, 1993).

In an ethnographic study conducted in Brazil, John Burdick talked about these prohibitions and how they may influence the lives and behaviors of Brazilian youth. He argued, for example, that courting is closely regulated in Pentecostal churches, such as the Assemblies of God, where pre-marital sex is considered a very serious sin. According to the author, "those who surrender to temptation [pre-marital sex] may be severely disciplined, even excluded from communion for a time, and may suffer the withdrawal of the Holy Spirit" (Burdick, 1993: p. 131).

The CCR, on the other hand, was introduced in Brazil in the early 1970s, since when its popularity has sharply increased, making it the largest and most active Catholic lay movement there[2] (and in most Latin American countries too) (Valle, 2004; Chesnut, 2003; Pierucci and Prandi, 2000). The CCR has been a revitalization movement in Brazil that resulted of at least one motivation: to compete with the Pentecostal Protestantism. Many of the changes in discourse, lifestyle, local participation, and the way to practice the faith among Pentecostal Protestants are also prevalent within the charismatic Catholic movement in Brazil (Cleary, 2007). Among other things, the CCR places special emphasis on the sphere of intimacy and contra-cultural lifestyles, specially regard to the family, habits, and sexuality (Pierucci and Prandi, 2000). For instance, charismatic Catholics combat promiscuous sexual behavior and offer support for youth persons who desire to remain celibate until marriage (Cleary, 2007).

Charismatic Catholics, similarly to Pentecostal Protestants, tend to intensely participate inside their religious groups and demonstrate a strong missionary attitude toward non-members and recruitment of friends, relatives, and associates (Cleary, 2007). Also, adherents and new participants are expected to join small prayer groups, better called communities, which meet on a weekly basis and instruct members to greater spiritual growth. Padre Marcelo Rossi, a very popular Brazilian charismatic priest, is an example of the power of the CCR to congregate and mobilize believers. He has attracted large crowns to different kinds of religious ceremonies and events.

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[2] It was estimated for 2000 that more than seventy-three million charismatic Catholics were present in Latin America, approximately 16 percent of Catholics in the region and more than half of the charismatic Catholics in the world. It was also estimated for the same year a total of almost 107,000 prayer groups for Latin America, representing more than 70 percent of these charismatic Catholics groups in the world. Statistics posted by International Center for Catholic Charismatic Renewal at www.iccrs.org/ccr%20worldwide.htm

3 – Explanations for the influence of religion: direct and indirect effects

Research on religious influence usually notes two types of effects: direct and indirect ones. Direct effects studies of religious influence concern the idea that sacred teachings, norms, and values offered by religious groups may directly affect peoples' behavior. This straightforward influence is found most often when some aspect(s) of religion have an independent effect on the outcome of interest net of other important independent influences (Regnerus, 2003). According to social control and social learning theories of adolescent behavior, religious functions are seen as a source of social and individual control that encourage adolescents to avoid actions that they might otherwise feel like doing (Regnerus, 2007 and 2003). That is, religion is often seen as a directly inhibiting force, which may postpone, reduce, or even prevent certain practices like pre-marital sexual activity.

For instance, both Pentecostal doctrine and the movement of the CCR may discourage this practice since never-married adolescent women who engage in these types of relationships may face evident sanctions at their church or charismatic communities, especially if they get pregnant. Therefore, Pentecostal girls and Catholics who belong to the CCR movement may consider their religious faith and/or the sanctions imposed by their church or communities when making choices about sex and reproduction. Whether this religious influence is noted, one can say that religion is directly affecting individuals' decisions.

Nevertheless, the absence of direct religious effects does *not* mean that religion is not important (Regnerus, 2003). Indeed, the most common way that religion influences human actions is perhaps through indirect influences. These are 'unintentional social byproducts when religious people doing things for religious reasons facilitate other distinctive outcomes' (Regnerus and Smith 2005, p. 24). Research on indirect religious influences always calls attention to mechanisms or pathways by which religion may assist in bringing about a desired outcome. Christian Smith (2003), for instance, formulated an integrated account of religion's influence in the lives of American adolescents, suggesting key factors or pathways through which religion may act. These are aggregated around dimensions, such as: *learned competences* (that comprises community and leadership skills; coping skills; and cultural capital), and *social and organizational ties* (that includes social capital; network closure; and extra community links).

Some of these religious pathways may be closely associated with adolescent's sexual and reproductive behavior. The achievement of leadership skills or elements of cultural capital, for example, is a chance to develop a series of useful capacities, which can occur at different circumstances (*e.g.,* when helping to coordinate a religious workshop, assisting in a tutoring program, or leaning to play a musical instrument) and are very often transported to be used in contexts beyond religious activities, such as neighborhood organizations, political activism, and professional activities (Smith, 2003). The development of these skills through the involvement in church activities can positively affect adolescents' opportunities at school (Glanville, Sikkink and Hernández, 2008; Regnerus, 2000) and in the labor market, increasing their confidence and life chances. Higher expectations and better opportunities may be a motivation (especially to adolescent girls) to avoid certain behaviors, including pre-marital sexual and reproductive decisions, which could be associated with early dropout from school and unplanned pregnancy (Bongaarts and Cohen, 1998). Moreover, because it is expected that religious leaders are to teach values and attitudes as well as provide other adolescents with examples of religious

life practices to emulate, young and never-married religious leaders may feel more pressured to stay away from some behaviors, such as the practice of pre-marital sex.

Another potential source of influence on adolescent's sexual behavior may occur through social ties and support networks provided by religious organizations. Smith (2003) argues that religious institutions emphasize personal interactions with fellow believers of all ages and life-course stages. Favoring a social relationship between youth, parents, friends and other adults is a way to improve youth outcomes, mainly because it creates conditions of increased support for and supervision of youth. These connections can also expand youth's aspirations, developing their maturity, and restrict their free time, which may indirectly affect their sexual and reproductive behavior as well.

4 – Alternative Explanations

The comprehension of the pathways that religion works through is essential for a better understanding of how it may shape individuals' behavior. Nevertheless, the influence of religion on human sexual behavior is often doubted. As pointed out by Regnerus (2007), this skeptical view suggests that the apparent religious influence would be actually caused by three different factors: (1) selection effects, (2) reverse causation, and/or (3) social desirability bias. The first of these, the selection effects, assumes that both the predictor (*e.g.*, religion) and the outcome (*e.g.*, adolescent sexual behavior) are, in fact, a consequence of some other unobservable or unknown factor(s) that causes both independently (Regnerus and Smith, 2005). A given unobserved factor would, therefore, overestimate the statistical results of the effects of religion, attributing then more importance to these effects than they really deserve.

The second explanation, the reverse causation (or religious exit), highlights that causal direction may be inverse, that is, decisions about religion are a product of the outcome under consideration (e.g., sexual behavior) and not the other way around[3] (Regnerus and Smith 2005). Finally, the third alternative explanation is the social desirability bias, which is the inclination to present oneself in a manner that will be viewed favorably by others. Respondents may find themselves embarrassed and may decide to lie rather than telling the true (Regnerus and Uecker, 2007) especially when asked about some kinds of behavior associated, for instance, with religious participation or sexual activity. Such inclination to lie can effect the way how respondents answer research questions, therefore, confounding the results.

5 – Data

This research employs data from three DHS carried out in 1986, 1996, and 2006 in Brazil. All these samples are nationally representative surveys of women aged 15-44 years in 1986 and 15-49 years in 1996 and 2006, which contain detailed information on socio-demographic variables and reproductive and child health. For those women who already

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[3] The religious-strategy explanation is a subset of the general selection effects. According to this explanation, religion can be a strategy to successively achieve a desired result for those who are already predisposed toward certain outcomes (e.g., maintaining virginity). This approach suggests, therefore, that observed outcomes are a result of life orientation and personal goals rather than a result of religion influence per se. So, in order to achieve their goals and desires, people may instrumentally choose to become religiously involved (Regnerus and Smith, 2005).

reported having had sexual intercourse, the DHS asks the age at first time. This information is essential, or at least very helpful, to better understand the association between sexual debut (and the risk of adolescent childbearing) and religious affiliation and religious attendance.

The focus of this article is on trends and associations between religion (measured as religious affiliation and attendance at religious services) and adolescents' (15-19) first sexual experience in Brazil. Since the histories of these women are incomplete, the experiences of young adults aged 20-24 (that group of women who recently completed their teen years) are included. Moreover, because of the confounding effects between marriage and sexual activity, this analysis estimates the risk of pre-marital first sexual intercourse, that is, first intercourse occurring at a younger age than first union, formal or informal, or among women never married before the age of 20[4]. Of the total sample of 5,892, 12,612, and 15,575 women in 1986, 1996, and 2006, respectively, 2,477, 4,528, and 4,993, were aged between 15 and 24 years old, regardless of their marital status.

Because the DHS is based on a stratified two-stage cluster designs, it is necessary to specify the sampling weights and primary sampling units (used in clustering). In *Stata*, one can use the "*svyset*" command, and then produce estimates of standard errors and statistical tests that are corrected for the complex design of the survey. All descriptive and statistical analyses shown here are corrected by this command.

Lastly, it is important to note a limitation of our data: the cross-sectional nature of the DHS makes it impossible to document causal effects. It cannot be clear, for instance, whether or not some women may have changed their religious attitudes and behaviors (e.g., going more or less often to church, or converting from one religious affiliation to another) after having pre-marital sexual intercourse. However, the DHS allows observing the potential association between these events, and, at this point, there are no alternative data set for modeling the association between religion and adolescent pre-marital sexual initiation in Brazil.

5.1 – Variables

The three Brazil DHS classify both religious affiliation and religious attendance into different groups. In order to make comparisons across surveys, it was fundamental to re-classify these variables (as well as each variable used in the descriptive and statistical analyses), creating uniform categories for them. Thus, a new and homogeneous religious affiliation variable has been classified into four groups: (1) Roman Catholicism (the reference category), (2) Protestantism (including Protestants in 1986, Protestants and Evangelicals in 1996, and traditional Protestants and Pentecostals in 2006), (3) others[5] (everybody else), and (4) no religion.

Unlike the Brazilian Censuses, the DHS collects information on attendance at religious services, which allows using a measure of religiosity as well. Information on

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[4] As pointed out by Gupta (2000), it is important to highlight that DHS measures the age at first sexual intercourse and age at first union in completed years. This likely underestimates rates of pre-marital activity because some sexual relations occurring within the few months preceding marriage are counted as marital events.

[5] Taken together, less than five percent of the young women reported belonging to the other religious affiliation groups (Spiritism, Afro-Brazilian religions, Oriental religions, Jewish, and others) in 1986, 1996, and 2006. Therefore, they were aggregated into one group called "others".

attendance at religious services was captured through the following question: "How often do you go to church, temple, or other religious services?" Women chose one of five options in each survey. Again, in an attempt to allow comparisons, a new religious service attendance was created and re-classified into four groups: (1) weekly or more; (2) less than weekly; (3) less than monthly; (4) don't attend (the reference category).

Because adolescent sexual behavior as well as religious affiliation and religious service attendance differ significantly in a number of socioeconomic, demographic, and community characteristics in Brazil, it is important to adjust the results by these factors as effectively as possible. Then, other independent variables used in this analysis include: (1) a dichotomous variable based on the information for age groups: 15-19 years (the reference group) and 20-24; (2) three groups of years of education: 0-4 years (reference), 5-8 years, and nine years and over; (3) A dichotomous variable based on the information for currently living in urban or rural areas (rural is the reference); (4) a dichotomous variable based on the information for residence at childhood (small city is the reference); (5) five categories for region of residence: South, Southeast, North, Northeast (the reference), and Middle West; (6) a dichotomous variable based on the information if watches television weekly (No is the reference); (7) a dichotomous variable based on the information if household has toilet facility (No is the reference).

5. 2 - Cluster-level aggregate variables

We also created three cluster-level aggregate variables; one for the mean education in the cluster, one for the percentage of Protestants within the cluster, and a third one for the percentage of women who do not attend religious services that reside in the cluster. These variables may allow observing if young women who live in communities with distinct levels of education mean and religiosity are exposed to different risks of engaging in pre-marital first sexual relationship. For each cluster-level aggregate variable, two levels (high and low) were chosen based on the mean of each variable in the total population. More specifically, the cluster-level aggregate variables were constructed based on: (1) mean education of the adult women living in the cluster (low level – less than 6 years – is the reference group); (2) percentage of Protestants living within the cluster (less than 18 percent in the cluster is the reference group); (3) percentage of women who do not attend religious services living in the cluster (less than 23 percent is the reference group).

6 – Method

This article uses an event history model to estimate the association between religious affiliation and religious attendance and the timing of premarital first sexual intercourse, when controlling for key covariates. It is important to note that a substantial number of adolescents had not experienced the event of interest (adolescent pre-marital sexual initiation) at the time the survey was conducted. Therefore, this sample is right censored.

In order to account for right censoring in the estimation of exposure time, it is employed the Cox proportional hazards model (Allison, 2005) that may be written as:

$$h_i(t) = h_0(t) \exp(\beta X_i)$$

Where $h_i(t)$ is the transition rate; $h_0(t)$ is the baseline rate, which is the hazard function for an individual with the value zero on all covariates; and β is the vector of parameters for the covariates (X_i) in the model. We estimate the hazard ratio of a young women having pre-marital first sexual intercourse during adolescence, when controlling for two main independent variables – religious denomination and attendance at religious service – as well as the other selected covariates. The hazard ratio is the probability of the event occurring in time t + 1, given survival to time t.

7 - Results

7.1 – Exploratory descriptive analysis

Table 1 displays the percentage of young women (15-24) by religious affiliation and religious service attendance in Brazil in 1986, 1996, and 2006. It shows that young women belonging to Protestant churches (including Pentecostals in 2006) attended religious services far more frequently than the most. For instance, in each survey 70 percent or more of Protestant girls went to church at least weekly, compared with a little more than 30 percent of Catholic young women. A religiosity divide clearly separates Protestants from other Brazilians.

Table 1 - Weighted percentage of religious affiliation by religious attendance among young women (15-24). Brazil, 1986, 1996, and 2006

Survey	Religious Affiliation	Religious Attendance			
		Weekly or more	Less than weekly	Less than monthly	Never
1986	Catholicism	33	31	11	25
	Protestantism	70	11	3	16
	Other religions	56	18	10	16
	No religions	0	0	0	100
1996	Catholicism	33	27	11	29
	Protestantism	76	12	4	8
	Other religions	63	20	3	14
	No religions	0	0	0	100
2006	Catholicism	31	21	30	18
	Traditional Protestantism	72	11	14	3
	Pentecostal	78	13	8	1
	Other religions	40	17	20	23
	No religions	5	4	20	71

Source: The 1986, 1996, and 2006 Brazil DHS.

Table 2 presents the percentage distribution of young women (15-24) in 1986, 1996, and 2006 by selected religious, demographic, socioeconomic, and community characteristics. Among other changes, Table 2 confirms that obvious progress has been made in the area of education in Brazil. For instance, the proportion of young women who had at least nine years of education rose from 30 percent in 1986 to 58 percent in 2006. At this year, on the other hand, the proportion of those with less than 5 years of education reached 8 percent, a level greatly lower than that observed in 1986.

It is also clear in Table 2 that the percentage of Catholic young women substantially declined in the last two decades in Brazil: although it remains high, this percentage dropped from 81 to 60 percent between 1986 and 2006. The concomitant growth of young women belonging to Protestant churches is also displayed in this table. Moreover, information on religious service attendance presented in Table 2 reveals a heterogeneous pattern, especially in 2006, when almost 40 percent of young girls reported attending religious services at least weekly, while 20 percent never attended them. The distribution of attendance at religious services, on the other hand, did not deeply change between 1986 and 1996, but it did between 1996 and 2006. For instance, the percentage of young girls who attended religious services less than monthly increased considerably (from 10 to 24 percent) over the last decades while the percentage of those who never go to church decreased.

Table 2 also displays the distribution of girls by the three cluster-level variables used in this study. First, it shows that the proportion of young women living in clusters where the mean education of adults is higher than 6 years increased from 39 to 81 percent between 1986 and 2006. With regard to religious community characteristics, it is noted that the proportion of girls living in clusters with more than 18 percent of Protestants has risen from 7 percent to almost 40 percent, while the proportion of those living in clusters with more than 23 percent of women who never attend religious services has decreased from 67 to 35 percent over this twenty-year period.

Table 2 - Weighted percentage of young women (15-24) by selected characteristics. Brazil, 1986, 1996, 2006.

Variables	1986	1996	2006
	(N=2,477)	(N=4,528)	(N=4,993)
Age			
15-19	53	56	50
20-24	47	44	50
Years of Education			
0-4	36	26	8
5-8	34	44	34
9 or over	30	30	58
Religious Affiliation			
Catholicism	81	78	60
Protestantism	8	13	24*
Other religions	2	2	4
No religions	9	7	12
Religious Attendance			
Never	31	30	20
Less than monthly	10	10	24
Less than weekly	26	23	17
Weekly or more	33	37	39
Residence			
Rural	25	19	18
Urban	75	81	82
Residence at childhood			
Small City	34	61	55
Big City/Capital	66	39	45
Regions			
Northeast	29	31	29
North	6	6	9
Southeast	31	40	42
South	19	15	13
Middle West	15	8	7
Watches TV weekly			
No	22	10	5
Yes	78	90	95
Household has toilet facility			
No	61	60	54
Yes	39	40	46
Cluster-level aggregate: education mean			
Low	61	49	19
High (more than 6 years of education)	39	51	81
Cluster-level aggregate:% of Protestants			
Low	93	79	60
High (more than 18% within the cluster)	7	22	40
Cluster-level aggregate:% of no attendance			
Low	33	35	65
High (more than 23% within the cluster)	67	65	35

Source: The 1986, 1996, and 2006 Brazil DHS.

* 14 percent are Pentecostals and 10 percent are traditional Protestants.

Next, Table 3 displays the percentage distribution of young women (15-24) who reported having had adolescent pre-marital first sexual intercourse by selected religious, demographic, socioeconomic, and community characteristics, separately for each survey. Table 3 confirms that the risk of exposure to pre-marital sexual activity tends to be associated with age. In 2006, for instance, 64 percent of girls between 20 and 24 years reported ever having had pre-marital sex before turning 20, while the proportion of those between 15 and 19 was 42 percent. Moreover, as can be seen in Table 3, the most educated young women (9 or more years of schooling) appear to be at reduced risk of pre-marital sexual intercourse than are those who are less educated (0-4 and 5-8 years of schooling) both in 1986 and 1996. In 2006, however, this relationship inverts, and young women with less education seem to be at lower risk. This finding is unexpected and is likely being confused by age effects.

Preliminary evidence in Table 3 points to religious affiliation and religious service attendance as among the variables that account for differentials in adolescent pre-marital sexual activity in Brazil. The difference between Catholics and Protestants in 1986 and 2006, nevertheless, were lower than in 1996. In general, Protestants and those who attended religious services at least monthly were less likely to report having had pre-marital sexual intercourse before the age of 20, compared to those who belonged to any other religious affiliations and attended religious service less frequently, respectively.

The influences of childhood and current residences indicate that young women who lived in big cities during their earliest ages and those who currently live in urban areas seems to be more likely of experiencing pre-marital sexual activity during adolescence than those who lived in small cities during their childhood and those who were currently living in rural areas. Table 3 also notes that who lived in Northeast Brazil in 1996 and 2006 are the least likely to report having had pre-marital sexual intercourse before the age of 20.

Regular television viewing and access to toilet facilities seem to be associated with the risk of pre-marital sexual intercourse in 1996 and 2006. Table 3 shows that young women who watched television in a regular basis presented a higher likelihood of experiencing pre-marital sexual as well as those who lived in household with toilet facility. Finally, the last line of table 3 confirms that the propensity for young women to engage in pre-marital first sexual intercourse before the age of 20 has substantially increased in Brazil, rising from 17 percent in 1986 to 53 percent in 2006.

Table 3 – Weighted percentage of young women (15-24) who reported having pre-marital first intercourse before age 20 by selected variables. Brazil, 1986, 1996, 2006.

Variables	1986	1996	2006
	(N=2,477)	(N=4,528)	(N=4,993)
Age	**	**	**
15-19	10	24	42
20-24	26	47	64
Years of Education	**		**
0-4	22	34	46
5-8	15	33	47
9 or over	12	31	57
Religious Affiliation	**	**	**
Catholicism	16	34	52
Protestantism	14	25	48
Other religions	21	40	60
No religions	26	39	61
Religious Attendance	**	**	**
Never	26	43	63
Less than monthly	21	40	56
Less than weekly	15	30	48
Weekly or more	9	25	47
Residence		**	**
Rural	14	26	41
Urban	18	35	55
Residence at childhood		**	**
Small City	14	31	48
Big City/Capital	18	37	59
Regions		**	**
Northeast	16	25	40
North	21	40	57
Southeast	19	36	58
South	18	37	57
Middle West	12	36	55
Watches TV weekly		**	**
No	18	28	40
Yes	17	34	53
Household has toilet facility		**	
No	18	31	50
Yes	16	36	55
Surveys	17	33	53

Source: The 1986, 1996 and 2006 Brazil DHS.
χ^2 (Chi-square) test: **p<0.05

7.2 – Multivariate Cox Proportional Hazard Models

Table 4 displays findings for multivariate Cox Proportional Hazard Models. This table presents four models (Model 4.1 – Model 4.4) showing the hazard ratios of a young

woman's having pre-marital first sexual intercourse during adolescence when controlling for religious affiliation and attendance at religious services as well as socioeconomic, demographic, and community variables. The first three models present the risk separately for 1986, 1996, and 2006. The fourth model (Model 4.4) also employs data from 2006; however, unlike in Model 4.3, Protestants are separated into traditional Protestants and Pentecostals[6].

In an attempt to avoid multicollinearity due the high correlation between religious denominations and attendance at religious service (as suggested in Table 1), we created eight mutually exclusive dichotomous variables representing combinations of the four religious affiliations with two different frequencies of attendance at religious service. Then, in order to facilitate the results' interpretation of them, the religious services attendance variable was re-categorized into two groups: (1) young women who attend religious services less than weekly and (2) those who attend weekly or more.

The new eight mutually exclusive dichotomous variables included in Table 4 are: (1) Catholics who go weekly or more to church, (2) Catholics who go less than weekly (the reference group), (3) Protestants who attend religious services weekly or more, (4) Protestants who attend them less than weekly, (5) Pentecostals who go to church weekly or more, (6) Pentecostals who go less than weekly, (7) People from other religions who go weekly or more to church and, (8) People from other religions that go less than weekly.

Table 4 reveals, at least, four main findings concerning the association between pre-marital first sexual intercourse during adolescence and the variables representing combinations between religious affiliation and attendance at religious service. First, Catholic young women who went to church weekly or more were at a lower statistical significant risk of engaging in adolescent pre-marital first sex than Catholics who attended less frequently. This is true for all the three surveys. Unfortunately, it is not possible to affirm (using the existing data) that Catholic girls who have attended religious services at a regular basis are those influenced by the Catholic charismatic wave. But one can assume that a considerable number of them belong to such a renewal movement, since charismatic Catholic girls usually attend religious services more regularly than traditional Catholics.

When religious affiliation is separately analyzed (model is not adjusted by religious attendance) in multivariate regressions, we observed that the hazard ratios of pre-marital sexual initiation during adolescence among Catholics is statistically significant higher than among young women who belonged to traditional Protestant in 1996 and Pentecostal churches and 2006 (results not shown). This article, therefore, makes clear the benefit in considering and examining attendance at religious services in studies on religion in Brazil. This is true because adolescents with greater religious commitment, even inside the same religious congregation, may be more apt to reproduce in their actions their religious values and teachings. Likewise, they may be more exposed to the indirect effects of religion suggested by Smith (2003). Then, assuming that attendance at religious services is one of many measures of religious commitment, it may help to differentiate adolescents that belong to the same religion.

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[6] The reason way these two religious groups were separated is because women affiliated to them may differently behave in terms of pre-marital sexuality. Unfortunately, data from the 1986 and 1996 DHS do not allow such desegregation.

Table 4 - Hazard ratios from the Cox proportional models showing the risk of young women' having pre-marital first intercourse before age 20 controlling for groups of religious affiliation and attendance and other selected variables. Brazil, 1986, 1996, 2006.

Variables	Model 4.1 1986	Model 4.2 1996	Model 4.3 2006	Model 4.4 2006 ^
	(N=2,477)	(N=4,528)	(N=4,993)	(N=4,993)
Age				
15-19	1.00	1.00	1.00	1.00
20-24	1.45***	1.16***	0.99	0.99
Years of Education				
0-4	1.00	1.00	1.00	1.00
5-8	0.57***	0.86**	0.77	0.75*
9 or over	0.34***	0.51***	0.54***	0.53***
Religious Affiliation by Attendance				
Catholics with low attendance	1.00	1.00	1.00	1.00
Catholics with high attendance	0.54***	0.77***	0.82**	0.82**
Pentecostals with low attendance				1.78**
Pentecostals with high attendance				0.50***
Traditional Protestants with low attendance	1.35	1.20	0.99	0.74
Traditional Protestants with high attendance	0.42**	0.45***	0.62***	0.75*
Other religions with low attendance	1.54	1.38	0.89	0.89
Other religions with high attendance	1.06	0.78	0.97	0.98
No religion	1.44**	1.05	1.08	1.09
Residence				
Rural	1.00	1.00	1.00	1.00
Urban	1.42	1.35**	1.34**	1.32**
Residence at childhood				
Small City	1.00	1.00	1.00	1.00
Big City/Capital	1.33	1.22**	1.16*	1.17**
Regions				
Northeast	1.00	1.00	1.00	1.00
North	1.52**	1.68***	1.72***	1.77***
Southeast	1.03	1.50***	1.47***	1.49***
South	1.45**	1.77***	1.56***	1.59***
Middle West	0.95	1.67***	1.44***	1.46***
Watches TV weekly				
No	1.00	1.00	1.00	1.00
Yes	0.94	1.13	1.31	1.31
Household has toilet facility				
No	1.00	1.00	1.00	1.00
Yes	0.82	1.00	0.86	0.88
Cluster-level aggregate: education mean				
Low	1.00	1.00	1.00	1.00
High (more than 6 years of education)	1.15	1.08	0.95	0.96
Cluster-level aggregate:> 18% of Protestants				
Low	1.00	1.00	1.00	1.00
High (more than 18% within the cluster)	0.90	1.02	1.21**	1.09
Cluster-level aggregate:> 23% of no attendance				
Low	1.00	1.00	1.00	1.00
High (more than 23% within the cluster)	1.45**	1.19**	1.20**	1.18**

Source: The 1986, 1996, and 2006 Brazil DHS. p * <0.1   **p<0.05   ***p<0.01
^ This model separates Protestants into traditional Protestants and Pentecostals.

Second, as would be expected, Protestants with high attendance were also at a lower statistical significant risk of engaging in pre-marital first sex during adolescence than Catholics who attended less frequently. This is true for all the three surveys too. Such a finding may indicate girls who go more often to church are less exposed to adolescent premarital sex. In fact, multivariate analyses show that high attendance at religious services has been associated with a reduced hazard ratio of pre-marital first sexual intercourse before age 20, regardless of religious affiliation (results not shown).

Third, a very interesting comparison can be made between Model 4.3 (that keeps all Protestants together in one category) and Model 4.4 (that separates Protestants into traditional Protestants and Pentecostals). As can be seen in Model 4.3, traditional Protestant young women who attended religious services weekly or more in 2006 did present a statistical significant lower risk of experiencing pre-marital first sexual intercourse during adolescence than Catholics with low frequency at religious services. However, Model 4.4 shows that Pentecostals with high attendance keep their strong association with pre-marital sexual intercourse, while traditional Protestants lose a lot of their statistical significant association. In fact, when Pentecostal young women are separately examined, they presented the lowest (and statistically significant, $p<0.01$) risk of having pre-marital first sexual intercourse before age 20.

As suggested before, it is important to highlight that because of the cross-sectional nature of the data is not possible to define the causality direction. That is to say, results from Model 4.4 may indicate that Pentecostal churches have been more effective at delaying or inhibiting adolescent pre-marital sexual debut than Catholic congregations. On the other hand, it can also suggest that these churches impose several punishments to their followers, forcing young women to leave the church whether they disobey religious teachings on pre-marital sexual behavior.

Fourth, Model 4.4 also shows that in Pentecostals with low attendance presented a substantial higher risk of having pre-marital first sex than Catholics who attended religious services at the same basis. Such a finding is unexpected since the research that has been conducted has pointed to Pentecostal Protestant churches as those that are successfully helping adolescent and young women to avoid or postpone sexual intercourse and childbearing in Brazil (Verona and Regnerus, 2009; McKinnon, Potter and Garrard-Burnett, 2008). This religious influence may potentially happen because Pentecostal churches encourage girls to attend religious services regularly. Consequently, these girls may be more exposed to the types of indirect influence of religion as outlined by Smith (2003). Otherwise, Pentecostal girls who rarely attend religious services are likely not exposed to such effects.

Other interesting results concerning Table 4 are briefly mentioned. Even after controlling for socioeconomic, demographic, and community variables, those young women with no religious affiliation were far more likely to engage in pre-marital sexual initiation than were Catholics in 1986. This association, however, lost its statistical significance in 1996 and 2006.

Not surprisingly, education is found to have a statistically significant association with pre-marital sexual initiation during adolescence in Brazil. In each survey, girls with at least nine years of education were significantly at a lower risk of pre-marital sexual initiation before age 20 relative to those with four years of schooling at most, all else being equal. Table 4 also shows that although the hazard ratios are not statistically significant, in 1986 and 1996, young women living in clusters of higher education mean (more than 6

years) experienced a higher chance of pre-marital adolescent first sex, whereas in 2006 the opposite was true.

Young girls living in clusters with a higher percentage (more than 18 percent) of Protestants in 2006 were at higher statistically significant risk of engaging in pre-marital adolescent sexual intercourse than those living in clusters with a lower percentage. Table 4 also includes the cluster variable accounting for the proportion of women who never attend religious services. Results from all the surveys show that girls living in clusters with a higher percentage of women who never go to church were at higher risk of engaging in pre-marital sexual intercourse during adolescence. This is observed in all the three surveys.

Lastly, it is important to highlight that other factors may be at work in the apparent association between religious involvement and pre-marital adolescent first sex presented in this study. Selectivity is one alternative explanation. Findings of this work, even controlling for socioeconomic, demographic, and community variables, reveal that the hazard ratios for combinations between religious denominations and religious service attendance are still statistically significant, suggesting that selectivity does not likely play a pivotal role here. The other two alternative explanations, reverse causation and social desirability bias, cannot be evaluated using the existing data. However, it is possible that Pentecostals and charismatic Catholics—for whom pre-marital sex is a more serious violation of norms than for most other Christian groups—suffer from greater social desirability bias with both sex and religiosity questions. If so, the coefficients reported here may be overestimated. These girls may have more interest in presenting themselves in a manner that will be viewed favorably by others. Consequently, they may find themselves embarrassed and may lie about their sexual behavior. However, should this bias exist, it would not likely account for the entire difference observed among them and Catholic girls who do not attend religious services.

8 – Discussion

Increasing adolescent fertility and declining age at first sexual intercourse have been accompanied by a transformation in Brazil's religious landscape, which has been marked by the significant growth Pentecostalism and the very popular movement of Catholic Charismatic Renewal. In this article, we examined whether one of the most proximate determinants of fertility—age at first sex—is associated with the membership with religious affiliation and religious service attendance in Brazil. More specifically, we investigated trends and differentials in this associations drawing in successive Brazil Demographic and Health Surveys.

Our results confirm the increasing proportion of young women having adolescent pre-marital first sexual intercourse over the last two decades in Brazil. They also show a direct association between pre-marital sexual debut during adolescence and variables representing combinations between religious affiliation and attendance at religious services in the three DHS examined. In addition, this article makes clear the importance in considering and examining attendance at religious services in studies of religions in Brazil, and not only religious affiliations.

Following the integrated account of religion's constructive influence in the lives of American adolescents of Smith (2003), this study suggests several sources of indirect influences of religion. Some of them include the increase of cultural and social capital, and leadership and coping skills. As pointed out by other authors, such factors, through which

religion can affect their follower's lives, can very often be observed in the Brazilian religious environment, especially within Protestant churches and Charismatic Catholic communities (Cleary, 2007; Rohden et al. 2005; Chesnut, 1997; Mariz, 1994).

One source of indirect influence of religion on adolescents' lives is the achievement of cultural capital. As pointed out by Mariz (1994) and Burdick (1993), unlike to traditional Catholics, Pentecostals have long been recognized in Brazil for their religious knowledge. They highlight, for instance, the importance of reading the Bible and knowing its contents well. Pentecostal Protestants churches in Brazil also provide youth with substantial musical education through participation in choirs and choruses, and opportunities to play musical instruments for worship (Mariz, 1994). The stimulus for reading, speaking, forming opinion, and playing musical instruments may encourage Pentecostals to become literate and develop skills that can be useful for other aspects in their lives. They may, for instance, find themselves as talented adolescents, and have higher educational and professional aspirations. Consequently, they may want to avoid or postpone certain sexual or reproductive outcomes, such as premarital sex or childbearing, which could move them away from better life opportunities.

As suggested earlier in this article, religious involvement may also provide adolescents with leadership skills and social ties that affect opportunities and constrains that they may face (Smith, 2003). Cleary (2007) and Mariz (1994) argued that because charismatic Catholic communities and Pentecostal churches in Brazil very often consist of independent small groups, ordinary people may have ample opportunity to develop those skills that can increase youth capacities and confidence, which can enhance their well-being and life chances. Moreover, these religious groups are recognized by promoting self-help networks that are national in scope. They usually offer not only psychological and spiritual support, but also financial, opening their homes to people in need, trying to help others to find jobs, or even offering child help support (Chesnut, 2003; Mariz, 1994; Burdick, 1993). To some degree, these social ties may affect the use of time by young people, encouraging them to look for a (better) job or study harder at school, for instance. These connections, based on religious environment, can also expand youth's aspirations, encouraging their development and maturity, and restrict their free time, which may indirectly affect their sexual and reproductive behavior as well. In addition, these networks of relational ties may affect adolescents' attitudes by enabling parents and older religiously involved people to supervise and pay closer attention to them (Smith, 2003). Regarding this supervision, Burdick (1993) observed that Pentecostal parents, for instance, maintain strict authority over their daughters' relations with men in Brazil. They very often disapprove of extended courtships and marriage to non-*crentes* [7].

In conclusion, this research should encourage future studies on religion or religious involvement and sexual and reproductive outcomes in Brazil. As noted earlier in this article, this topic deserves further consideration from Brazilian demographers not only because this country has experienced tremendous change in its religious landscape over the last decades, but also because religion is a primary socialization agent and sexual activity is a sphere of human behavior considered high in religious applicability (Regnerus, 2007). Research on the association between religion and pre-marital sexual initiation, and other elements of public health in Brazil, such as adolescent fertility, family arrangements, use of

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[7] *Crente* means believer, and it is a name popularly given to adepts of Protestant churches.

contraception, abortion, gender inequalities, and domestic violence are only some examples concerning how the study of religion may contribute to a better understanding of demographic phenomena in this country.

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