

Between Tradition and Modernity: The Transition of Contraception Use in Colombia

Entre lo tradicional y lo moderno: transiciones en el uso de anticonceptivos en Colombia

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Abstract

The transition of contraception use in Colombia was an important moment when health and fertility were tightly associated with social behavior. Multi-level multi-process (duration and method choice) life history analysis of contraceptive use allows the identification of determinants. Individual trajectories show many successive spells of adopting or ceasing contraception. Younger women displayed discontinuous behavior with a large proportion of total fertility (which itself has been decreasing since the mid-1960's) concentrated in the earliest ages. After the pioneer generation of 1935-40, the generations of 1955-59 and 1960-69 mastered contraception, the generation 1970-79 used contraception for spacing. Contraception was strongly associated with material life condition, with education taking a secondary role. Son (or

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girl) preference appeared to be absent. Contraceptive methods were examined for their influence on intermittent behavior as a particular method might be used for only a short period. The pill and male condoms were the preferred method of adopters; users of male condoms were the less likely to cease, users of traditional methods the most likely to cease. The model highlights the trade-off between the desire to comply to the traditional social norm of a large family and the desire to adopt a modern way of life corresponding to a smaller family.

Key words: fertility, life history, contraceptive trajectories, contraceptive method, contraceptive transition, modernity, tradition.

JEL Classification: J13, J18.

Resumen

La transición de la fecundidad en Colombia evidenciada desde mediados de los años 60, y la transición en el uso de anticonceptivos fueron procesos estrechamente vinculados con el comportamiento social. Modelos multinivel y multiproceso de historias de vida referidos al método escogido y al tiempo de utilización, permiten identificar los determinantes sociales de la anticoncepción. Las trayectorias individuales muestran varios períodos sucesivos de adopción y abandono del uso de anticonceptivos. Las mujeres más jóvenes muestran discontinuidad en el uso de anticonceptivos y el mayor aporte a la fecundidad total, sobre todo en las primeras edades reproductivas. Después de las generaciones pioneras de 1935-1940, y las generaciones de 1955-1959 y 1960-1969 mayores usuarias de anticoncepción, la generación de 1960-1969 usó anticonceptivos para espaciar los nacimientos. La anticoncepción estuvo estrechamente asociada con las condiciones materiales de vida, y la educación fue un determinante secundario. La preferencia por el sexo del hijo no fue un determinante del uso de anticonceptivos. Por otra parte, se examinó la influencia del tipo de método anticonceptivo sobre la inestabilidad en el uso, en qué medida un método particular puede ser utilizado por un período corto. La píldora y los condones masculinos fueron los métodos preferidos y las mujeres que los usaron tuvieron menores probabilidades de abandono, en contraste con

los métodos tradicionales que tuvieron las mayores probabilidades de abandono. El modelo permite evidenciar la compensación entre el deseo de tener familias grandes de acuerdo con la norma social tradicional, y el deseo de tener familias pequeñas de acuerdo con un estilo de vida moderno.

Palabras clave: fecundidad, trayectoria anticonceptiva, métodos anticonceptivos, transiciones de anticoncepción, modernidad, tradición.

Clasificación JEL: J13, J18.

Introduction

The transition of contraception use in Colombia was an important moment when health and fertility were tightly associated with social behavior. During its transition of contraception use, Colombia has conformed to the pattern observed in other countries (Steel and al., 1999; Steele and Curtis, 2003) that discontinuation of contraceptive practice becomes a major determinant of contraceptive prevalence and unwanted fertility. A feature of Colombian contraception was that women frequently changed their method of contraception: in the 2005 DHS, 50% of women using a traditional method (rhythm, withdrawal, or douching) ceased using it within the first year, mostly because of a pregnancy, planned or unplanned. This proportion was 47% for women using pill, 17% using IUD, and nearly 50% for other modern methods (foams, jellies, diaphragms) (DHS, 2005).

Ali and Cleland's study of contraceptive discontinuation (1999) omitted countries with a high proportion of sterilized women and thus excluded most countries of Latin America. Nonetheless, what can we say about Latin America countries to help guide family programs? We suggest to fill this gap in the case of Colombia. To do this, we shall use appropriate data-sets with longer retrospective insight than DHS surveys. In Colombia, women who chose sterilization usually did so after a history of no contraception or of use of reversible methods. This is why contraception use patterns deserve to be addressed in Latin America and specifically in Colombia.

The time at risk for adopting or stopping any contraceptive completes our knowledge on conflicted attitudes of Colombian women toward contraception and maternity, values, and social representation. A multi-level multi-process life history analysis of this time at risk shall highlight the determinants of this ambivalence. It will help us situate the Colombian case with regard to current theories of contraception. Notably, Davis and Blake (1956) and Bongaarts and Potter (1983) proposed that contraception methods that allow for individual options in decision-making would reduce growth in family size. This principle would be valid for countries across varying degrees of development. In addition, microeconomic theory (as represented by Becker, 1981) posits a trade-off between the costs and benefits of having children, where contraception would operate as a regulator of the demand and supply of children. In contrast, Caldwell (1982) emphasized heterogeneity in the fertility transition across less developed countries, with diffusion of contraception as an essential condition for changing values toward family, and a preliminary ideational revolution necessary for a general decline of fertility.

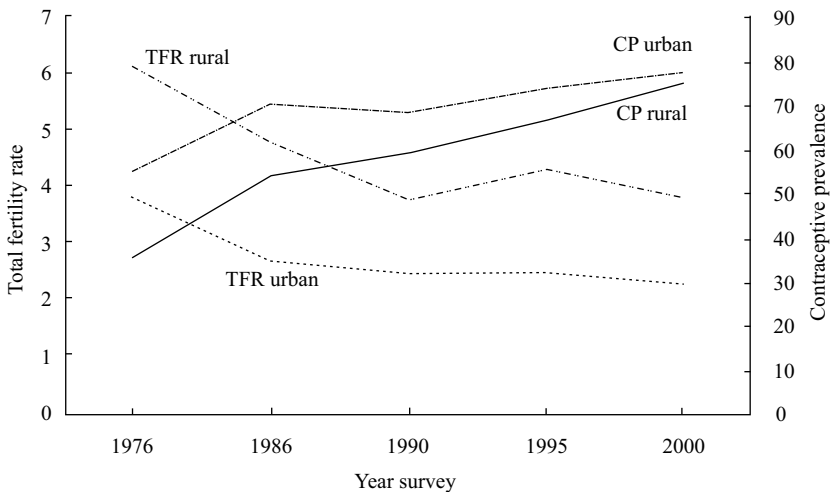
Our interest is then to understand how women adopted or ceased to use contraception. Discontinuation stands for the loss of anti-conception protection. Here, we study both ceasing (also termed discontinuation) and adoption. We shall focus on the transition between “use” and “non-use” of method (ceasing and adopting), rather than between modern and traditional methods. The switch between different methods without a spell of non-use, even between traditional and modern, involves too few women in the sample.

I. The context

We first situate the transition of contraception in Colombia with regard to the acceleration of fertility decline in cities compared to the countryside (Figure 1). The fertility transition has not eliminated the discrepancy between observed and desired fertility: 1986 DHS surveys show that the desired total fertility rate was 3.1 in rural Colombia compared to an actual observed fertility of 4.8. Corresponding figures were 2.7 and 3.8 in 1990, 2.8 and 4.3 in 1995, 2.3 and 3.8 in 2000, and 2.5 and 3.4 in 2005. Moreno and Goldman (1991) estimated probabilities

of contraceptive failure in Colombia in 1986 to be 7.7% for the pill, 5.3% for IUD, 24.8% for rhythm, 20.1% for withdrawal, and 23.6% for other methods. Similar figures were found in four DHS reports for Colombia (DHS 1990, 1995, 2000, and 2005). One consequence is that, between 1965 and 2005, the total fertility rate decreased from 7.0 to 2.4, which is low compared to other Latin American countries. In the last four decades, Bogotá has had the lowest fertility rate in the country and the highest rate of contraceptive use (WFS, 1976; DHS I, 1986; DHS II, 1990; DHS III, 1995; DHS+, 2000).

Figure 1. Contraception use* increases and fertility declines in trend.



* Current use married women.

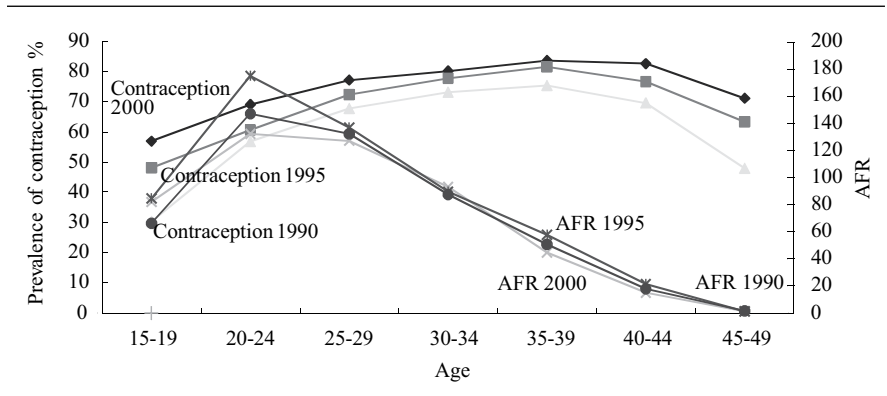
Source: Medina, based on EMF 1976, DHS 1986, 1990, 1995, 2000.

Since the 1970s, both private and public institutions in Colombia have maintained large contraceptive programs to meet increasing demand from women in the fertile ages. Over the last 40 years, the social and educational program known as PROFAMILIA has covered most aspects of family planning with clinics, distribution of contraceptives, information, and assistance especially for teenagers. The program is coordinated by the national Social Security system (*Sistema General de Seguridad Social*) (POPTCH, 1998), with external technical and financial help from the IPPF, USAID, UNFPA, and the Ministry of Public Health.

In most countries where a majority of women practice traditional methods (rhythm, withdrawal, and douching), the focus has been on the adoption of modern contraceptives. For example, Ferguson (1992) described the adoption of contraception, method switching, and discontinuation among women aged 25-34 in two rural areas of Kenya in 1987-90.

Observed differences in Figure 2 between the age-specific fertility schedule and the age-specific contraception schedule hint at parity-specific control: that contraception was used only after a certain parity had been achieved at a rather young age, without necessarily conforming to a model of stop-and-go. Prevalence of contraception was low under 20 years of age, and increased regularly during the twenties. As shown in Figure 3, female sterilization had increased, and since the 1980s had become the most popular contraceptive method, attaining 33% in 2000. While condom had also increased, it hardly attained 20% in 2000. The same pattern was true in the city of Bogotá except that IUD rather than sterilization had been the most used contraceptive. The pill has gradually declined in use.

Figure 2. Contraception and fertility by age in Colombia (all women, not only married women as in our dataset).

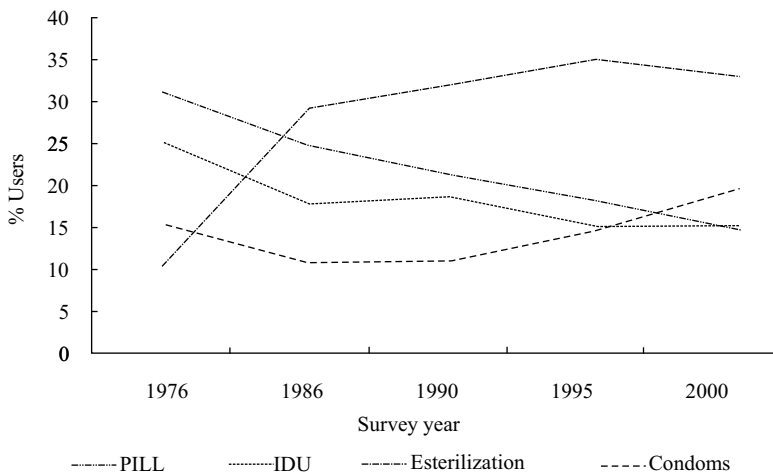


Source: Medina, based on DHS 1990, 1995, 2000.

In comparison to other Latin American countries, the Colombian fertility decline was one of the most dramatic between 1960 and 1985, after Chile, Cuba, and Costa Rica (Table 1). In 2000, Colombia was already much advanced in the fertility transition with low mortality

and moderate fertility. As our study will show, there were still much to improve in health and demographic matters, for example with regard to social status or to the discrepancy between city and countryside. Figure 4 compares the percentage of contraceptive users in Colombia to those in Brazil and Peru, where fertility had been more or less at the same level as in Colombia, and in Bolivia, where fertility had been remaining substantially higher from 1960 to 2000.

Figure 3. Methods of contraception in Colombia (all women, not only married women as in our dataset).

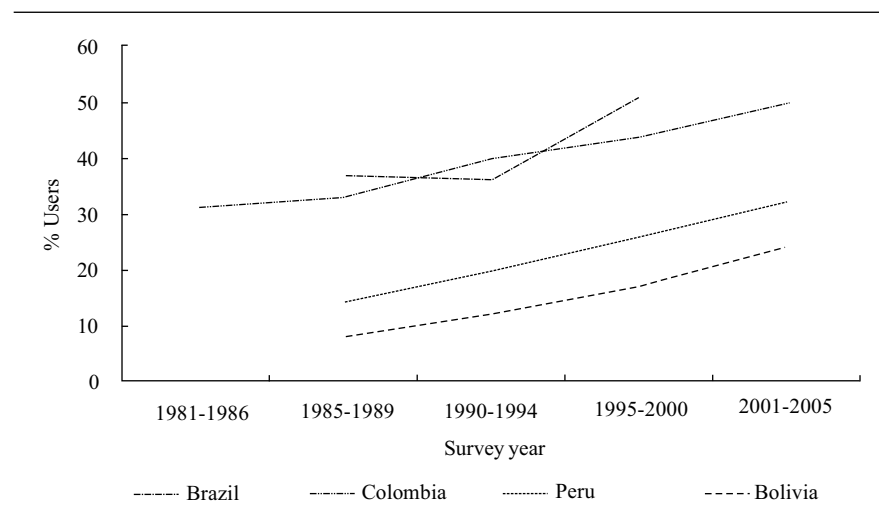


Source: Medina, based on EMF 1976, DHS 1986, 1990, 1995, 2000.

From Table 1 and Figure 4, the international comparison is coherent with the common sense association of lower fertility and higher usage of contraceptives. Table 2 even shows that among Peru, Brazil, and Colombia, the three countries for which discontinuity data are available, Colombia has had the lowest fertility and the lowest discontinuity rate; and the converse holds true for Peru and Bolivia. Table 2 also shows the high rate of turn-over between different methods of contraception, not only in comparison with other reasons of discontinuity, but also compared to Peru. Brazil in this matter resembles Colombia. Our study of Colombian contraceptive follow-up may bring answers to this instability with methods, an interesting point with regard to family planning. Table 3 also shows Colombia to resemble Brazil more than

Peru or Bolivia. A striking feature of Colombian contraception is the relatively high prevalence of the pill in 1986 (as in Brazil), but with a sustained decline until 2005. Declines of female sterilization and IUD, although less dramatic, are also visible in Colombia compared to the other countries (but IUD takes up again in 2005). Table 3 shows that the gradual abandonment of the pill is specific to Colombia. In all these countries, male contraception increases. We shall return to this phenomenon through our econometric analysis.

Figure 4. Comparison of percentages of contraception users in Latin American countries.



Source: DHS 1986, 1990, 1995, 2000, 2005.

Table 1. Total fertility rate in Latin American countries.

Country	1960	1985	2000
Argentina	3.1	3.4	2.4
Bolivia	6.6	6.3	4.4
Brasil	6.2	4.0	2.3
Chile	5.0	2.6	2.4
Colombia	6.7	3.6	2.8
Costa Rica	7.0	3.5	2.8
Cuba	4.7	1.8	---
Ecuador	7.0	5.0	2.1
Guatemala	6.9	6.1	4.9
Haiti	6.2	5.5	4.4
Honduras	7.4	6.5	4.3

Table 1. Total fertility rate in Latin American countries (*continued*).

Country	1960	1985	2000
Mexico	6.8	4.7	2.8
Nicaragua	7.3	5.9	4.3
Panama	5.9	3.5	2.6
Paraguay	6.6	4.9	4.2
Peru	6.9	5.2	3.0
Salvador	6.9	5.6	3.2
Uruguay	2.9	2.8	2.4
Venezuela	6.7	4.1	3.0
Dominican Rep.	7.3	4.1	2.9
Latin America	5.9	3.9	2.7

Table 2. Discontinuity rates of contraception in Brazil, Peru, and Colombia.

Country / survey year	Failed method	Desired pregnancy	Change of method	Other reason	Total
Brazil 1998	5.9	3.7	7.7	26.1	43.4
Colombia 2005	7.2	3.5	18.3	13.0	42.0
Peru 2000	6.2	4.0	24.0	14.7	48.8

Source: ORC Macro, 2007, Measure DHS Stat compiler www.measuredhs.com, April 2007.

Table 3. Comparison of the use of contraception methods in Bolivia, Brazil, Peru, and Colombia.

Country / survey year	Female sterilization	Male sterilization, condom, and withdrawal	Pill	IUD	Others
Bolivia 1989	0.5	3.3	1.7	6.5	22.8
Bolivia 1994	0.9	12.3	5.7	6.7	35.9
Bolivia 1998	1.5	18.1	7.7	7.1	26.7
Bolivia 2003	1.3	16.3	7.2	7.7	32.7
Brazil 1986(1)	13.9	5.1	36.2	2.1	9.3
Brazil 1991(2)	16.8	6.8	24.8	0.8	8.2
Brazil 1996	13.1	20.3	35.9	1.3	6.7
Colombia 1986	13.5	5.3	21.7	10.9	13.8
Colombia 1990	8.4	11.8	17.7	10.7	16.4
Colombia 1995	10.2	16.1	17.6	9.7	20.6
Colombia 2000	9.0	31.6	15.3	8.4	18.3
Colombia 2005	9.7	28.9	13.8	9.8	18.4
Peru 1986	3.7	2.6	4.0	4.4	13.3
Peru 1992	0.9	15.4	11.9	5.4	34.1
Peru 1996	2.3	22.8	9.6	6.8	34.2
Peru 2000	1.7	24.0	8.5	7.4	33.8

Source: ORC Macro, Measure DHS Stat compiler www.measuredhs.com, April 2007. (1) surveys of 15-44 year old women; (2) region Noreste.

II. Data and methods

In the DHS surveys, women are interviewed on their experiences over the preceding five years, which helps to limit recall bias (Ali and Cleland, 1999). Unfortunately, limiting contraceptive history to five years makes studying contraceptive transitions more difficult because these transitions are likely to unfold over a longer period of time. Moreover, a substantial proportion of older women are sterilized and their last five years of reproductive history are likely to be uninformative. Two reproductive life history surveys were conducted on married women to overcome this difficulty and cover the period from 1950 to 1994: *Impacto de la transición de la fecundidad en Colombia*, a retrospective life history survey conducted in 1984 in Bogotá and in the rural region of the *altiplano* Cundiboyacense by the *Centro de Estudios sobre Desarrollo Económico de Bogotá* (Florez, 1990), and *Trayectorias reproductivas de mujeres residentes en Bogotá* (Medina *et al.*, 1999) another retrospective survey conducted in 1994 in Bogotá by the Gillow Institute (Medina, 1999). Both surveys focused on urban women living in Bogotá and rural women living in the suburbs of Bogotá. These two populations were culturally close to each other, because 80% of immigration to Bogotá came from *altiplano* Cundiboyacense. Sensitive to the frailty of memory, information from each woman since age 15 was checked for consistency, for example by comparing histories of nuptiality and fertility, residence and work, education and relationship with the family. In case of inconsistency, women were re-interviewed (Medina, 1999, 2005). Around 8% of the original sample was discarded due to inconsistencies.

Together, the surveys contained 3116 women born between 1935 and 1979 (2005 women living in Bogotá and 1111 women living in rural regions of the *altiplano* Cundiboyacense). We could unite these two surveys because they include the same information on demographic events: migration history, marital history, education history, history of pregnancies and births, economic status, age, and residence. Both surveys concern women in fertile age, dwelling in Bogotá or in neighbor villages; the criteria of material condition are comparable. Each of these retrospective surveys include the initial and terminal times of demographic events, notably those of the period of contraception or those of the duration of marital union. They also both specify punctual

events, such as child delivery and the living status of the child born. Then both surveys have common object —contraception—, common collection and questioning procedures; they address populations of comparable age living in comparable areas. The fact that the surveys were conducted by different teams, and the fact that time precision differs —in Flórez *et al.* (1990) time is given yearly, and in Medina *et al.* (1999) quarterly— are superable. Spanning a larger and earlier time range than DHS, the concatenation of the two surveys brings the benefit of having information on women interviewed with over ten years' distance, offering us a unique insight into the longer time of the transition of contraceptive use.

The purpose of the model is to help us identify the significant determinants of discontinuity and adoption of contraception, in order to guide family planning; to clarify patterns of discontinuity and adoption, with their possible trends along generations and age, their possible opposition or overlapping between tradition and modernity, their possible hierarchy between socio-economic groups.

We study the duration of using a contraceptive until ceasing, and the duration of using no contraceptive until adoption of a contraceptive method. In the transition of ceasing a spell is defined as a period of use of a particular method, terminated by the ceasing of contraception, which is identified either by the declaration of the woman that she has ceased or by a pregnancy. A spell is then a continuous period of using a method, the switch between two methods being very rare (in the dataset, over 1642 women, only 19 changed from modern to traditional, and 25 from traditional to modern, without an intervening period of non-use), and resumption of use after a pregnancy begins a new spell.

For the transition of non use to adoption, a spell is defined as a period of non-use of any contraception, whether modern or traditional, and terminated either by adopting a method or by exit from the observation (censored data). We have retained only those women having begun their sexual lives and answered to the question of the date of first sexual intercourse —otherwise guessing at an age, say 15, is too inaccurate—, so the first spell is measured from the declared age of first sexual intercourse. The time spent in pregnancy is not counted

in the transition to adoption, time under risk is counted only while women are in need of contraception.

Table 4 presents the distribution of spells. In contrast to what Steele, Diamond and Wang (1996) found for China, many women in the sample had stopped or resumed contraception more than once. This suggests that the reasons why one stopped using contraception cannot be reduced to the desire of a pregnancy.

Table 4. Distribution of spells per woman.

Number of spells	Nb of women adopting contraception	Number of censored women	Total
in ceasing contraception			
1	569	89	658
2	481	48	529
3	222	29	251
4	94	13	107
5	40	9	49
6	23	3	26
7	9	3	12
8	3	2	5
9	3	1	4
11	1	0	1
Total number of spells	3036	433	3469
in adopting contraception			
1	124	1544	1668
2	120	670	790
3	76	345	421
4	29	144	173
5	10	46	56
6	16	21	37
7	4	10	14
8	2	8	10
9	0	2	2
10	1	2	3
Total number of spells	908	5023	5931

Source: Bonneuil, Medina, based on CEDE 1984; Guillow, 2000.

The descriptive statistics of co-variates $C^{i,s}$ and $X^{i,s}(t)$ are presented in Table 5. They include:

Variables constant for each spell:

- Material life condition (low, medium, high). Social status is taken from the official classification (Sise-dane, 1980, 1990) relying on the external quality of lodging and on the rent structure of the area

(Flórez, 1990; Medina, 1999) for city-dwellers, and from living conditions, land ownership, degree of isolation of the place of living, and economic resources for rural women;

- Age at first contraception;
- Age at marriage;
- Age at onset of the period at risk;
- Birth cohort (1935-40 urban and rural, 1955-59 urban and rural, 1960-69 urban, and 1970-79 urban);

Table 5. Descriptive statistics for the considered covariates.

Transition Variables	Ceasing		Adoption	
	Number of spells	Percentage of spells	Number of spells	Percentage of spells
Low material life condition	1700	36.0	2158	36.4
Medium material life condition	1499	31.7	1872	31.6
High material life condition	1531	32.4	1896	32.0
Start of the period of use less than 20 years old	2329	49.2	3265	55.1
Start of the period of use 20-24 years old	678	14.3	796	13.4
Start of the period of use 25-29 old	899	19.0	989	16.7
Start of the period of use 30-34 old	301	6.4	339	5.7
Start of the period of use 35 years old and over	523	9.1	537	9.1
Born 1935-40 rural	580	12.3	673	11.4
Born 1935-40 urban	1113	23.5	1408	23.8
Born 1955-59 rural	561	11.9	684	11.5
Born 1955-59 urban	1085	22.9	1512	25.5
Born 1960-69 urban	732	15.5	907	15.3
Born 1970-79 urban	659	13.9	742	12.5
0 years of education	349	7.4	433	7.3
1 year of education	200	4.2	252	4.3
2 years of education	547	11.6	721	12.2
3 years of education and over	3634	76.8	4520	76.2
0 child	775	16.4	2220	37.5
1 child	1097	23.2	1531	25.8
2 children	972	20.6	827	14.0
3 children and over	1886	39.8	1348	22.7
Variables varying in time				
	Mean	Sd.	Mean	Sd.
Duration of the spell	2.8	3.8	7.6	9.5
Age	25.8	7.7	24.7	8.5
Parity	2.5	2.2	2.2	2.3

Source: Bonneuil, Medina, based on CEDE 1984; Guillow, 2000.

Variables varying in time:

- Time elapsed since the beginning of the spell;
- Total number of children at present time;
- Proportion of male children (to test the preference for boys);
- Whether the last birth was a boy, a girl, or this birth was the first one (also to test the preference for boys);
- Total number of years of education;
- Method of contraception (pill, IUD, other modern, traditional) used during this period for the transition to ceasing;
- Method of contraception (pill, IUD, sterilization, other modern, traditional) used after this spell for the transition to adopting;
- Method of contraception (pill, IUD, other modern, traditional) used during the last period of use prior to this spell;
- Parity attained at present time (0, 1, 2, or 3 and over), or, alternatively, familial configurations: no children, one boy, one girl, one of each sex, two boys, two girls, and three or more children.

Table 6 shows that traditional methods prevailed among users of contraception (from Table 5, the proportion of women who resumed a traditional method is 86% vs. 61% for the pill, for IUD, and for other modern methods). Our econometric approach helps explain the reasons for this preference. The proportion taking the pill after IUD (17%)¹ was approximately the same as the proportion switching from pill to IUD (20%)², but the proportion of sterilization after IUD was higher (11%) than after the pill (4%).

¹ 59/(59+195+37+19+31) in Table 3.

² 98/(296+98+19+41+30) in Table 3.

Table 6. Frequency of spells between method used in the present contraception spell and method used in the previous spell of use.

Method used in the previous spell of use	Method used in the present spell of use					Total
	Pill	IUD	Sterilization	Other modern	Traditional	
Pill	296	98	19	41	30	484
IUD	59	195	37	19	31	341
Other modern	23	28	12	100	16	179
Traditional	17	30	12	14	450	523

Source: Bonneuil, Medina, based on CEDE 1984; Guillo, 2000.

A. Method: multi-level multi-process duration model

We use event history analysis (Cox and Oakes, 1984; Kalbfleish and Prentice, 1980) to study the two transitions. Each woman is followed from the moment of entry into the risk pool for either use or non-use of contraception. Diamond, McDonald and Shah (1986) found that little precision is lost by grouping durations into reasonably broad groups, and that computational time is reduced considerably. Time is known in months, and counted as fractions of years.

As noted by Steele, Diamond and Wang (1996) who studied the duration of contraceptive use in China in 1988, and by Steele and Curtis (2003) who emphasized the role of method choice in contraceptive discontinuation in Indonesia in 1997, a woman may experience more than one spell of contraceptive use over the observation period, and one must control for correlations between the outcomes of repeated spells of contraceptive use. The data thus have a two-level structure, with spells nested within women’s life histories, which suggests the use of a multi-level hazards model with random effects incorporated to allow for (time-invariant) unobserved heterogeneity between women (Curtis and Blanc, 1997; Steele and Curtis, 2003; Steele and Diamond, 1999; Steele *et al.*, 1999; Steele, Diamond and Wang, 1996).

The hazards defined as:

$$h^{i,s}(t) = \lim_{dt \rightarrow 0+} \frac{\Pr(t \leq T < t + dt / T \geq t)}{dt} \tag{1}$$

are expressed as piecewise linear log-hazard duration dependencies (Lillard, 1993; Panis, 1994; Lillard, Panis, and Upchurch, 1996;

Upchurch, Lillard, and Panis, 1996), or generalized Gompertz models. The hazard rate $h^{i,s}(t)$ is defined at duration t associated with spell s (level 2) nested within woman i (level 1).

However, as Curtis and Blanc (1997) and Steele and Curtis (2003) noted, the relationship between the method used and contraceptive discontinuation is complicated by the fact that method choice reflects trade-offs between a number of factors, including ease of use, risk of failure, intended length of use, and other characteristics of the women themselves that might also affect the risk of discontinuing use. These factors could lead to selection of women at high risk of discontinuation to use certain methods, which in turn would lead to bias in the determinants of contraceptive discontinuation. For this reason, we include the choice of the method to be taken as a covariate for women adopting a contraceptive, or the choice of the abandoned method for women stopping contraception. We follow the practice of Steele and Curtis (2003) who used multi-level multi-process modeling to show that the processes of contraceptive discontinuation and method choice should be modeled jointly. Individual random effects incorporated in each process are correlated across processes to allow for individual-level factors that influence both contraceptive discontinuation and method choice (Steele and Curtis, 2003). The model of probabilities then becomes:

$$\begin{cases} \ln h^{i,s}(t) = \gamma_1 'T^i(t) + \beta_1 'X^{i,s}(t) + \eta_1 'C^{i,s}(t) + \delta_1^i \\ \text{logit } P(C^{i,s}) = c = \alpha_1 'X^{i,s} + \zeta_1^i \end{cases} \quad (2)$$

for the transition to ceasing, and

$$\begin{cases} \ln h^{i,s}(t) = \gamma_2 'T^i(t) + \beta_2 'X^{i,s}(t) + \eta_2 'C^{i,s}(t) + \delta_2^i \\ \text{logit } P(C^{i,s}) = c = \alpha_2 'X^{i,s} + \zeta_2^i \end{cases} \quad (3)$$

for the transition to adopting.

Hazard rates $h^{i,s}(t)$ are a function of observed duration $T^i(t)$ since first entry into the risk. $\gamma_k 'T^i(t)$ captures the baseline hazard duration dependence. Hazard rates are also a function of $C^{i,s}$ representing

either the contraceptive used during the period at risk for the transition to ceasing, or the contraceptive used at the end of the period of non-use in the transition to adopting. $C^{i,s}$ is polytomous, and its value can be one of: pill, IUD, sterilization (for “non-use” to “use” only), other modern, and traditional methods. They are also functions of all other covariates $X^{i,s}$, including the contraceptive used in the most recent period of use preceding the period at risk.

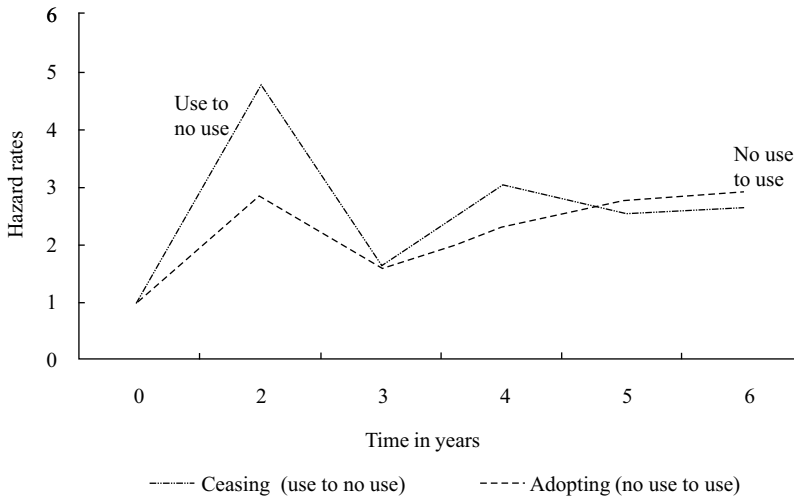
Hazard rates are also functions of the individual specific (time-invariant) random effects (unobserved heterogeneity) $\delta_k^i, \zeta_k^i, k = 1, 2$. The inclusion of $\delta_k^i, \zeta_k^i, k = 1, 2$ allows for correlation between the durations of repeated spells. It quantifies unobserved heterogeneity, resulting from respondent-specific unmeasured common factors, such as health status, attitudes, motivations, beliefs, fecundity variations across women. These terms are integrated out in hazard models, under the Gaussian assumption: $\delta_k^i \rightarrow N(0, \sigma_{\delta_k}^2), \zeta_k^i \rightarrow N(0, \sigma_{\zeta_k}^2), k = 1, 2$. Correlation terms between individual-specific error terms δ_k^i and $\zeta_k^i, k = 1, 2$ for each contraceptive $C^{i,s}$ are to be estimated.

As Steele and Curtis (2003) noted, the identification of a simultaneous equations model such as Eq. (2) or (3) usually requires at least one instrumental variable that, on theoretical grounds, is a predictor of the endogenous variable but not of the outcome of interest. However, as most women here contribute to two or more spells of contraceptive use or non-use, instruments are not required (Lillard *et al.*, 1995; Lillard and Panis, 2000; Upchurch *et al.*, 2002), and identification restrictions are not formally necessary (Sinha, Tanner, and Hall, 1994; discussion in Steele and Curtis, 2003). For any particular spell, other spells serve as instruments.

III. Results

The estimation of the two models (transitions to ceasing, and transition to adopting) was carried out using aML (Lillard and Panis, 2000). The baseline duration pattern $\gamma_k 'T(t), k = 1, 2$ in Eq. (2) and (3) reflects the dependence on time net of the effects of covariates and unobserved heterogeneity. It is represented in Figure 5. Non significant slopes were set to zero (but all are significant).

Figure 5. Baseline hazard rates of both transitions: ceasing and adopting. Colombian women contraception history 1950–1994.



Source: Bonneuil, Medina, based on CEDE 1984; Guillow 2000.

We interpret the regression results in the light of extensive qualitative interviews conducted by Medina on a sub-sample of fifty women taken at random in the 1994 retrospective survey by the Gillow Institute (Medina, 1999). These interviews concerned marital life, contraception, maternity, employment and educative projects. Three classes combining age, education, area of residence, and declared occupation were built. The fifty women were selected in respecting the necessity to have a sufficient number of women in each class, so that the interviews can give a hint at some representative opinion (although their number is not sufficient to be so, strictly speaking). Finally, among these fifty women, 22 were under 25; 7 were in the “high” class, 22 in the intermediate class (and 21 in the “lowest” class). These fifty qualitative interviews, although too few, help substantiate the numerical results with an appreciation of perceptions and attitudes of women which cannot be drawn from the data. As we shall see, the complementary interviews reveal themselves very consistent (fortunately!) with the numerical results obtained with the entire data set.

Net of all other effects, the risk of ceasing increased more quickly in the first year-and-a-half. This pattern is consistent with an initial phase

of experimentation: women who experienced difficulty changed early between use and non-use, contributing to a series of short spells (as also observed for China by Steele, Diamond and Wang, 1996). After two-and-a-half years, the risks of adopting and ceasing were similar. The initial phase was followed by a second phase where the risks in either direction stabilized at a lower level. Accordingly, the first phase of women who ceased contraception might include couples who planned a pregnancy (Steele, Diamond and Wang, 1996), or a transient experiment for those who adopted a contraception method. In the second phase, fewer women who used a contraceptive changed their contraception pattern. They were more likely to cease contraception to plan a pregnancy, which could explain the increasing hazard rate with respect to seniority in use. Those using no method would eventually turn to contraception after multiple abortions (Ruiz, 2002), which could explain the increasing hazard rate with respect to seniority in non-use.

Table 7 presents the results of the model for 1642 women having experienced 3469 spells at risk of ceasing contraception, and for 3174 women having experienced 5931 spells at risk of adopting contraception. A woman then experienced on average $3174/1642 = 2$ events of ceasing, and $5931/3174 = 1.8$ events of adopting contraception. These values give a rough idea of the turnover between use and non-use, but they include sampling error and unequal numbers of censored sequences.

Table 7 shows that the rural and urban birth cohorts of 1955-59 were significantly less likely to adopt and to cease than other cohorts. The 1935-40 cohort, forming the onset of the fertility transition, might be more hesitating; urban women born in 1970-79 more conflicted between contraception and maternity, acknowledging the importance of birth control while wanting children. The succession of the pioneer generation 1935-40, generations 1955-59 and 1960-69 mastering contraception and still attached to family, and the arrival of the generation 1970-79 which used contraception simply for spacing created this pattern of coefficients in Table 7 along with generations. The effect of this attitude toward contraception among women of recent cohorts was that the contribution of adolescent fertility has increased steadily from 1969 to 2005, for rural as well as for urban women, from 7.4% for the whole country to 16.7% in 2005 (DHS). The age at first birth

has decreased slightly from 23.2 years of age in 1985-89 to 22.7 in 1990-94 (DHS). This was made possible by ceasing contraceptive use for the young women, then, with increasing age, less ceasing and higher birth control. Contraception diffused across Colombian society since the 1950s, both by modern methods (notably IUD) and above all by sterilization, which increased since the 1970s. All told, the proportion of adolescent fertility increased while total fertility declined. This might reflect a lower need to control fertility, with more irregular sexual intimacy, or a larger ignorance of fertility control, but we lack the data to be sure.

The gradient of age coefficients at the beginning of the spell in Table 7 increases regularly. Women after 30 years of age were increasingly prone to adopting or ceasing than younger women. The gradient along age at the beginning of the spell in the associated logit model in Table 8 shows that older women were also those who chose traditional contraception rather than modern methods. Both gradients are then consistent to point out that older women did not trust modern contraception, and practiced traditional methods from time to time, perhaps alternating with diminished sexual activity after a few years of marriage.

A widespread belief was that contraceptives could have side effects such as congenital malformations or infertility, especially before the first pregnancy for younger women. Older women understood the pragmatic advantage of contraception in terms of cost and benefit of having children, personal education and employment projects, and in a more balanced relationship between spouses, notably in sexuality. The difficulty with contraception was that men appeared to feel loss of control over women's sexuality, leading women to avoid modern contraceptives and to prefer a combination of condoms and rhythm for preserving marital harmony. Similarly, vasectomy was thought to annihilate male libido, and to force men to take a definite decision on the size of the family. These persistent negative images of contraception explain women's aversion to method adoption in birth cohorts from 1955 to 1970. In contrast, maternity was viewed warmly, and many women in interviews reported wanting more children than they could afford. This affective disposition favored a reticent attitude toward contraception, and use ceased before an unplanned pregnancy. Pregnancies came from poor or non-use of contraceptives and inefficiency of traditional methods.

Table 7. Hazard model of the risk to cease using a contraceptive (3469 spells corresponding to 1642 women), and hazard model of the risk to adopt a contraceptive (5931 spells corresponding to 3174 women) (software aML).

Variable	Ceasing: From “use” of contraceptive to “non-use”		Adopting: From “non-use” of contraceptive to pregnancy or “use”	
	Coefficient	Sd.	Coefficient	Sd.
Intercept	-0.47	0.55	0.26	0.23
Born 1935-40, rural residence	-0.49	0.54	-0.13	0.12
Born 1935-40, urban residence	-0.33**	0.12	-0.08	0.09
Born 1955-59, rural residence	-0.79	0.54	-1.08**	0.12
Born 1955-59, urban residence	-0.43**	0.12	-0.90**	0.09
Born 1960-69, urban residence	-0.01	0.10	-0.40**	0.09
Born 1970-79, urban residence	0	reference	0	reference
Age at the beginning of the spell: under 20	-1.77**	0.14	-1.80**	0.21
Age at the beginning of the spell: 20-24	-1.33**	0.13	-1.49**	0.21
Age at the beginning of the spell: 25-29	-1.05**	0.12	-1.11**	0.19
Age at the beginning of the spell: 30-34	-0.54**	0.10	-0.56**	0.16
Age at the beginning of the spell: 35+	0	reference	0	reference
Low material life condition	0.17**	0.07	0.04	0.05
Medium material life condition	0.29**	0.07	0.10	0.06
High material life condition	0	reference	0	reference
Illiterate woman	-0.14	0.12	0.02	0.09
1 or 2 years education	-0.03	0.07	0.05	0.06
Over two years of education	0	reference	0	Reference
Parity	0.91**	0.05	0.71**	0.06
Parity × age × 10	-0.30**	0.02	-0.02**	0+
Last child is a son	2.04**	0.36	1.79**	0.47
Last child is a girl	2.01**	0.38	1.77**	0.45
No child yet	0	reference	0	reference
Last child son × age	-0.04**	0.01	-0.04**	0.02
Last child girl × age	-0.03**	0.01	-0.04**	0.02
No child yet × age	0	Reference	0	Reference
Contraceptive used <i>during</i> (ceasing)/ <i>after</i> (adopting) the spell: Pill	-0.87**	0.08	0.54**	0.08
Contraceptive used <i>during/after</i> the spell: IUD-	-0.63**	0.10	0.19**	0.08
Contraceptive used <i>during/after</i> the spell: sterilization	---	---	0.16	0.14

Table 7. Hazard model of the risk to cease using a contraceptive (3469 spells corresponding to 1642 women), and hazard model of the risk to adopt a contraceptive (5931 spells corresponding to 3174 women) (software aML) (continued).

Variable	Ceasing: From “use” of contraceptive to “non-use”		Adopting: From “non-use” of contraceptive to pregnancy or “use”	
	Coefficient	Sd.	Coefficient	Sd.
Contraceptive used <i>during/after</i> the spell: other modern	-2.18**	0.12	0.33**	0.09
Contraceptive used <i>during/after</i> the spell: traditional	0	reference	0	reference
Contraceptive in the <i>previous</i> spell of use: Pill	0.46**	0.10	0.23**	0.08
Contraceptive in the <i>previous</i> spell of use: IUD	-0.04	0.10	0.14	0.08
Contraceptive in the <i>previous</i> spell of use: other modern	0.04	0.14	-0.02	0.08
Contraceptive in the <i>previous</i> spell of use: traditional	0	reference	0	reference
Unobserved heterogeneity standard deviation	0.14**	0.04	0.26**	0.04

** means significant at 5%, * at 10%, “---” means “irrelevant”.

This situation was exacerbated by material life condition, as Table 7 shows: women of low and medium material life conditions were more likely than women of high material life condition to cease contraception. Material life condition is classified in three classes, according to standard of living, occupation, and income. Women of high condition were comparatively the most unwilling to cease contraception. These women tended toward smaller families through controlled reproduction, probably in order to combine family life with career projects. As a common step in development, contraceptive use was first adopted by the wealthy. One might speculate that maintaining contraceptive use would be associated with women obtaining satisfactory efficiency.

This efficiency depended on the correct use and could be related to education. Illiteracy is generally believed to lead to a misuse of contraceptives and to unplanned pregnancy. Education and medical control of young women are normally necessary to promote longer and more efficient periods of use. However, education does not appear significant in Table 7, which is a challenge for family planning programs. It

seems to be confounded by the effect of material life condition, which reflects the education of the husband (Ali and Cleland, 1999, similarly found no influence of education on ceasing contraception, except in the very particular case when husband's education has no influence; Moreno, 1993, identified the length of contraceptive episodes as "the genuine exception of strong effects of schooling on nearly all types of demographic outcome").

If education played no role in the transitions to ceasing and to adopting, it intervened in the choice of the contraceptive, as the significant negative coefficient for illiteracy shows in the logit model presented in Table 8: illiterate women were less likely than others to use a modern contraceptive compared to traditional methods.

Table 8. Multinomial logit model of the mode of contraception (Pill, IUD, other modern, sterilization, and traditional (as reference)), associated with the hazard rate model of Table 7 (software AML).

Variable	Method choice during the spell of use: pill/IUD/modern/traditional associated with ceasing (3 equations with same coefficients)		Method choice after the spell of non use pill/IUD/modern/sterilization/traditional associated with adopting (4 equations with same coefficients)	
	Coefficient	Sd.	Coefficient	Sd.
Intercept	-7.38**	0.82	-4.17*	0.46
Born 1935-40, rural residence	0.33	0.76	-0.07	0.35
Born 1935-40, urban residence	-0.38	0.22	0.10	0.19
Born 1955-59, rural residence	-0.99	0.80	-0.71	0.40
Born 1955-59, urban residence	0.35	0.19	-0.06	0.21
Born 1960-69, urban residence	0.11	0.16	0.52	0.21
Born 1970-79, urban residence	0	reference	0	reference
Age at the beginning of the spell of use: under 20	2.30**	0.29	0.72**	0.27
Age at the beginning of the spell of use: 21-25	1.20**	0.27	0.65**	0.27
Age at the beginning of the spell of use: 26-30	0.70**	0.24	-0.05	0.26
Age at the beginning of the spell of use: 31-35	0.50	0.26	0.56**	0.28
Age at the beginning of the spell of use: over 35	0	reference	0	reference
Low material life condition	-0.80**	0.14	-0.45**	0.16
Medium material life condition	-0.77**	0.13	-0.46**	0.18
High material life condition	0	reference	0	reference

Table 8. Multinomial logit model of the mode of contraception (Pill, IUD, other modern, sterilization, and traditional (as reference)), associated with the hazard rate model of Table 7 (software AML) (continued).

Variable	Method choice during the spell of use: pill/IUD/modern/traditional associated with ceasing (3 equations with same coefficients)		Method choice after the spell of non use pill/IUD/modern/sterilization/traditional associated with adopting (4 equations with same coefficients)	
	Coefficient	Sd.	Coefficient	Sd.
Illiterate woman	0.11	0.30	-0.44	0.28
1 or 2 years education	-0.42**	0.15	-0.17	0.11
Over two years of education	0	reference	0	reference
Parity	-0.04	0.03	-0.08**	0.04
Last child is a son	-2.18**	0.21	0.21	0.16
Last child is a girl	-3.05**	0.29	0.22	0.17
No child yet	0	reference	0	Reference
Contraceptive in the previous spell of use: Pill	-0.19	0.20	---	---
Contraceptive in the previous spell of use: IUD	-0.02	0.22	---	---
Contraceptive in the previous spell of use: sterilization	---	---	---	---
Contraceptive in the previous spell of use: other modern	-0.21	0.29	---	---
Contraceptive in the previous spell: traditional	0	reference	---	---
Standard deviation with <i>pill</i>	4.80**	0.28	2.03**	0.17
standard deviation with IUD	4.02**	0.27	1.91**	0.15
standard deviation with <i>other modern</i>	3.06**	0.23	1.82**	0.12
Correlation hazard model with logit response <i>pill</i>	-0.18**	0.02	-0.95**	0.02
Correlation hazard model with logit response IUD	-0.17**	0.03	0.27**	0.02
Correlation hazard model with logit response <i>other modern</i>	0.61**	0.06	-0.28**	0.04
Correlation logit response <i>pill</i> with logit response IUD	-0.15**	0.03	-0.09**	0.02
Correlation logit response <i>pill</i> with logit response <i>other modern</i>	-0.41**	0.07	-0.07**	0.03
Correlation logit response IUD with logit response <i>other modern</i>	-0.11**	0.06	0.53**	0.06

** means significant at 5%, * at 10%, “---” means “irrelevant”.

In Table 7, women with higher parity were more likely to change, be it for ceasing or adopting, but less and less so with age, and this conservative attitude accelerated with age and parity, as the negative coefficients associated to parity crossed with age testify. Older women who were less likely to adopt might become naturally sterile or space sexual intercourse, and so no longer needed contraception; older women who were less likely to cease might fear a late pregnancy, especially when parity was already high. In qualitative interviews (Medina, 1999), women reported fear of side effects. Even women with several children remained diffident toward health services, and complained that they were not given the necessary accessories or were not taught the correct use of the method. For example, IUD had the reputation of inefficiency, oral contraceptives had the most negative image of disturbing the reproductive and circulatory systems, traditional methods were regarded as insecure and uncomfortable, irreversible methods were considered to be inappropriate, except for women who did not want any child anymore (but most were undecided). A pill, even a IUD, works only if used correctly, which depends on the user as well as on the competence of the family planner (Leite-Ribeiro, 1971). A contraception method must reflect the real wishes of the woman, whose attitudes may be difficult to discern. Although no method was thought to be satisfactory, and the existing supply was believed to be both inefficient and insufficient, which was attested by frequent ceasing and adopting, the negative coefficient of age shows that dissatisfaction was attenuated with age, or that satisfaction increased, as each woman learned what worked for her.

The sex of the last child born confirms the role of parity (all coefficients of the sex of the last child born are positive, and the crossed effects, which are negative, suggest that this effect waned with age, but with values too small to counterbalance at young ages), but the pair-wise likelihood ratio tests in Table 9 show that the coefficients of “last child is a boy” are not significantly different from those of “last child is a girl” in both transitions. We computed the crossed effects of age and sex of the last child (Table 7) to detect a possible non additive effect implying a sex preference, but the two coefficients of interactions are not significant from each other in either transition. We conclude that there was no substantial sex preference. We also examined the proportion of boys in the total parity as an alternative covariate (not in Table 7).

It is correlated with the sex of the last child, and the result is the same. Whichever variable is used, the data show no sex preference.

Table 7 shows that women adopting contraception were more likely to try the pill or other modern methods (not significantly different from each other, Table 9) compared to IUD, sterilization, and traditional methods; women most likely to cease contraception were using traditional methods, those using other modern less likely than those using the pill or IUD. This result again reveals the willingness of women to adopt modern contraceptives, but that pill and IUD eventually did not match their expectations, compared to other modern methods. Women were reluctant to take contraceptives on a day-to-day basis. Women with modern methods were more likely to stick on them, a strong result confirmed by Figure 3 showing the rise of male condoms and the decline of IUD and pill. The favored methods were thus those that did not require specific behavior changes, or traditional methods which necessitate no regular intake or preparation, such as withdrawal or, which is not counted as a traditional method, prolonged lactation. Traditional methods were then gradually superseded by modern methods supported by family planning agencies.

Table 7 also shows the influence of the method used in the previous spell of contraception. It suggests that women with pill in the previous period were more likely to cease contraception in the present period, compared to other methods. Former pill takers returned also more easily than others to contraception after a period of non-use.

The significant standard deviation due to unobserved heterogeneity in Table 7 captures characteristics of women beyond the available variables, and its presence improves the estimation of the other coefficients, as women experienced repeated spells. It shows that a significant amount of variation between women remained unexplained by covariates in the model.

A logit model with coefficients of co-variates different for each method choice did not converge, so we are content with a single model for all method choices, but with different correlations for each method choice and the hazard model, and with correlations between method choices, which is a decisive step toward taking into account the endogenous

feature of the choice of the method. The significant correlations of the logit responses with the hazard model in Table 8 confirm that the estimation of the hazard model is improved when it is estimated together with the logit model. The significant correlations between the responses in Table 7 confirm that the contraceptive methods are not independent.

Table 9. Likelihood ratio of pair-wise equality between coefficients (with degrees of freedom in parentheses).

Variables	To ceasing	To adopting
Material life condition: Low /Medium	2.4**(1)	0.9(1)
Born 1935-40 rural/urban residence	0.3 (1)	0.3(1)
Born 1935-40 rural/1955-59 rural residence	8.9**(1)	35.1**(1)
Born 1935-40 rural/1955-59 urban residence	0.1 (1)	9.9**(1)
Born 1935-40 rural/1960-69 urban residence	2.3 (1)	0.3(1)
Born 1935-40 urban/1955-59 rural residence	4.1**(1)	19.1**(1)
Born 1935-40 urban/1955-59 urban residence	1.9(1)	29.5**(1)
Born 1935-40 urban/1960-69 urban residence	9.4**(1)	0.7(1)
Born 1955-59 rural /1955-59 urban residence	3.3 (1)	3.4(1)
Born 1955-59 rural /1960-69 urban residence	13.9**(1)	20.3**(1)
Born 1955-59 urban /1960-69 urban residence	0.7 (1)	37.8**(1)
Last child is a boy / is a girl	3.7 (3)	1.1(3)
Traditional/modern method in the ... spell where a birth occurred	8.1**(1) (current spell)	7.1**(1) (next spell)
Illiterate / primary education	1.5(1)	0.2(1)
Age at the beginning of the spell of use: under 20 / 21-25	7.7**(1)	28.1**(1)
Age at the beginning of the spell of use: under 20 / 26-30	7.1**(1)	32.3**(1)
Age at the beginning of the spell of use: under 20 / 31-35	7.6**(1)	32.1**(1)
Age at the beginning of the spell of use: 21-25 / 26-30	8.7**(1)	15.6**(1)
Age at the beginning of the spell of use: 21-25 / 31-35	8.8**(1)	16.0**(1)
Age at the beginning of the spell of use: 26-30 / 31-35	7.2**(1)	6.7**(1)
Method during/after the spell: Pill / IUD	20.8**(1)	12.5**(1)
Method during/after the spell: Pill / sterilization	---	6.8**(1)
Method during/after the spell: Pill / other modern	31.1**(1)	3.3(1)
Method during/after the spell: IUD/ sterilization	---	0.1(1)
Method during/after the spell: IUD/ other modern	14.7**(1)	2.1(1)
Method during/after the spell: sterilization/ other modern	---	1.2(1)
Method in the previous spell: Pill/IUD	6.1**(1)	0.9(1)
Method in the previous spell: Pill/other modern	4.5**(1)	12.4**(1)
Method in the previous spell: IUD/other modern	0.3(1)	8.7(1)

** means significant at 5%, * at 10%, "---" means "irrelevant".

IV. Conclusion

Increasing the quality of family planning services requires better knowledge of the process of changing contraception habits and their determinants. This was our project for Colombia, relying on surveys covering a larger time span than DHS surveys and corresponding to the transition of contraception use in this country. Using a multi-level hazard model with unobserved heterogeneity and coupled with a logit model to make the choice of the contraception method endogenous, we highlighted duration patterns of the risk to adopt or cease contraception, net of all other effects: women showed some versatility during the first two years after beginning a spell of use or of non-use, then the risks of adopting or ceasing stabilized at a lower level, corresponding to decisions of planned pregnancies.

We showed that the attitude toward contraception varied along with generations, a result which was made possible by the larger retrospective time span of the surveys, compared with DHS: after the pioneer generation of 1935-40, the conservative generation of 1955-59 and 1960-69 mastering contraception and still attached to family, the generation 1970-79 used contraception simply for spacing. We compared and contrasted women of low and medium material life condition who were quick to cease contraception, with women of high condition sticking to contraception. We revealed the subtle effect of acquired parity: women were less likely to adopt contraception after two children and most likely after the third child—which was consistent with the high level of sterilization after the third child. We found no evidence of sex preference in both risks to adopt or to cease.

We also delineated the hierarchy of contraceptive methods, characterized by the higher risk of ceasing when using a traditional method, a lowest risk of ceasing when using other modern methods compared to the pill, IUD, and of course traditional methods. These results testify that couples were torn between the desire for large families and the desire to adopt a modern way of life, between the willingness to control one's parity and the fear of side effects, and the lack of enthusiasm for taking a pill every day. We saw that this attitude was exacerbated at young ages, with the proportion of adolescent fertility increasing, accompanied by frequent ceasing and adopting of contraceptive, while

total fertility decreased in time, notably because of sterilization at older ages (at the end of fertile life, every other woman was sterilized). Family formation came ever earlier in women's life course. Certainly, difficulty of contraceptive use played a part in this phenomenon, but we are inclined to think that the social model of early family formation was responsible for the frequent ceasing and adopting at young ages, followed by higher contraceptive use when the family was already constituted, guaranteeing social status to women.

Because of the easy provision of contraceptives, Colombia has achieved its contraception transition, but remains an exemplary case study where couples oscillated between no method at all and attempts with contraception. Opinions toward fertility and toward the role of the woman in the couple and in society are a key target for family planners. Targeted groups are the poor and the rural, female teenagers and men who take no part to contraception; themes are the inefficiency of traditional methods and the safety of the pill. After Moreno (1993) and Ali and Cleland (1999), we confirmed that education took no role in the adoption of a contraceptive method, only in the choice of the contraceptive with traditional methods preferred by poorly educated women and modern ones by better educated women. Women reacted more to material life condition than to education. How to convince poorer women to adopt contraception, and if so, modern contraception? Explanation, propaganda, counseling encounter a deep ideational structure in rural poor women; the technological sophistication of contraceptives feeds into a suspicion in deleterious physiological side effects and on the conflicted attitude of these couples toward fertility and perhaps more importantly toward the role of the proof of male and female fecundity in self-esteem and stability of the couple.

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