# Mass Media and Individual Reproductive Behavior in Northeastern Brazil

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## ABSTRACT

Mass media in general, and electronic media in particular, have been suggested to have powerful fertility-limiting effects in many regions of the world. In most regions where mass media are thought to have affected reproductive behavior, these media have been intentionally used to influence the behavior of their audiences, inundating consumers of these media with advertisements and other messages that promote family planning practices. In Brazil, however, the electronic media historically have not been used to promote a family planning ideology or to intentionally affect individual reproductive behavior. Hence the effects of these media on reproductive behavior in Brazil are unplanned and unintentional.

This paper presents results from a microdemographic community study in northeastern Brazil designed to determine whether exposure to mass media early in the life course is linked to higher rates of contraceptive adoption and lower numbers of births at specified ages. Using evidence from qualitative data collected at the field sites, this paper also explores possible mechanisms through which mass media may be influencing reproductive behavior in the absence of overt fertility-limiting messages.

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## FERTILITY DECLINE

One of the most dramatic changes in population patterns observed in recent decades is the rapid decline in fertility rates in a variety of settings and among diverse groups of peoples. Throughout the world, lower fertility levels have been most consistently correlated with increases in educational levels (Cleland 1985, Cleland and Rodríguez 1988, Singh and Casterline 1985), and particularly with increases in the education of women (Lam, *et al.* 1993, LeVine *et al.* 1991, Martin and Juarez 1994, Mboup and Saha 1998, Muhuri *et al.* 1994 ) and the attainment of higher levels of education by their children (Axinn 1993, Caldwell *et al.* 1985), although critiques of the fertility/education link have also begun to appear (see Bledsoe *et al.* 1999) . Other associations between socio-economic factors and declining fertility have also been noted. Among these are higher income levels (Daly 1985, Mueler 1984), urban residence (Bogin 1988, Lee and Pol 1993, Mboup and Saha 1998, Muhuri *et al.* 1994, Yi and Vaupel 1989), and the availability of modern contraceptives (Alba and Potter 1986, Merrick and Berquo 1983, Tsui 1985). More ambiguous relationships have been noted between women's employment status and fertility decline (Standing 1983, United Nations 1985, Weller 1984), suggesting a link between increases in the status of women and declining fertility levels.

Some researchers, in attempting to untangle the complex web of factors surrounding changes in fertility levels, have focused on economic variables, asserting that changes in modes of production (from a family mode of production to a more industrial mode of production), together with increased educational investment in children and increased monetization of local economies, have shifted the cost/benefit balance of children. Because of this shift, the wealth generated over an individual life span no longer "flows" upward from children to parents (and grandparents), but rather flows downward from parents to their children, causing children to become a net economic loss to their parents under conditions of rapid economic development (Caldwell 1982). Further, women, who often are the primary caregivers of their young children, pay an additional opportunity cost by engaging in child care instead of wage labor (Cleland 1985, Cleland and Wilson 1987, Lee and Bulatao 1983). Sensitive to the economic costs of adding more children to the family, parents thus limit their marital fertility.

Others have focused less on the economics of fertility and more on the societal influences, noting the impact of value shifts on overall fertility. For example, Lesthaeghe and Surkyn (1988) point to changes in the values held by the parents of the "baby boom" generation, and suggest that by not transmitting the cultural ideals of older generations, these parents may have initiated the value shift responsible for the "baby bust" of subsequent generations. In a similar vein, Rosero-Bixby and Casterline (1993) have focused on the cultural factors that affect fertility levels, suggesting that the norms set by the elite of society diffuse by imitation to other segments of the population. They see the spread of contraceptive use as a form of "contagion," where every new "case" of contraceptive use makes it more likely that contracepting behavior will be imitated by others throughout the area until community norms have shifted to accommodate fertility-limiting behavior (Rosero-Bixby and Casterline 1993). Caldwell (1982) and Nag (1980) have postulated that this imitation process occurs between societies as well, particularly among residents of less industrialized nations who look toward the urbanized and industrialized world for patterns of elite behavior. Caldwell suggests that because Western values are so readily emulated by members of many industrializing nations, the small nuclear families typical of Europe and North America are likely to be imitated in other locales (where this family pattern may not have been the norm) through the adoption of overt fertility limiting practices. This fertility limiting effect of "Westernization" manifests itself through two main channels: mass education and mass media (Caldwell 1982).

Education is seen as a powerful force against high fertility, because of its economic and ideational consequences. On the economic side, educating children is costly, even where schools are "free," because parents must provide books, supplies, appropriate clothing, and frequently transportation, in order for their children to attend school. Schooling also removes children from participating in the traditional household economy, thereby making children a net cost for a longer period of their pre-adult lives, and encouraging parents to invest in fewer children. Once this investment has been made and the children reach adulthood, those with higher education—and especially women with at least a primary school education—often have fewer children, in part because of the cost of educating children, and in part because of the opportunity cost of raising children as opposed to engaging in wage labor. In addition to the economic effects of education, Caldwell also notes that education often imparts Euro/American ideals to young pupils since schools in many industrializing nations closely follow the Euro/North American

model of education in which high esteem is given to values such as the nuclear family, the accumulation of material goods, and the valorization of the individual over the family (Caldwell 1982).

Mass media can have similar influences, through the transmission of programs and information promoting the values of the industrialized and urbanized world (Caldwell 1982, Reed *et al.* 1999). In addition, because television programs and the values they encompass are transmitted directly into the home, television, unlike education, has the potential of directly affecting every member of the household, even those with little or no schooling. Also unlike education, television viewing does not involve the expenditure of substantial sums of money. Aside from the initial expense of purchasing a television set, there is little cost involved in watching TV.

Several researchers have suggested a link between mass media and ideational change at the community level. Lee and Bulatao (1983) suggest that material aspirations, which are not easily satisfied, may nonetheless be aroused by the influence of the mass media in less industrialized nations. Cleland adds that the growth of communication media, together with economic development "bring new opportunities, goods, and services, which may affect tastes and aspirations more rapidly" (Cleland 1985: 226). Likewise Faria and Potter (1994) suggest that Brazilian television draws viewers into a consumer economy, encouraging the consumption of goods shown on popular *telenovelas.* This increased appetite for consumer goods, along with the effect of increased opportunities brought about by the educational system, may lead parents to invest in fewer (but higher "quality") children (Cleland 1985).

The role of mass media in changing both patterns of contraceptive use and notions of ideal family size has been investigated empirically in South Asia (Saksena and Rastogi 1989), Africa (Bankole 1994, Kojima 1993, Piotrow *et al.* 1992, Westoff and Rodrígues 1995) and Latin America (Bailey 1973, Bertrand *et al.* 1982, Korzenny *et al*. 1983, Valente and Saba 1998), where government and private agencies have promoted family planning services through radio, television, and the print media. Westoff (1994) has also explored the role of the media (radio and television) in affecting contraceptive practice and desired family size, without focusing on specific media content or overt family planning messages. Using cross-sectional data from three continents, he finds that listening to the radio and watching TV—regardless of

program content—is consistently associated with a higher incidence of contraceptive use and greater desires for smaller family sizes.

In Brazil, where electronic media historically have not been used to promote family planning, researchers have focused on television exposure and its potential link to fertility decline. On a regional level, the spread of television in Brazil has been shown to correspond to declines in fertility levels in both the Northeast and the Southeast (Potter *et al.* 1998). At the individual level, lower fertility levels have been associated with exposure to television in various sites throughout Brazil (Kottak 1990b). Since neither the Brazilian government nor the television networks have historically used television to convey to the mostly Catholic audiences overt messages about family planning services, lower overall fertility among those exposed to television is seen as an unintended consequence of the spread of this medium (Faria and Potter 1994, Kottak 1990b).

## MEDIA AND FERTILITY IN BRAZIL

An enormous country in both population and geographic size, Brazil has in the past several decades undergone rapid changes in fertility patterns. From 1960 to 1984 Brazil's total fertility rate dropped from 6.28 to 3.53 births per woman (Silva, *et al.* 1990). Although this decrease has not occurred evenly throughout Brazil, the fertility rates in all regions of Brazil have been declining consistently since at least 1970 (De Carvalho and Wong 1996, IBGE 1990, Merrick and Berquo 1983). In 1996 the total fertility rate was estimated at 2.5 for the country as a whole (BEMFAM 1997). In the arid northeastern portion of the country, the region of earliest European settlement and perhaps the most rural area of the nation, fertility declines have been equally dramatic, dropping from a rate of 7.50 in 1950 to 4.96 in 1984 (Silva, *et al.* 1990). By 1991 the total fertility rate in the Northeast was 3.7, with rates in urban areas of the Northeast reaching 2.8 births per woman, and rates in rural areas being 5.2 births per woman (BEMFAM 1992). Although much of the decrease in fertility levels in this region of Brazil may be attributed to knowledge and availability of modern contraceptive technology (BEMFAM 1992, Martine 1996), the rapid fertility decline in Brazil has occurred despite wide fluctuations in the economic health of the country, an economy that has witnessed extremes such as the "Economic Miracle"

of the early 1970s, and the hyper-inflation of the 1980s (De Carvalho and Wong 1996, Lam *et al.* 1993). However, the declining fertility rate has closely paralleled the introduction and expansion of television in time and space (Faria and Potter 1994, Potter *et al*. 1998), suggesting a causal link between the spread of mass media and fertility decline in Brazil.

The focus on television's impact on fertility in Brazil stems in large part from the preeminence of television as a medium of mass communication in Brazil. Since it first became available in Brazil in 1950, television has spread continuously to all regions of the country (Kottak 1990a, b), so that by 1996 it was estimated that 76% of urban households and 35% of rural households owned televisions sets (BEMFAM 1997). Although some regions of the country still have little exposure to television, the current Brazilian viewers represent the fourth largest TV audience in the world (Faria and Potter 1994), with 93% of the urban population and 69% of the rural population watching TV at least once per week (BEMFAM 1997).

In a culture more attuned to oral than written communication, television plays a central role in the daily lives of those with access to it. Brazil's largest and most successful network, Rede Globo (Globe Network), is the most regularly watched commercial television network in the world, and a decade ago it routinely attracted audiences of 60-80 million viewers with its own nightly news and *telenovela* productions. The supremacy of the network is due in large part to the high quality *novelas* that Globo produces on a continual basis. Globo's *novelas* not only have become the most popular programs on Brazilian evening TV, but are exported to foreign markets as well. These *novelas,* which capture 60-95% of the audience share throughout Brazil, are written, filmed, and produced in Brazil, and focus on such typical Brazilian themes as family relationships, the urban lifestyle, social status, and upward mobility, giving them an appeal among Brazilian audiences unparalleled by other programming. (Faria and Potter 1994, Kottak 1990a, b; Vink 1988).

On the Globo network three different *novelas* are shown each evening and are known as the 6:00, 7:00, and 8:00 *novelas*, although their actual starting times are approximately 6:10, 6:55, and 8:25. Each *novela* time slot has its own "flavor," with the earliest *novela* often centering around rural themes, the 7:00 *novela* aimed more at adolescents and women, and the 8:00 *novela* focusing principally on sophisticated urbanites. Between the most popular time slots (the 7:00 and 8:00 *novelas*) Globo broadcasts its evening national news, the "Jornal Nacional." To maintain audience interest in the evening *novelas*, particularly during the first several weeks

of a new *novela* when the intricate plot is laid out, Globo staggers the beginning and ending dates of the three evening *novelas* so that at any one time viewers are in the "middle" of at least one *novela* (Kottak 1990a).

While in many parts of the world television viewing decreases with increased educational attainment, in Brazil the reverse is true. As demonstrated by recent demographic surveys in Brazil the percentage of women aged 15-49 who watched TV at least once per week was greatest for women with the highest reported levels of education (BEMFAM 1992, 1997). In the Northeast, only 40% of women with no formal education watched TV at least once per week, while 59% of those with 1-3 years watch television on a weekly basis. At higher levels of education the percentages of women watching television at least once per week in the Northeast rises to 87% of those with 5-8 years of schooling, and 95% for women with 9 or more years of schooling (BEMFAM 1992:63)[1]. Kottak (1990a, 1991), in a study that examined of the effects of media on Brazilian society, found that television viewing levels (average number of hours viewed per day) among residents of various communities was positively correlated with both literacy and the number of books, magazines, and newspapers in the home, all of which are also connected to higher levels of education. Faria and Potter (1994) also note that television viewing patterns vary little by social strata. Thus, except for differences due to availability, television in Brazil is a medium in which all social, economic, and educational classes participate.

While television viewing is an important part of the cultural context of Brazilian daily life, listening to the radio is an activity that is also engaged in by high percentages of the population, particularly in rural areas where household ownership of television sets is limited. In the Northeast, radio listening is more prevalent than television viewing, with 70% of the women aged 15-49 watching TV at least once per week and 79% of the these same women listening to the radio at least once per week (BEMFAM 1992). Although in the Northeast the urban/rural differential for television viewing is particularly high, this differential is markedly less for radio listening. In Brazil's Northeast 86% of urban women of reproductive age watch TV at least once per week, and 41% do so in rural areas[2]. By contrast 82% of urban women and 74% of rural women listen to the radio at least weekly (BEMFAM 1992). These data suggest that in Brazil's Northeast, radio, because it is more accessible to rural women than is television, may be an important source of information and contact with the larger society.

As is the case with television viewing, radio listening in Brazil also increases with increased educational levels. Thus in the Northeast the percentage of women with no formal schooling who listened to the radio at least once per week was 62%, while 80% of women with 1-3 years of schooling and 86% of those with 5-8 years of education listened to the radio at least once per week. Of the women with 9 or more years of schooling 86% also listened to the radio on a weekly basis (BEMFAM 1992). Because of its accessibility and acceptance by individuals at all educational levels, the role of radio—like the role of television—in influencing reproductive behavior should not be overlooked.

## RESEARCH SETTING

In order to determine whether individual exposure to electronic mass media affects demographic behavior, I undertook a microdemographic community study in northeastern Brazil, obtaining detailed reproductive histories from 170 women aged 15 and above, as well as information about these women's family histories, educational backgrounds, and residential patterns. The research was conducted in two communities in northern Bahia, near the capital city of Salvador.

Arembepe, a coastal town of approximately 5,000 year-round residents at the time of the research in 1996/97, was the main community of research, as well as the location where I resided throughout the fieldwork. This small town has undergone dramatic changes in the past 40 years, having evolved from a fairly isolated fishing community of a few hundred residents in the 1960s to a large community of native sons and daughters whose numbers are supplemented by migrants from other rural areas and small towns, as well by migrants from large urban centers who have chosen to live in a smaller community. In the summer months the population of Arembepe swells as visitors from Salvador and elsewhere flock to the community to enjoy the beach and the many restaurants in the town, repeating the pattern of the late 1960s and early 1970s when "hippies" from various parts of Brazil, the U.S., and Europe moved to this and other coastal communities in the region in search of a "pristine" environment where residents were perceived as living close to nature (Kottak 1992).

In the decades following the 1960s, the palm-thatched wattle-and-daub (*taipa*) homes of Arembepe (Kottak 1992) gave way to brick and tile structures, which have now become so numerous and closely spaced that many residents are adding second and third stories to their homes in order to provide housing for extended family members, or to generate rental income during the summer months when tourists seek accommodations in this beachfront community. Besides growing in population and housing units, the community also gained various amenities in the past 30 years, with a road and a nearby factory arriving in the early 1970s, electricity reaching the community in 1976, a junior high school being placed in the community in the 1980s (Kottak 1992), a new high school being added in the early 1990s, and pipes for municipal water service being laid in the late 1990s. Most of the streets in the community are now paved, and there is regular bus service to Salvador and other nearby communities throughout the day. In addition, Arembepe receives daily municipal garbage service, and has fairly reliable telephone service (including private telephone lines, public pay phones, and cellular phone service). In the late 1990s the community contained many small grocery stores, butcher shops, and bakeries; a pharmacy; a branch of a large regional bank; a number of hotels and guesthouses of varying sizes; dozens of restaurants, snack shops and bars; several construction material stores; a health center (which was minimally staffed during the fieldwork); two Catholic churches (administered by a priest who resides in a nearby community); several Protestant churches and meeting houses; and a variety of other services including a dental office, a veterinarian office, several mechanical and electrical repair shops, and some specialty shops. Many year-round residents also owned cars and telephones, and above the rooftops of numerous homes the "common" television antennas (*antena comun*) were being replaced with enormous satellite dishes.

Inside the home, most Arembepe residents had at least one television set (usually a color TV), one or more radios or stereos, a bottled gas stove, an electric refrigerator, a suite of furniture, and a plumbed bathroom, although nearly all of the clothes washing for the community was still done by hand at the freshwater lagoon, with the women of the household (or other paid laundresses) performing this task for the household. The number, type, and quality of furnishings and other goods inside the homes of Arembepeiros varied considerably from home to home and, along with other consumption patterns, reflected the general wealth of these households.

Although many Arembepe residents still make their living catching or selling fish in the community and beyond, most of the residents today do not earn their living from fishing. Instead, residents for the most part rely for income on: 1) tourism and its associated businesses (including seasonal and year-round jobs in the retail, restaurant, and lodging sectors, and temporary employment as cooks, housecleaners, and builders for summer residents), 2) municipal jobs (including some in Arembepe itself, such as positions in the school, in the health center, or in the sanitation service), or 3) jobs outside the community to which residents "commute" by bus or car. Some residents commented that as transportation to Salvador became easier, and as more and more amenities reached Arembepe, the community was becoming nearly a suburb of Salvador.

By contrast, the nearby community of Coqueiros has a resident population of around 600 people, and lacks the bustle and many of the amenities of Arembepe. Until the mid 1980s, when a bridge was built across a large river that drains into the Atlantic, Coqueiros was accessible from Arembepe and other coastal communities only by canoe, although Coqueiros residents could travel to the municipal seat (Camaçari) via an inland road. In the mid 1980s the community was also electrified, but some of the outlying homes have only recently been connected to electric service. Although the hilly terrain and the dirt roads in Coqueiros makes access into the community by bus (and car) difficult, at the time of the research at least one bus company passed along the southern edge of the community, providing public transportation between Coqueiros and other nearby communities.

In Coqueiros the roughly 120 homes are widely spaced along several unpaved roads, with small agricultural plots and grazing lands interspersed between clusters of homes. Several large farms (some belonging to urban "gentleman farmers") surround the community, and some residents are employed as laborers and cooks on these farms. Although many households in Coqueiros are involved in small scale agriculture (either for household consumption or for sale in local markets), most household visited had at least one member who worked for wages within or outside the community.

Coqueiros households had less income than the average household in Arembepe, and the contents and structures of the homes in this community reflected the lower incomes of these residents. While in Arembepe *taipa* houses were rare, in Coqueiros they were commonplace. Most Coqueiros homes also contained fewer material possession than typical Arembepe homes,

although even in Coqueiros most homes contained at least a black-and-white television, a small radio, and a bottled gas stove. Color televisions, stereos, and refrigerators were more rare in Coqueiros than in the relatively more affluent community of Arembepe.

In addition to the handful of stores and bars that are scattered throughout the community, Coqueiros has two churches (one Catholic and one Assembly of God), and a municipal elementary school attended by local children. Children who continue their schooling beyond the primary grades must travel the 4 Km to Arembepe to attend the secondary school, and many children who do so catch rides on the local buses that travel along the coastal highway between Arembepe and Salvador. Adult residents also frequently travel to Arembepe and other nearby communities to work or sell their produce, to purchase supplies, or to visit relatives.

Although Arembepe and Coqueiros were electrified in different decades, at the time of the research both communities had almost universal exposure to electronic media, with most homes generally having at least one radio and television set, although in poorer homes these sets may have been recently acquired, or in some cases were broken and in need of repair. Because television viewing in the field sites rarely is done in isolation, television sets were generally placed in the main (living) room of the house where all household members, as well as visitors, could watch the programs. In most households the television was generally turned on in the late afternoon (if not sooner) so that one or more household members could watch the evening news and/or one or more of the three nightly *novelas*. Although men in the field sites often downplayed the importance of the *novelas* in their everyday lives, men as well as women were often seen watching *novelas* in the evening hours of relaxation. Some households also kept the television set on during other times of the day (e.g. in the morning when cartoons entertained children before school, or in the afternoon when films and re-runs of classic *novelas* were aired), and in many homes radios were turned on during the morning and early afternoon hours. Unlike televisions, radios were also kept in more private areas of some homes, where individual household members sometimes listened to the radio during the day (and sometimes all night) in their rooms alone.

Although nearly all households participated in the electronic media at the time of the research, individuals within and between households varied considerably in their exposure to television and radio earlier in life. Many of the older individuals in the communities—especially if they had resided in isolated non-electrified communities during the early periods of their

lives—had not been exposed to television broadcasts until their thirties, and some had not been exposed to radio until their teens or twenties. In addition, some of the younger residents who had grown up in very poor households and/or in isolated communities had not been exposed to electronic media until their teens or early twenties. The variation in individual exposure to mass media, as well as variation in other factors such s education, contraceptive use, and number of births, which are discussed below, permitted the effect of media exposure on later reproductive behavior to be analyzed.

## DATA COLLECTION

Because this study was aimed at determining whether media exposure during the life course influenced later reproductive behavior, the data collection for this project focused on systematically obtaining data from a relatively large number of women. The principal data collected consisted of questionnaire responses that could be coded for quantitative analysis. Other data—including data gleaned from observations of everyday community lifeand from informal conversations with a variety of individuals in each of the communities—were also obtained throughout the fieldwork. These qualitative data heavily inform the analysis of quantitative data and the interpretation of the results obtained from these analyses.

In order to gain a broad understanding of the numerous households in the communities, a representative survey of households was first conducted in each of the communities of study. In this initial survey I gathered information about the identity of each household member, along with basic information about each individual in the household (information such as date of birth, birthplace, educational attainment, religion, marriage history, number of pregnancies [for adult women], and income), as reported by one of the household members. Information about household amenities (appliances, size of house, etc.) were also gathered, along with information about household consumption of electronic and print media. In Arembepe every 10th occupied household was visited in this first round of surveys, while in the smaller community of Coqueiros every 4th household was visited. Data from a total of 133 households in Arembepe and 27 households in Coqueiros was obtained. In these 133 Arembepe households resided 671 individuals, including 251 women aged fifteen and above; in the 27 households visited in

Coqueiros resided 145 persons, including 50 women aged fifteen and above. From the separate pools of women aged 15 and above, random samples were drawn for the second phase of surveys, which focused on the life histories and current attitudes of individual women.

A total of 170 randomly selected women (142 from Arembepe and 28 from Coqueiros) were interviewed by myself and several research assistants in the second phase of the survey using pre-printed questionnaires[3]. In these face-to-face interviews women were asked about their family backgrounds, their residential histories, their educational attainment at various ages, their religious affiliation and attendance at religious services throughout the life course, their marriage and cohabitation histories, their previous and current contraceptive use, the number of pregnancies they experienced (and the outcome of each pregnancy), and their media consumption patterns throughout the life course. Women were also asked about their current attitudes about children and family, the community, and electronic media. These interviews not only generated data that were later used in quantitative analyses, but they also elicited a variety of comments and discussions about issues relating to everyday life in the communities, and, among some informants, about the vast social changes many of the women had experienced over their lifetimes. In addition, the insights of the Brazilian and American research assistants on this project, my own observations of community life, and extensive conversations with community residents—including both men and women, native-born community members and migrants to the area, long-term residents and recent arrivals, highly educated individuals and those with minimal formal education, well-off and poor individuals—comprise an important component of the data obtained for this project.

## ANALYSIS AND RESULTS

### Analytical Methodology

In order to assess the impact of media exposure on individual reproductive behavior, a life history approach (Elder 1977) was used to examine the impact of early life events on later reproductive behavior. Here both the timing of first contraceptive use and the number of live births at age 35 are examined.

For the analysis of the timing of first contraceptive use one would ideally examine the timing of such use relative to the timing of first sexual activity. Unfortunately, however, the timing of first sexual activity was not systematically obtained in this study, although each woman's age at the time of her first marriage[4] and at the time of her first contraceptive use were gathered. In order to overcome this lack of information about the timing of first sexual activity, the analyses of the timing of first contraceptive use are performed with ever-married women, under the assumption that at least by the time of marriage women are sexually active.

Of the 170 randomly selected women interviewed, 109 were or had been married at some point in their lives. After removing cases which had some missing or incomplete data, and further eliminating the handful of women who prior to age 15 were not Catholic—allowing subsequent analyses to control for religion—there remained 86 women. (Descriptive data for these 86 cases are shown below.) To further simplify the analysis of the timing of first contraceptive use, only women who had not used contraception prior to marriage are included, thereby permitting an analysis of the impact of various early-life events on the timing (number of years since marriage) of first contraception, whether the first contraceptive used was reversible (pill, condom, injection, IUD) or permanent (tubal ligation or vasectomy of the partner). A total of 72 cases of ever-married women[5] who had not contracepted prior to marriage, who had no missing data, and who were Catholic prior to age 15 were used in the analyses that follow.

The analysis of the timing of first contraceptive use utilizes hazard analysis (or event history analysis), which models the "hazard rate" of events occurring among individuals who are "at risk" of experiencing that event (Allison 1984)[6]. In hazard analyses the dependent variable is not whether or not an event occurred of the number of times it occurred; rather, it is the time between events of interest (e.g. time from marriage to first contraception). In these analyses the coefficients for each independent variable correspond to the relative increase or decrease in the overall rate due to that independent variable.

For the analysis of number of live births experienced by age 35, ordinary least squares regressions are used to model the total number of live births experienced by each woman who had attained the age of 35. These total births are modeled versus early life experiences thought to influence the reproductive behavior of women of various cohorts, yielding regression coefficients that correspond to the relative increase or decrease in the dependent variable (total number of births) for every incremental change in the value of an independent variable.

Although limiting these analyses to women who were above the age of 34 at the time of the study necessarily limits the sample size to a fraction of the women in the original study, such analyses provide results for comparable life stages of women in various cohorts. A total of 54 ever-married women aged 35 and above, who have no missing data and who were Catholic before age 15, are used in the analyses of the number of births women had by age 35

## Variables Included in the Analyses

As expected, the reproductive behavior of women in the communities has changed dramatically in recent decades, with younger women both adopting contraception at younger ages, and experiencing fewer births in adulthood than older women had (see below). For the analyses that follow the birth cohorts of women in the study are used as one of the major explanatory variables of changing reproductive behavior. Since birth cohort captures not only the ages of women at the time of the study but also the historical period in which they grew up, birth cohort encompasses some of the social change experienced by women in the study, including, but not limited to, greater access to contraception in recent decades.

For these analyses, the birth cohorts were constructed using events of social significance in the main community of study (Arembepe). The oldest cohort, those born before 1953 would have turned 15 in 1967 or earlier. If they had been living in Arembepe at that time they would have turned 15 prior to the bulk of the "hippie invasion" that became significant beginning in 1968 (Kottak 1992). By contrast, the next cohort, those born from 1953 to 1962, would have turned 15 in the decade 1968-1977, a decade of major change in Arembepe, beginning with the influx of large numbers of "hippies" from southern Brazil and overseas, and ending with the electrification of Arembepe. The final cohort, those born in 1963 or later, would have turned 15 in 1978 or later. The women in this cohort, if they had grown up in Arembepe, would have lived in an electrified community prior to age 15, and would have witnessed other major developments in the community in their youth. These birth cohorts, then, capture periods of locally important social change, as well as accounting for differences in the chronological ages of the women in the study.

Because the two communities of study differed in many ways—including in their size, in the services and amenities available in each community, and in their relative isolation in past

decades—community of residence is included in the analyses of contraceptive use and total births by age 35. As indicated earlier, religious affiliation is also controlled for in the analyses by limiting the sample to women who reported being Catholic during their childhood and adolescence. Since only a few women in the study reported having a religious affiliation other than Catholic prior to age 15, these few individuals were dropped from the final analyses reported here.

Because events that occur early in the life course are believed to influence later behavior, and because among some women the reproductive events of interest (first contraceptive use and childbearing) occurred in their mid- to late-teens, only life history events that occurred prior to age 15 are used as explanatory variables in the analyses that follow. These variables include educational attainment, urban residence, and media exposure, all of which are thought to potentially influence reproductive behavior, by providing: 1) information (e.g. about contraception or reproductive health), 2) potential access to medical and contraceptive services, or 3) exposure to ideologies of lower fertility and small completed family size.

Partly because access to education in Brazil has varied both over time and between communities and regions, and partly because of high levels of grade repetition among many Brazilian students, educational attainment at age 15 on average was low among the women in the sample, but varied widely even within cohorts (see Table 1). In the analyses of reproductive behavior the highest grade completed by age 15 is included in the models.
Similarly, women's experience in urban centers varied between research communities, across cohorts, and between individual women within each community and cohort (see Table 1). Several older women (as well as some younger women who grew up in poor households) had spent several years of their childhoods and adolescence working as live-in maids in the households of urban residents. Others, however, had experienced urban living through their own family's residence in a large city. Most of those who resided in large urban centers had lived in a state capital. These state capitals are not only large urban centers, but are also the largest city in the state as well as the commercial and political nucleus of each state. Because urban dwellers generally have lower fertility than rural inhabitants, and because the experience of living in urban settings at young ages could impart a low-fertility ideology on urban residents, the number of years each woman resided in a state capital prior to age 15 is included in the analyses that follow.

Finally, media exposure prior to age 15 is believed to influence later reproductive behavior through its ability to provide information and illustrations of various lifestyles, and through its potential ability to alter values and long-held ideologies. Among the women interviewed, exposure to electronic media varied widely, with some younger women (especially those who had grown up in large cities or electrified small towns) having spent their entire lives surrounded by electronic media, and with many older women having had some exposure to radio during their childhood but only having watched television in adulthood or even middle age. Even within cohorts, however, there was a great deal of variability not only in the extent of media exposure early in the life course, but also the interest in electronic media both in the past and at the time of the research. For these reasons, the measures of exposure to electronic media were combined into a single dichotomous variable where those who watched television and listened to the radio before age 15 were coded as "1," and those who were exposed to only one or neither media were coded as "0." This variable not only captures the combined effect of exposure to both types of media, but also reflects some of the variability in the intensity of exposure to electronic media that women in the study had at young ages, as well as their differential attentiveness to these media. The percentage of ever-married women who were exposed to radio, television, or both media prior to age 15 are shown in Table 2; these results are shown for all ever-married women (who were Catholic before age 15 and had no missing values), as well as by location and by cohort.

## Reproductive History

Table 3 shows the mean values (and ranges) for some of the reproductive events of interest. As shown in this table, Coqueiros women on average have earlier ages at marriage, earlier ages at first births, later first contraceptive use, and more live births by age 35 than Arembepe women, probably in part because of their relative isolation compared to Arembepe, but probably also because of differences in their educational attainment and their historical access to electronic media. Similarly, older women (in the combined Arembepe/Coqueiros sample) experienced more births in adulthood, and first used contraception at later ages than their younger counterparts[7]. Although from Table 3 it appears that younger women have married and given birth to their first children at earlier ages than their older counterparts, it should be

recalled that the exclusion of never-married women (most of whom are young and will probably marry at later ages) from the results in this table creates "truncation bias" (Thornton and Lin 1994) as illustrated in the shortened age ranges for these events among younger women, and as described elsewhere (Dunn 2000).

## First Marital Contraceptive Use

Beyond examining the central tendencies of each of the reproductive events of interest, the data from this study permit the effects of particular life history events to be scrutinized. Table 4 presents the results of the proportional hazard analysis of the time from marriage to first contraceptive use for the 72 ever-married women with no premarital contraceptive use (and who were Catholic before age 15 and had no missing data). Of these 72 women, 50 had used some form of contraception by the time of the research. In these analyses the antilogged coefficient ($e^{Coef}$) represents the change in the rate of proceeding from marriage to first contraception (or censoring) associated with each one-unit increase in the independent variable. Antilogged coefficients greater than 1.0 correspond to increases in the rate of contraception, and those less than 1.0 correspond to decreases in the rate (see Note 6)

The "zero-order" column of Table 4 shows the effect of individual variables alone on the rate of adopting contraception after marriage. As expected, at the zero-order level cohort is a powerful predictor of the rate of first marital contraception, with the younger cohort adopting contraception 6.5 times more rapidly than women in the oldest cohort, and women in the birth cohort 1953-1962 first using contraception at a rate 3.6 times that of women in the oldest cohort. Educational attainment at age 15 also increases the rate of first contraceptive use. At the zero-order level, every additional year of education by age 15 increases the rate at which women adopt contraception by 25%. Equally dramatic is the higher rate associated with exposure to radio and television prior to age 15. Without controlling for other variables, women who both watched TV and listened to the radio prior to age 15 first use contraceptives at a rate 2.5 times that of women who were not exposed to both these media early in the life course. By contrast, neither the community of residence at the time of the research nor the years of urban residence prior to age 15 had any impact on the rate of contraception adoption at the zero-order level.

In the multivariate models, the addition of residence variables has virtually no impact on the other variables in the models, and these variables themselves have no significant effect on the timing of first contraceptive use. In Model 3, when both cohort and educational attainment are included in the model (along with the residence variables), the magnitude of the effect of cohort is diminished, indicating that differences in education account for some of the cohort effect seen in the earlier model (Model 2). In Model 3, however, education is not statistically significant and has little effect on the rate of contraception adoption.

In the final multivariate model (Model 4) shown in Table 4, media exposure prior to age 15 also accounts for some of the effect of cohort on the hazard rate of contraceptive use. Thus including the media exposure variable in the model slightly reduces the effect of belonging to one of the two younger cohorts (relative to the effect of cohort when media is not included in the multivariate model). However, even with the inclusion of education, media, and the residence variables in the model, cohort is still a powerful (and statistically significant) predictor of faster rates of contraceptive use. Thus in the full model (Model 4) the youngest cohort (those born in 1963 or later) adopt contraception after marriage at a rate 5.3 times that of the oldest cohort, while women born between 1953 and 1962 adopt contraception at a rate 3 times that of the oldest cohort.

Although much of the effect of media exposure seen in the "zero order" level is lost in the multivariate model, the other variables in the model do not account for all of the effect of media exposure. Thus, although the p-value for media exposure in Model 4 is only significant at the 16% level, in this model, even after controlling for cohort, education, and residence, women who both watched television and listened to the radio prior to age 15 adopt contraception at a rate 1.6 times faster than women who were exposed to only one or neither media. These results suggest that media exposure in general is linked to faster rates of contraception adoption, although birth cohort remains an important variable in explaining rates of contraceptive use in this region of Brazil.

## Total Births by Age 35

In Arembepe and Coqueiros all of the 86 ever-married women described above had married by age 35, and most had experienced their first births by that same age. In fact, all but

two of the 54 women who were 35 and above at the time of the research (and who were Catholic in their youth and had no missing data) had experienced at least one birth by age 35. Most of the older women had given birth many times by this age, while those under age 45 tended to have limited their childbearing to some extent. Although cohort explains some of the variability in childbearing across women of various ages, other life history variables—including exposure to electronic media in childhood—are also important factors.

Using the same explanatory variables included in the hazard analyses, the regression models in Table 5 show that along with cohort, education and urban residence, media exposure at early ages influences the total number of live births experienced by women. In these regression models the coefficients indicate the magnitude and direction of the change in the dependent variable (number of births) for each incremental change in the independent variables (the life history variables).

At the zero-order level, women born between 1953 and 1962 have on average 1.2 fewer births by age 35 as women born before 1953[8]. Similarly, women who were exposed to radio and television before age 15 had 2.4 fewer births compared to women without this media exposure. Education at the zero-order level is also a statistically significant variable in explaining the number of births women in these communities had by age 35, with each additional grade of school completed by age 15 decreasing the number of births at age 35 by 0.4. Urban residence prior to age 15 also appears to be related to lower births, but even at the zero-order level the p-values for this variable exceed 0.1, making conclusions about the effect of urban residence on later births merely suggestive. Finally, although most Coqueiros women generally had begun childbearing earlier at younger ages than their Arembepe counterparts, residence in Coqueiros does not have a statistically significant impact on the total number of live births experienced by women by age 35.

In the multivariate models cohort loses much of its explanatory power (and statistical significance) when educational attainment is included in the model (Model 3), indicating that differences in educational attainment account for much of the differences in childbearing patterns between women born before 1953 and those born from 1953 to 1962. In this model each additional year of education completed by age 15 is still significantly associated with nearly 0.4 fewer births by age 35.

In the final multivariate model, in which media exposure is included along with the other life history variables (Model 4 of Table 5), educational attainment still appears to be associated with fewer births, although in this model the education variable has lost its statistical significance. Media exposure, however, remains statistically significant in the multivariate model. Thus even after controlling for cohort, current and prior residence, and education, women who listened to the radio and watched television prior to age 15 had 1.8 fewer births by age 35 as women who were not exposed to both these media. This media exposure not only is correlated with nearly two fewer births per woman, its inclusion in the final model also accounts for most of the explanatory power of cohort and education, two variables that at the zero-order level were strongly associated with fewer births.

As in the hazard analysis of the timing of first contraceptive use, the regression analyses of total births by age 35 indicate that media exposure at young ages not only affects later reproductive behavior, but also explains some of the effect that otherwise could be attributed to educational attainment and birth cohort. In the following section some of the possible mechanisms for this impact will be explored.

## DISCUSSION

The results of the quantitative analysis reveals that media exposure at young ages is linked to faster rates of contraception adoption and fewer births by age 35, even when controlling for year of birth, education at age 15, and residence in urban centers. Since in Brazil the electronic media have not been used to overtly promote family planning programs, contraceptive use, or the ideology of small completed family size, the underlying mechanism whereby media exposure at young ages influences later reproductive behavior is difficult to know with certainty. One factor making the exact mechanism difficult to discern is that the media exposure for the women in this study took place several years to several decades in the past. Without contemporaneous observations of the role of media in forming attitudes and modifying behaviors, teasing out the precise way in which the Brazilian electronic media influenced reproductive behavior (and may be continuing to influence such behavior) is difficult. Furthermore, the present-day media and its

role in individual and community life may not reflect the historical role that these media had in the past.

But while the present electronic media may not fully represent the past situation, observations of contemporary media may shed some light on the question of how media exposure—in the absence of overt fertility-limiting messages—affects individual reproductive behavior. In addition, the observations of other investigators regarding the impact of the media on the community in past decades, and the reflections of informants themselves on the importance of media in the past and the present each inform our understanding of the role of media in mediating individual reproductive behavior.

## Electronic Media in the Past

One way that the contemporary field sites differ from these communities in the past is that today television and radio are ubiquitous (or nearly so) in both field sites, although residents in Coqueiros, being less accustomed to television viewing as part of their daily lives, tend to be less heavy viewers of television (relying more on the radio for entertainment and information) than their counterparts in Arembepe. Electronic media in general, and television in particular, are no longer the novelties they once were in these communities. Residents no longer congregate in front of open doors and windows of the few houses with television sets the way Kottak (1992) and several community members described in the early years of television reception in Arembepe. Children and adults no longer need to jockey for viewing positions around the rare television sets in the community, and no one would think to place a television in a public setting—such as in the public square—for the pleasure and admiration of fellow community members.

Given the present ubiquity of radio and television in the communities of study—as well as in other communities in Brazil and elsewhere—it is easy to forget the huge impact that the introduction of electronic media undoubtedly had on otherwise isolated communities throughout the region. Because of the portability, lower purchase price, and lower energy consumption of radios relative to television, and because radio signals have historically been more available than television signals in the region, radios, according to Arembepe and Coqueiros residents, often were present in these and other communities long before the arrival of television. Before the

establishment of permanent roads and motorized transportation systems that allowed easy travel to other communities and to nearby towns, and before electrification changed the rhythm of community life, the presence of one or more radios in the community could profoundly impact the news and information available to residents of these otherwise isolated communities.

Radios (and later television) often brought the "outside world" into the lives of community members. At a time when journeys outside the community took place on foot, by mule, by boat, or occasionally by jeep, and in a region with historically low literacy rates and without a strong popular tradition of reading (Kottak 1992), this oral (and later visual) information could transform residents of relatively isolated communities into informed and engaged individuals. For example, Kottak (1992: 275) points out that when transistor radios first appeared in Arembepe they were cherished and sought after as "information boxes" that raised the social status of the owners.

A few of the older women in Arembepe also described to me how in earlier decades, prior to the widespread availability of television in the region, they would listen to radio *novelas* in the evening hours, much as residents today watch long-running television *novelas* in the evening. Another middle-aged woman, who grew up in an area where electricity was not present and where batteries were costly, related how she was not allowed to listen to the radio on her own (in order to conserve batteries) but nonetheless occasionally turned on the radio (and tuned in the world) while her father was away and her defiant behavior would be unnoticed. These recollections reflect the draw that electronic media, particularly when they are new to the region, can have on individuals who reside in relatively isolated communities, especially when those individuals rely on oral rather than written communication for their information about the outside world.

Likewise, soon after televisions sets became common in Arembepe, residents gravitated toward them for the information they provided and for the link to the larger world they represented. Kottak (1992: 272-3) describes the situation he encountered in Arembepe:

> Villagers of the 1980s repeatedly told me that TV brings in knowledge. As one young man put it, "you sit here in this little place and you learn about the whole world because you have television."

Women in contemporary Arembepe also recalled the early days of TV in the community, and recounted flocking to the places where television programs were being shown. One native Arembepeira recalled that the first television she watched belonged to a prominent fisherman, who propped the TV up in the central square for all to watch, and ran the set off of a car battery. Another local woman, who in her adolescence lived for several months in the outskirts of the local district seat, said she first watched TV in the home of her grandmother, and that at the time she "walked one kilometer to watch battery operated television" (*andava um kilometro pra assistir* [*TV*] *de bateria*), so strong was her desire to engage in the new medium. Other residents said that they first watched TV in the homes of other local residents (neighbors or relatives), before they acquired television sets for use in their own homes. One middle-aged woman, who lived her entire life in Arembepe and who watched TV for the first time in her late thirties, recalled that "as soon as television and 'lights' [electricity ] arrived [in the community] we bought a television set" (*assim que apareceu a TV e a luz que a gente comprou a televisão*), reflecting the sentiment of many residents her age who welcomed the new medium as a source of information, entertainment, and distraction from the toils of everyday life.

As a rule, the women who had grown up in communities without television and had witnessed the introduction of this technology into their communities in their youth or adulthood remembered their first experience of television with clarity, recalling the periods in their lives when this first exposure had taken place. Several even commented that they remembered the first tele*novela* they had ever watched, and proceeded to cite the title of the decades-old series, while some others recalled watching particular events—such as the 1970 World Cup soccer match, in which Brazil won the cup for an unprecedented third time—early in their viewing lives. The recollections of the first exposure to television by women who had experienced a "pre-television" environment were in sharp contrast to the less vivid and often vague accounts of first television exposure by those who had grown up surrounded by the medium, whether in the field sites in recent decades, or in large urban centers in the recent or more distant past.

## Contemporary Media Consumption

While the novelty of radio and television may have dissipated as households in the communities of study acquired these devices, the attraction to these media as sources of

entertainment and information remains. With only rare exceptions, all of the women interviewed in Arembepe and Coqueiros had watched some television on a daily basis in the previous 12 months, and nearly all also listened to the radio on a daily basis. In Arembepe, women tended to be more attuned to television than to radio, often taking the time to sit down in the afternoon and evening to watch *novelas* or the news. However, it was not uncommon for these same women to report listening to the radio at home during the morning hours as they went about their daily chores of cleaning the house and preparing the midday meal[9].

Most of the women interviewed not only tuned in to the electronic media, but also consumed substantial amounts of electronic media at the time of the research. In Arembepe nearly 40% of the randomly selected women watched between 1 and 3 hours of television per day, while another 24 % watched between 3 and 5 hours, and 21% watched 5 to 10 hours on a daily basis[10]. Among this same group of women 34% listened 1 to 3 hours of radio per day, 22% listened to between 3 and 5 hours per day, and 20% listened to between 5 and 10 hours per day. The figures for television viewing in Coqueiros are similar, with 41% of women interviewed watching between 1 and 3 hours, 33 % watching between 3 and 5 hours, and 19% watching 5 to 10 hours on a daily basis. The women in Coqueiros tended to listen to slightly more hours of radio than Arembepe women, with 25% listening for 1 to 3 hours per day, 39% listening to between 3 and 5 hours per day, and 25% listening to between 5 and 10 hours per day[11]. Hence in both Arembepe and Coqueiros nearly all women were attuned to the electronic media on a daily basis, and most were engaged with media for considerable portions of their days.

Residents of these communities not only tuned in to electronic media, but were also actively engaged with it. Of the 170 women interviewed, 85% watched one or more *novelas* per day, and 65% watched two or more *novelas* daily[12]. Most of these women also said that *novelas* were their favorite programs to watch, and throughout the communities women (as well as men and children) could be heard referring to, commenting upon, and discussing the characters and story lines of the evening *novelas*. Likewise, many also watched the news on a regular basis, with 82% of Coqueiros women and 64% of Arembepe women watching one or more television news broadcasts per day. Fully 36% of the women in Coqueiros (compared to only 15% of the women interviewed in Arembepe) said that the daily news was their favorite television program. The higher interest in television news among Coqueiros women is consistent with their higher levels of attention to radio news broadcasts. Compared to Arembepe women (only 44% of

whom reported listening to radio news one or more times per day in the preceding 12 months), 75% of Coqueiros women reported listening to news broadcasts on the radio at least once per day in the preceding 12 months. Thus Coqueiros women make more use of the news aspect of electronic media than do Arembepe women, although both groups of women consistently tune in to the radio or television news on a regular basis, and both groups also watch evening *telenovelas* in large proportions.

## Contemporary Media Programs

The contemporary media—and probably the Brazilian media in the past as well—not only expose the viewers to life outside the immediate community, they also transmit information and values about the larger world. Contemporary television viewers and radio listeners are presented with information about city life—including life in Brazil's major urban centers (São Paulo and Rio de Janeiro), where the national news programs and *novelas* are produced—and information about events occurring in nearby city centers, from where local news programs are broadcast. Through news programs, documentaries, radio call-in programs, and some of the *novela* story lines, viewers and listeners are exposed to information about local, regional, and national events, about the national and regional economy, and about politics at the national, regional, and local levels.

On the most-watched television network (Globo) the national evening news focuses on: 1) the national economy (including, in the late 1990s, stories about the foreign debt, inflation rates, unemployment, and industrial slowdowns), 2) national and international tragedies (such as recurrent droughts and the human misery they generate, major floods and other "natural" disasters, highway accidents, and plane crashes), 3) state and national political news (including news from the legislative and executive branches as well as political scandals), 4) urban crime, and often 5) some human interest story (frequently about individuals overcoming major obstacles or engaging in great acts of human kindness). The local television news, broadcast from Salvador, focuses on local and state politics, economic developments, and crises. Except in response to human interest stories, and occasional positive comments about favorite political characters, recording artists, or television actors, no one iin the field sites was ever heard to

speak positively about events heard on the news. To the contrary, residents often expressed shock or dismay at the events and stories that unfolded before them on the television news.

Because of the emphasis on the then-worsening Brazilian economy and other "bad" news, the national and local television news often projected negative messages about the world, including the potential dangers present in modern life, the uncertainty of the national and regional economies, the precariousness of the lives of manual and low-skilled laborers, the high cost of living and the scarcity of well-paying jobs. Although some of these messages (such as the paucity of well-paying jobs, especially for low-skilled workers) were evident in the everyday lives of residents who did not have steady employment, other messages about the region or the nation may not have penetrated the lives of residents on a daily basis (and with the voice of authority that can often be diluted with word-of-mouth re-tellings of the same news) were it not for the presence of the electronic media in the homes of nearly all residents. Through television news, then, residents were given a daily dose of economic, political, and social information about the world around them.

Except for the federally produced "Voz do Brasil," featuring primarily news of governmental activity, in the late 1990s there was no national radio news program available at the field sites. And although many residents and shopkeepers had their radios turned on in the late afternoon—in fact some older women specifically made a point each day of listening to the 6:00 PM playing of the "Ave Maria" that could be heard on at least one radio station—most Arembepe residents turned off their radios as soon as "Voz do Brasil" aired in the early evening. Hence most of the news obtained from the radio was local and state news. Most of these local broadcasts emanated from Salvador, and focused primarily on the issues and problems of that city, with some attention also being paid on these broadcasts to the governance of the state of Bahia (whose seat of power is located in Salvador), and with occasional reference to national and international events.

Most of the news available on the radio—often in the form of short morning segments squeezed in between music programs or interview and call-in programs—often focused on local politics, on the infrastructural and other problems of the city and its environs, and on crime and accidents (with at least one reporter regularly reporting from the city's main emergency hospital). Job listings in the city (along with statements of the necessary educational qualifications for each position) also were a regular feature of at least one radio station, as was a call-in program that

attempted to resolve problems that residents were having with local bureaucracies such as utility companies and the city government. Unlike the television news broadcasts, the news programming on the radio were interspersed with commentaries from radio personalities, commentaries that often emphasized the horrific nature of certain events or the callous behavior of some bureaucrats and politicians, drawing additional attention to these stories, events, and issues. Given the focus on crime, accidents, and other urban problems, as well as the frequent references to jobs and education, the news broadcast on the local radio stations projected the notion that the world is a dangerous and uncertain place, and that a strong educational background (preferably the completion of secondary school) is needed in order to secure good employment, at least in major metropolitan areas.

That these news broadcasts were in fact internalized by many women in Arembepe and Coqueiros is evidenced by the fact that segments from the previous day's or week's news often formed the basis of discussion during visits and other encounters among residents. This was especially true if the news contained shocking or dramatic information (such as news of tragic highway accidents, airline crashes, droughts, or other calamities in the region or in other parts of the country and the world), or political news of a local nature (such as the indictment of the former mayor of the local municipality). In addition to reporting to their friends and neighbors what they had seen or heard on the news, residents often added their own commentaries about the stories in question (especially if others in the discussion were already familiar with the factual details), and, in the case of local news, sometimes provided additional details reportedly told to them by friends or acquaintances with "insider" knowledge.

Besides transmitting national and local news, electronic media also project attitudes and ideologies in more subtle ways. One such example of cultural values that are transmitted on the media is the aforementioned playing of the "Ave Maria" on the radio each evening. This tradition not only marks the 6:00 hour with a haunting melody, but also recognizes the Catholic tradition shared by most Brazilians, and honors a religious figure adored by many women. The nightly *telenovelas*, which utilize the serial format and familiar Brazilian themes to capture and retain audience interest, similarly project cultural values, particularly the values and lifestyles of middle-class (and upper-middle-class) educated urban residents.

Although television and radio news broadcasts tend to project images of large cities as being difficult and problematic places in which to reside, the *telenovelas* and many television

advertisements project middle-class urban life as comfortable and stylish. Particularly on the "8:00" *novela*, viewers are shown fashionable characters who reside in large, comfortable homes and enjoy all of the amenities, conveniences, and thrills of city living. Although jobs and workplaces are seldom the focus of *novela* story lines (Kottak 1990a), the main characters in the late evening *novelas* often have high-status jobs that provide them with the income and leisure to enjoy their urban lifestyles. The few children and adolescents who are shown on *novelas* are usually portrayed as being in school and focusing on their educations.

Residents in the field sites noticed and commented on the images projected on the evening *novelas*. Many remarked that one of the reasons they enjoyed the *novela* "O Rei do Gado" so much (in spite of it becoming "boring" in the middle sections of its 8-month run), was that the scenery on the program—spanning the Amazon watershed to the southern agricultural states—was so beautiful. Many women also commented on the appearances of the characters—such as whether protagonists or antagonists were "beautiful," and particularly whether certain couples "looked" like they belonged together—and many commented about the fine clothing worn by the well-to-do characters in the *novela* "O Rei do Gado." Since the home is often the site of *novela* story lines, many of the scenes in the evening *novelas* take place around the dinner table. This was particularly true in "O Rei do Gado," a fact that prompted one middle-aged woman with whom I often watched the evening *novelas* to comment that there was such an abundance of good food shown on the *novelas* that it often made her hungry to watch it[13].

Local residents also referred to *novela* characters and story lines in everyday conversations, using the (often exaggerated) faults of *novela* characters to describe the misdeed or character flaws of relatives or others in the community. At other times, residents picked up on novel themes from the *novela* plot and incorporated these into their daily lives. In *A Indomada*, for example, one of the central female characters was portrayed as suffering from sexual addiction, and her insatiable desire for her husband's affections not only fueled the farcical story line, but also generated discussion on the topic of sexual addiction among Arembepe women. Likewise, since this *novela* was set in a fictitious northern town reportedly founded by English immigrants, the characters' lines were peppered with English phrases such as "my God" and "shit" which eventually were heard in the everyday conversations of Arembepeiros. Even children were not immune from the influence of *novelas*, incorporating phrases and themes from the *novela* into their playful activities. During *O Rei do Gado*, for example, a group of children in Arembepe

were heard referring to one of their playmates as *o rei do gado* (the king of cattle) when the cows that were pastured on the fields and marshes on the outskirts of town (and occasionally wandered through the streets of the community) suddenly came into view.

## Media Perceptions

Because *novelas* are the major evening entertainment on Brazilian TV, and because *novela* viewing has become part of the daily pattern of Arembepe residents, I attempted to discern the degree to which Arembepe and Coqueiros residents identified with *novela* characters and the *novela* lifestyles by asking each woman in the study if she thought *novelas* are similar to "real life" and to her own life. The results were varied, with roughly one third of the 170 randomly selected women believing that *novelas* are not realistic, and the other two-thirds feeling that they realistically portrayed real life situations at least some of the time. More than half of the women thought, however, that the *novelas* were not like their own lives, and some were emphatic in negating the difference between *novela* life and their own everyday lives. As one middle-aged fisherman's wife put it, the *novelas* have "nothing to do" (*nada a ver*) with her own life, even though she enjoys watching the evening *novelas*. Another younger woman—a sixteen-year-old girl who had spent her entire life in the community—remarked that "on the *novelas* everything [in life] is easy; for me nothing is easy" (*na novela tudo é facil; pra mim nada é facil*) revealing the dissonance between the lives of television characters and the real-life struggles of those who consume these programs. Not surprisingly, those who believed that the life presented on *novelas* was not realistic tended not to see the influence of this medium in their own lives. Nearly all of those who thought that *novelas* were not realistic also felt that television had not changed their lives at all. By contrast among those who could relate to some aspects of *novelas* and thought that they had at least some realistic aspects to them, nearly one third also believed that television in general had changed their lives. Those who perceived television (and to a lesser extent radio) as having changed their lives in some way often cited the entertainment value of television (as a medium that "distracts," "entertains," and "relaxes" the viewer) as well as the fact that television (and radio) keeps one informed. Several women alluded to the informational and educational aspects of television. For instance, one native Arembepeira (who had moved with her family to Salvador when her children were young so that they could enjoy the benefits of better schools in

the large city), in discussing her impression of the impact of television on her life said: [with television] we learn many things; [we] are more 'in the know'" ([*com TV*] *a gente aprende muita coisa; fica mais por dentro*). Still, however, only about one quarter of the 170 women interviewed thought that the presence of television in their communities, in their homes, and in their everyday lives had changed their lives in any way, with older women being more likely than younger women to believe that the medium had changed their lives in some way.

In spite of most women not believing that TV affected them, many in the communities of study thought that television (and radio to a lesser extent) had changed the community where they resided[14]. Roughly one quarter of women who responded that *novelas* were not realistic (and about one third of women who thought there were some realistic aspects to *novelas*) believed that television had changed their communities at least a little[15]. Many women readily attributed some of the changes they witnessed in their communities—in particular negative changes—as being caused by television. Some said that television "teaches bad habits" (especially to children), and others saw television as being somehow linked to increased violence in the community (particularly in Arembepe, where the local lore preserved and repeated stories of violent acts in and near the community). A few older Arembepe women also observed that before television arrived in the community residents used to visit and talk in front of their homes in the evening hours, while today residents move indoors in the evening to watch the *novelas* inside their homes. Interestingly, although about one quarter of the women interviewed believed that radio had changed their communities, few claimed that radio had negatively affected their own communities. Thus in the local perception television (and to a lesser extent radio) is seen by some as influencing community norms and behaviors, although most women (and particularly younger women) do not perceive that the electronic media have had much impact in their own lives, except perhaps to inform them about the world or to provide easy sources of entertainment and distraction from everyday life.

## Perceptions about Children

Not surprisingly, none of the women in the study suggested that television or radio had changed their own individual reproductive behaviors or their attitudes about family size and family planning. Most women involved in the study, however, seemed to believe that small

families were not only more desirable nowadays, but were the only viable family form in the current economic environment. Most women in each cohort thought that the ideal number of children to have was 2 or fewer, and many indicated that "a boy and a girl" (*um casal*) would be ideal. Since most of those holding this view were members or large families, and since many of the older women had themselves borne many children, the contemporary desire for small families represents a major shift in the ideology of family size, especially since older women frequently commented that "in their day" one didn't really think about how many children one wanted[16].

Where the desire for fewer children ultimately comes from is difficult to know with certainty, but it seems to be associated with the perception that children are "expensive" to raise, that their futures are uncertain, and that they require a good education in order to succeed. Over 90% of women in each cohort (among the sample of 170 randomly selected women), and roughly the same proportion in both Arembepe and Coqueiros, thought that "nowadays children cost a lot to raise" (*hoje em dia crianças custam muito para criar*). Several women asserted that the education of children was particularly costly. Nearly all women with school-aged children hoped and expected that at least one of their children would finish high school, and 3/4 of the women under the age or 45 expected that at least one of their children would attend college, even though in the majority of cases these women themselves had not completed high school[17].

Although this educational expectation is out of keeping with the educational backgrounds of these mothers, they are not totally unrealistic, since the placement of a high school in Arembepe in the early 1990s has increased the educational opportunities of young people in the area, and several young men and women from Arembepe were attending college in Salvador at the time of the research (or had attended college in the recent past). In many cases the parents of these college students had not attained high levels of education, and in more than one family the son or daughter of parents who had not completed primary school was enrolled in college.

Residents of Arembepe and Coqueiros were well aware of the need for education to land lucrative and stable jobs. Given the penetration of the wage-labor economy into these communities, and the repeated reminders in everyday life and on the media broadcasts of the need for education to attain good jobs, parents encourage their children (both boys and girls) to gain as much schooling as possible. Parents also facilitate this acquisition by providing school fees and uniforms, by arranging (when possible) for their children to attend "better" school in

Salvador and elsewhere, and, if their resources permit, by paying for tutors and private schools, all in the hopes that their children will finish high school with a strong enough education to pass the difficult college entrance exam.

Although other costs related to childrearing may influence the perception that children today are "expensive" to raise, many household costs related to children can be "shared" among several children, thus reducing the absolute cost of adding another child to the family. The cost of education, however, increases incrementally not only with each additional child, but also with greater expectations for high educational attainment for children. Women (and men) in the field sites seemed to want to give their children all of the necessary resources to become successful adults, and balanced the awareness of the "cost" of children with their strong desire to have a family—ideally one that consists of at least one child of each gender.

According to one anthropologist, the notion that children are "expensive" to raise was not present in Arembepe in the 1960s and early 1970s (Kottak, personal communication), suggesting that the development of this way of thinking may be linked to the social changes that Arembepe (and Coqueiros to a lesser extent) has undergone in recent decades. These changes include rapid growth and economic development, improved transportation that links the community to nearby cities, the expansion of educational opportunities, and the widespread dissemination of electronic media throughout the community. Although each of these changes can potentially alter values and attitudes, the electronic media seem to be have a powerful ability to fuel the perception that children nowadays "cost" a lot to raise.

Through a variety of programs—including news broadcasts that focus on the state of the economy and the plight of low-skilled and poorly educated workers, and *novela* images of middle-class urban families who enjoy comfortable lives and who lavish their children with consumer goods and purchased services—the electronic media project potent images of an urban lifestyle that depends on wage labor, yet is rife with uncertainty. To overcome this uncertainty and succeed in this world, a good education—which leads to better employment options—is needed, even though such education is difficult to provide for many children. Although other sources of information—such as visits to urban centers, contacts with others through friendship and family networks, and both direct and indirect exposure to education—can carry similar messages, the electronic media are unique in that they are transmitted directly into the

community and the homes of individuals, making their messages accessible to even isolated and poorly educated residents.

That residents internalize at least some of the media messages is evidenced by the fact that news items and *novela* references find their way into everyday conversations. The fact that so many current media consumers concur that children have a cost and small families are optimal—ideas that were absent in Arembepe 40 years ago but are presented in multiple ways in the contemporary electronic media—suggest that media may be influencing reproductive behavior by changing the local ideology about family and children.

## CONCLUSION

This paper examined the impact of exposure to electronic media on the timing of first contraceptive use and on the total number of births women in two communities had by age 35. The results indicate that even after controlling for cohort, residence, and education, media exposure early in the life course affects later reproductive behavior.

In the contemporary setting women in the study were heavily engaged with radio and television on a daily basis. Although many did not personally identify with the *telenovela*, most seemed to have internalized messages from news stories and *novela* images, including messages about the need for education, and the monetary cost associated with raising a large family.

Although the electronic media are thought to play an important part in shaping attitudes, none of the women in this study suggested that television or radio played any part in forming their attitudes about ideal family size or the high "cost" of raising children today. If the electronic media, in fact, influence individuals to desire fewer children and controlled fertility, the media apparently do so in a way that renders its audience unaware of the impact of its messages.

# NOTES

[1] For Brazil as a whole these percentages ranged from 63% for women with no formal schooling to 77% for those with 1-3 years of schooling, to 93% for women with 5-8 years of education, and 97% for women with 12 or more years of education (BEMFAM 1997:32).

[2] The urban/rural figures for TV viewing in Brazil as a whole are as follows: 93% or urban women and 69% of rural women of reproductive age watch television on a weekly basis (BEMFAM 1997:32).

[3] In addition to this sample of randomly selected women, I also interviewed an additional 43 women using the same pre-printed questionnaire and an abbreviated version of the household survey. These 43 women, along with 10 others who were captured in the random sampling, were women who had taken part in an earlier study by Kottak and others (Kottak 1990a) designed to investigate the effects of television on everyday life. The quantitative data from the above 43 women were not used in the numerical analyses presented here, since these cases were not part of the random sample. However, the insights and perspectives of these women inform the interpretation of these data, and appear in various comments quoted in this paper.

[4] In this region of Brazil many unions are not formal marriages, but rather are informal consensual unions, which are referred to locally as "being *amaziado(a)*." While lacking the formality of civil or religious marriages, these consensual unions tended to be long-term relationships characterized by a lifetime of commitment to the partner and to the couple's children. Furthermore, residents often used the term "married" (*casado[a]*) to refer to themselves or others who were technically *amaziado(a)*. In this paper the term "marriage" is used in the same sense as it is in Arembepe and Coqueiros, that is, to refer to both formal marriages and informal consensual unions.

[5] No attempt to control for the duration of marriage in either the analyses of timing of first contraceptive use, or in the analyses of total births, below.

[6] One of the advantages of utilizing event history analysis instead of other analytical methods is that the analyses are not confined to only those individuals who experienced the event, but rather use the information from all individuals "at risk" for the event to model the hazard rate of the event occurring. Thus individuals who do not experience an event, but who nonetheless contribute information about the "hazard" of events occurring, are retained in the risk set until the event occurs or until the observation period ends (Allison 1984, Singer and Willett 1991). For instance, in an analysis of the hazard rate associated with first contraceptive use, women who were married but who did not use contraceptives in their lifetimes (or had not yet at the time of the research) contribute valuable information about the hazard rate of contraceptive use among women in northeastern Brazil. Individuals in the risk set who have not experienced the event by the time of the completion of study (but who theoretically still could experience the event at a later date) are retained in the risk set and are identified as being "censored" in order to distinguish them from individuals who have, in fact, experienced the event. In the analyses of the timing of first contraceptive use, women who had not experienced the event (contraceptive use) by age 50 were censored at age 50, since by this age most women had entered menopause and were no longer "at risk" of using contraceptives.

The hazard analyses presented here were conducted using a Cox Proportional Hazard model. This model assumes that the hazard rates associated with different levels of the covariates in the model are proportional to each other, but unlike other hazard models, it makes no assumptions about the underlying shape of the baseline hazard function (Singer and Willett 1991). It simply assumes that the relative rate among different groups or across different levels of a variable is constant across time, varying only according to the levels of the covariates or independent variables (SAS Institute 1998). For these analyses the proportionality assumption was checked by comparing the curves of the ln(cumulative hazard), or ln[-ln(Survival Function)], versus ln(time) in the models stratified by each independent variable (covariate) of interest. Since the curves produced for each covariate were roughly parallel (or, in the case of covariates that produced no effect, nearly identical to one another), the proportionality assumption was satisfactorily met (SAS Institute 1998, Teachman 1983).

The Cox Proportional Hazard model is of the form:

$$\log h(t) = a(t) + b_i x_i$$

where h(t) is the hazard rate, a(t) is an unspecified function of time, $x_i$ are the individual covariates, and $b_i$ are the coefficients of each covariate (Allison 1984). The antilog of each coefficient, $e^{bi}$, gives the relative hazard rate associated with that particular covariate in the multivariate model (Singer and Willett 1991). For continuous-level variables the antilogged coefficient ($e^{bi}$) represents the increase in the hazard rate associated with a one-unit increase of the continuous variable, controlling for all of other variables included in the model. For categorical variables, such as membership in particular cohorts or other subgroups of the sample, the antilogged coefficient represents the increase in the hazard rate associated with the corresponding level of the categorical variable, also controlling for all other variables in the model (Allison 1984, Collett 1994, Singer and Willett 1991). Values of $e^{bi}$, or $e^{Coef}$, greater than one represent increases in the hazard rate associated with that covariate, while values of $e^{Coef}$ less than one represent decreases in the hazard. Values of $e^{Coef}$ equal to 1.00 have no effect on the hazard rate.

[7] The pattern of contraceptive use varied widely in the communities of study. Few women over the age of 50 had ever used contraception. Many of the women in their 40s had undergone tubal ligations, often after numerous pregnancies; many of these women did not have experience with any other form of contraception, although some had used reversible forms (usually the pill) to limit and space their children earlier in their marriages, turning to tubal ligation as a permanent and final method of birth control. Women between the ages of 25 and 45 were most varied in their contraceptive use, with some having tried several reversible methods, some already having had tubal ligations, and a few never having used contraception. Although some of the women had used contraception premaritally, the use of contraception before marriage was most common among women born after 1962. Finally, prior or current contraceptive use in the teen years was most common among the youngest women in the sample, those who were between the ages of 15 and 24 at the time of the study.

[8] Note that the younger cohort, i.e. women born in 1962 or later, are not included in this analysis, since they had not reached age 35 at the time of the research.

[9] Some women also reported having the television set on during the daytime, listening to it and catching occasional glimpses of it while working in the home. In fact, many Arembepe women said that they kept the TV set on throughout the day in order to keep it "warm," since, as they put it, the salt-laden sea air corroded the electrical components of the television sets, and keeping the sets turned on was believed to minimize the corrosive effects of the seaside air. In Coqueiros, which is several kilometers inland from the ocean, residents were not only less concerned with the corrosive effect of the air, but were also more attuned to the cost of electricity, frequently conserving energy by keeping lights and electrical appliances turned off when not in use.

[10] The actual ranges used in the study were: 1) none, 2) less than one hour per day, 3) one or more hours but less than three hours per day, 4) three or more hours but less than 5 hours per day, 5) five or more hours but less than 10 hours per day, and 5) more than 10 hours per day. These ranges were selected to correspond to observed television

[11] In each location the figures for television viewing and radio listening vary somewhat by cohort, with the youngest women in general being the heaviest consumers of media, followed by the oldest set of women, reflecting, in part, differences in leisure time available to women throughout the life course.

[12] In Arembepe 86% of women watched at least one novela per day, while 66% watched two or more novelas per day. In Coqueiros the figures are 75% and 61%, respectively.

[13] This same woman also observed one of the striking difference between life in Arembepe and that portrayed on the American serial *E.R.* During one episode of this program (which is dubbed into Portuguese for Brazilian audiences) she remarked "there are so many doctors [there] and Arembepe doesn't have one ("tanto médico, e Arembepe não tem nenhum"), illustrating not only her astute comparison of her community with her perception of life in a large city in the U.S., but also reflecting the community's negative sentiment toward the then-current municipal "mayor" (who in effect runs the county-sized municipality) for not funding the community health center, and for neglecting to staff it with permanent physicians.

[14] As with views about the effect of electronic media on their own lives, older women were more likely than younger women to regard these media as having influenced their communities.

[15] Unlike opinion questions about the impact of media on their own lives, about one quarter responded that they "didn't know" or "couldn't say" whether television (or radio) had changed their communities.

[16] Among the women interviewed, many reported that they were aware of the availability of herbal abortifacient "teas" that could be used to limit fertility, both in the past and at the time of the research. A few reported having tried these remedies, while others disparaged women whom they said had used these concoctions at one time or another. Although the efficacy of these "teas" is not know, the reports of women having used these preparations repeatedly suggests that they did not always achieve their intended effect. On the other hand, the fact that women in the past knowingly used abortifacient teas—albeit possibly without full knowledge of being pregnant, since some women distinguished between the morality of having a surgical abortion and "bringing on menstruation" with herbal teas—suggests that at least some women wanted to control their childbearing prior to the ready availability of modern contraception. Most middle-aged and older women, however, in discussing their own reproductive histories, did not express regret at their many pregnancies and births; generally the only sadness or regret detected was in their descriptions of the fetal losses or child deaths they had experienced. Most of these same women, however, recognizing how the world around them had changed in recent decades, said that if they were to start their lives over again (and live it in the present reality) they would have no more than two children.

[1717] In Coqueiros half of the women (of all ages) responded either that they "didn't know" whether their children would attend college, or that it would "depend" on other factors. Another 35% thought one of their children would attend college, and 14% believed they would not. In Arembepe only 12% were uncertain whether their children would attend college, while 74% thought they would, 4% had children who had attended (or were attending) college, and 10% thought their children would not attend college. The uncertainty among Coqueiros residents in whether their children will attend college probably reflects, in part, the dearth of college-educated individuals in their community, and the lack of role models—among their neighbors—for achieving a college education. It probably also reflects the more meager monetary resources of most Coqueiros residents compared to the average

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# Tables

## Table 1 - Educational Attainment and Urban Residence for Ever-Married Women, by Location and Cohort

| | n | Mean | Range |
|---|---|---|---|
| **Highest School Grade Completed by Age 15** | | | |
| All ever-married women | 86 | 3,8 | 0 - 9 |
| Arembepe women | 71 | 3,9 | 0 - 9 |
| Coqueiros women | 15 | 3,1 | 0 - 7 |
| Women born after 1962 | 31 | 4,9 | 1 - 9 |
| Women born 1953-1962 | 27 | 3,9 | 0 - 8 |
| Women born before 1953 | 28 | 2,4 | 0 - 5 |
| **Number of Years Resided in State Capital by Age 15** | | | |
| | | | 14 - 38 |
| All ever-married women | 86 | 3,5 | 0 - 15 |
| | | | 15 - 38 |
| Arembepe women | 71 | 3,6 | 0 - 15 |
| Coqueiros women | 15 | 3,3 | 0 - 15 |
| | | | 15 - 24 |
| Women born after 1962 | 31 | 4,0 | 0 - 15 |
| Women born 1953-1962 | 27 | 3,3 | 0 - 15 |

| | | | | | |
|---|---|---|---|---|---|
| Women born before 1953 | 28 | 3,2 | 0 | - | 15 |

* Only ever-married women with no missing data & who were Catholic before age 15 are included in the analysis.

## for Ever-Married Women, by Location and Cohort

| | n | % of n |
|---|---|---|
| **% Watched TV before age 15** | | |
| All ever-married women | 86 | 58,1 |
| Arembepe women | 71 | 60,6 |
| Coqueiros women | 15 | 46,7 |
| Women born after 1962 | 31 | 83,9 |
| Women born 1953-1962 | 27 | 70,4 |
| Women born before 1953 | 28 | 17,9 |
| **% Listened to Radio before age 15** | | |
| All ever-married women | 86 | 75,6 |
| Arembepe women | 71 | 73,2 |
| Coqueiros women | 15 | 86,7 |
| Women born after 1962 | 31 | 80,7 |
| Women born 1953-1962 | 27 | 81,5 |
| Women born before 1953 | 28 | 64,3 |
| **% Watched TV and Listened to Radio before age 15** | | |

| | | |
|---|---|---|
| All ever-married women | 86 | 48,8 |
| Arembepe women | 71 | 50,7 |
| Coqueiros women | 15 | 40,0 |
| Women born after 1962 | 31 | 71,0 |
| Women born 1953-1962 | 27 | 55,6 |
| Women born before 1953 | 28 | 17,9 |

* Only ever-married women with no missing data & who were Catholic before age 15 are included in the analysis.

## Table 3 - Reproductive Events for Ever-Married Women, by Location and Cohort

| | n | Mean | Range |
|---|---|---|---|
| **Age at first marriage** | | | |
| All ever-married women | 86 | 20,4 | 13 - 35 |
| Arembepe women | 71 | 20,7 | 13 - 35 |
| Coqueiros women | 15 | 19,1 | 14 - 34 |
| Women born after 1962 | 31 | 18,8 | 14 - 26 |
| Women born 1953-1962 | 27 | 21,4 | 13 - 34 |
| Women born before 1953 | 28 | 21,4 | 14 - 35 |
| **Age at first live birth** | | | |

| | | | | | |
|---|---|---|---|---|---|
| All ever-married women with ≥1 live birth | 83 | 21,3 | 14 | - | 38 |
| Arembepe women | 68 | 21,7 | 15 | - | 38 |
| Coqueiros women | 15 | 19,2 | 14 | - | 25 |
| Women born after 1962 | 29 | 19,9 | 15 | - | 24 |
| Women born 1953-1962 | 26 | 22,0 | 16 | - | 30 |
| Women born before 1953 | 28 | 22,0 | 14 | - | 38 |
| **Age at first contraceptive use** | | | | | |
| All ever-married & ever-contracepting women | 63 | 23,1 | 15 | - | 40 |
| Arembepe women | 52 | 22,9 | 15 | - | 40 |
| Coqueiros women | 11 | 23,9 | 17 | - | 39 |
| Women born after 1962 | 28 | 20,6 | 15 | - | 30 |
| Women born 1953-1962 | 23 | 22,7 | 15 | - | 30 |
| Women born before 1953 | 12 | 29,4 | 22 | - | 40 |
| **Number of live births by age 35** | | | | | |
| All ever-married women ≥35 years old | 54 | 4,3 | 1 | - | 11 |
| Arembepe women | 46 | 4,3 | 0 | - | 11 |
| Coqueiros women | 8 | 4,8 | 1 | - | 8 |
| Women born 1953-1962 | 26 | 3,7 | 0 | - | 9 |
| Women born before 1953 | 26 | 4,9 | 0 | - | 11 |

* Only ever-married women with no missing data & who were Catholic before age 15 are included in the analysis.

## Table 4 - Proportional Hazard Analysis of Time from Marriage to First Contraception For Ever-Married Women* with No Premarital Contraception

| | Zero-Order Coefficients | | MODEL 1 | | MODEL 2 | | MODEL 3 |
|---|---|---|---|---|---|---|---|
| | P-Value | Coef e | P-Value | Coef e | P-Value | Coef e | P-Value |
| **Birth Cohort** | | | | | | | |
| Born in 1963 or later (n=26) | <0.001 | **6,53** | <0.001 | **6,54** | <0.001 | **6,48** | <0.001 |
| Born 1953-1962 (n=18) | <0.001 | **3,62** | <0.005 | **3,60** | <0.005 | **3,62** | <0.005 |
| (Omitted: born before 1953; n=28) | | | | | | | |
| **Community** | | | | | | | |
| Resides in Coqueiros | 0,92 | **1,03** | 0,93 | **0,97** | 0,92 | **0,96** | 0,94 |
| **Urban Residence** | | | | | | | |
| # Years resided in State Capital before age 15 | 0,52 | **1,02** | | | 0,84 | **1,01** | 0,87 |
| **Education** | | | | | | | |
| Highest school grade completed by age 15 | <0.005 | **1,25** | | | | | 0,47 |
| **Media Exposure** | | | | | | | |
| Listened to Radio AND Watched TV before age 15 | <0.005 | **2,51** | | | | | |
| (Omitted: exposed to one or neither medium) | | | | | | | |
| **Model Likelihood Ratio (df)** | | | 25.86 (df=3) | | 25.90 (df=4) | | 26.42 (df=5) |
| **number of cases: 72; number of events: 50** | | | | | | | |

* Only ever-married women with no missing data & who were Catholic before age 15 are included in the analysis.

## Table 5 - Regression Analysis of Number of Live Births by Age 35 For Ever-Married Women* aged 35 and above

| | **Zero-Order Coefficients** | | **MODEL 1** | | **MODEL 2** | | **MODEL 3** | | **MODEL 4** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | P-Value | Coef | P-Value | Coef | P-Value | Coef | P-Value | Coef | P-Value | Coef |
| **Birth Cohort** Born 1953-1962 (n=26) (Omitted: born before 1953; n=28) | 0,07 | **-1,24** | 0,08 | **-1,22** | 0,08 | **-1,19** | 0,38 | **-0,61** | 0,81 | **-0,16** |
| **Community** Resides in Coqueiros | 0,62 | **0,49** | 0,73 | **0,34** | 0,66 | **0,41** | 0,98 | **-0,03** | 0,98 | **-0,02** |
| **Urban Residence** # Years resided in State Capital before age 15 | 0,13 | **-0,11** | | | 0,13 | **-0,10** | 0,10 | **-0,11** | 0,19 | **-0,09** |
| **Education** Highest school grade completed by age 15 | <0.01 | **-0,42** | | | | | <0.05 | **-0,38** | 0,22 | **-0,21** |
| **Media Exposure** Listened to Radio AND Watched TV before age 15 (Omitted: exposed to one or neither medium) | <0.001 | **-2,43** | | | | | | | <0.05 | **-1,80** |
| **Model P-Value (df)** | | | 0.18 (df=2) | | 0.13 (df=3) | | <0.05 (df=4) | | <0.01 (df=5) | |
| **number of cases: 54** | | | | | | | | | | |

* Only ever-married women with no missing data & who were Catholic before age 15 are included in the analysis.