BIRTHSPACING AND FERTILITY DECLINE IN COSTA RICA

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Abstract.

This paper uses data from the Latin American Comparative Fertility Surveys as well as from the World Fertility Survey to study trends and differentials in birthspacing among ever married women in Costa Rica during the period 1945–1974. A good deal of attention is placed on the pace of fertility in threshold, early and late stages of the fertility decline that this country experienced during the sixties and early seventies. The results show a good deal of similarity in the tempo of reproduction across parities and geographical areas. However, an analysis of the background variables affecting birthspacing shows differences between urban and rural zones. Finally, it is postulated that the recent plateau in period rates may be a consequence of changes in the tempo of family building, with women at low parities having their postponed births now, offsetting the trends of decline generated among women at higher parities who still may be curtailing reproduction.

1 Introduction.

This paper analyzes the trends and differentials in the tempo of fertility among Costa Rican women.

This country began to experience significant changes in reproductive levels in the early sixties and the decline in the following years was comparable in speed and magnitude to that documented for Taiwan and Korea (graph 1) (Stycos, 1978. Rindfuss et al., 1982. Davis, 1984.). Nevertheless, recent data also shows that the rapid decline in period rates came to an end by the mid–seventies and a stage of relative stability followed the quick change of the previous years (Gendell, 1985).

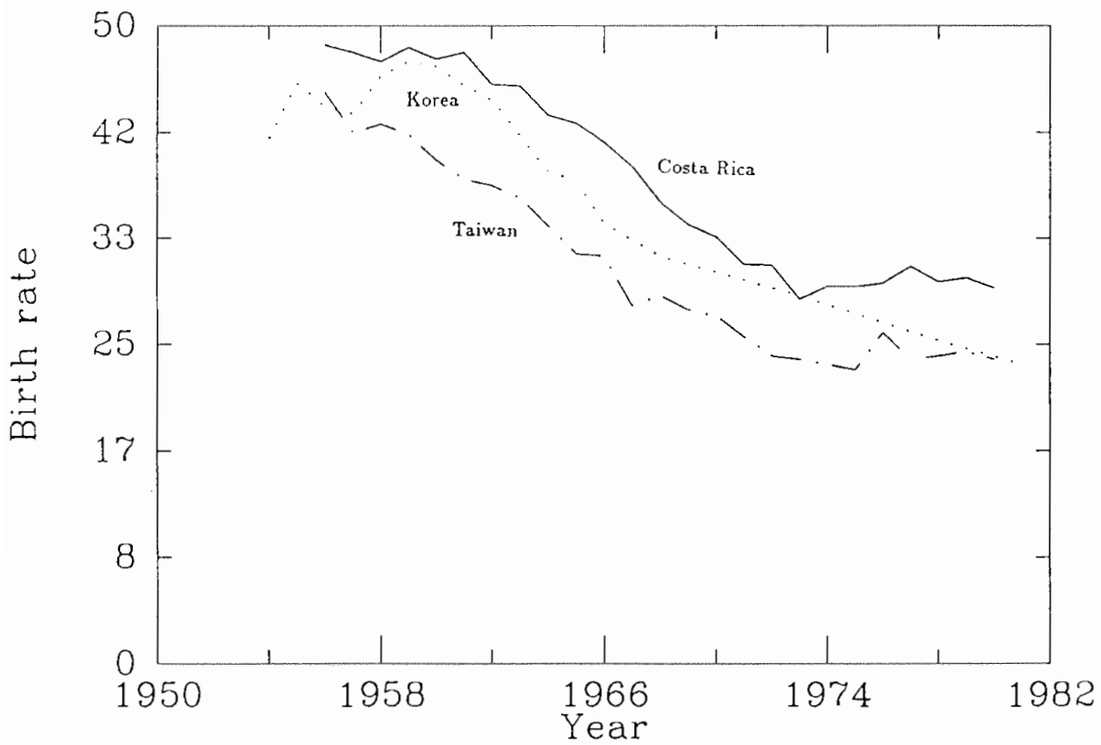
Most often reproductive change begins among relatively older women at high parities who want no more children. The idea is that "Most married couples who limit the number of children they have, concentrate their childbearing in the earlier part of the wife's fertile period. Once the couple achieve their desired family size efforts are made to prevent further births and, as a consequence, marital fertility rates are particularly low at older ages (Knodel, 1977)." However, this pattern need not always be found. If a society is experiencing major social changes, including a sustained increase in schooling and enhanced expectations of participation in the labor market of new generations, both older and younger women have reasons for changes in family building practices.

From this perspective, a rapid decline may occur because of the combination of two forces: the desire to bring reproduction to an end among women who reached their reproductive goals, reinforced by the temporary effect of postponement of fertility among women at low parities. Later on, a slowing of the decline or even a period of relative stability of birth rates may be observed as a result of compensating effects of cessation of fertility among women at high parities and the realization of fertility of women who postponed births in the past. In such a case there would be no grounds to believe an attrition of the causes of reproductive change, nor has there been mention in the case of Costa Rica of a stalling in fertility levels because of a weakening of the family planning effort (Gendell, 1985).

Most of what has been written about fertility decline in Costa Rica has been largely based on the trends in period rates or at the most on the aggregate number of births occurring over the span of a synthetic cohort (Gonzalez, 1977; Stycos, 1984; Gomez, 1982). The interest of the present study centers on the tempo of family building in the hope of providing an additional perspective for the interpretation of trends and the explanation of the hiatus observed in the fertility transition.

Data currently available does not permit a full test of the foregoing ideas in their full extent. For this reason the paper is limited to the study of birthspacing patterns as fertility change from predecline high levels to the threshold of stabilization, both in urban and rural areas of Costa Rica. In the second part, the analysis is extended to the study of socioeconomic differentials in birthspacing practices that may exist before, during and in the late stage of reproductive change. Thus, it is hoped to provide enough evidence to justify a follow up study of the topic with more recent data.

Graph 1. Crude annual birth rates in Costa Rica, Korea and Taiwan.



Sources (appropriate years):
For Costa Rica and Korea: United Nations. Demographic Yearbook.
For Taiwan: Ministry of Interior. Taiwan-Fukien Demographic Fact Book. Republic of China.

2 Data sources and methodology.

2.1 Data.

This paper relies heavily on the 1976 investigation that was carried out as part of the World Fertility Survey. However, in order to have an overview of the trends in birthspacing farther back in the past, the Metropolitan Fertility Survey of 1964 and the Rural Fertility Survey of 1969 were also used.

The second survey was carried out as part of a comparative fertility study coordinated by CELADE in some Latin American capital cities in the 1960's. By this time a large part of the Costa Rican urban population lived in the metropolitan conglomerate, and for this reason the 1964 study is assumed to be fairly representative of urban zones. The 1969 investigation was comparable with the former, but concerned only with the rural sectors of the country.

Although the expected efforts have been made to improve comparability, the results of these surveys, spanning over a number of years, reflect the changing emphases in fertility research. Though the investigations have similar sample design, briefly described as multistaged clustered equi-probability samples, they differ in their content and, to some extent, in the quality of data collected. Most important, differences in question wording and questionnaire design may also affect comparability.

2.2 The target population.

Marriage seems to be a logical starting point for analysis of trends in birthspacing. However, the fact that the surveys were not limited to married women recognizes that, as in many other countries, an important component of fertility occurs out of wedlock in Costa Rica. Fertility levels are still overwhelmingly dominated by what happens within marriage, so the present concern is limited to studying the pace of fertility among ever–married women. In the case of the interval between marriage and first birth the analysis includes only those events in which the first birth occurs after marriage. For parities one and above, all ever-married women are included in the analysis.

2.3 Methodology.

It is customary in cross-sectional surveys to obtain information only from women in the childbearing years. This practice makes the data in pregnancy histories and any retrospective information reflect only partially the past reproductive experience of the whole population, with the picture obtained being less representative as the events are farther away from the date of the survey.

The approach that is followed here to overcome this limitation is described in detail by Rindfuss et al. (1982). Basically, it consists of restricting the analysis to a subset of the events recorded in the birth histories. For example, focusing only on women who had their first child before reaching 29 years of age would allow to make uniform comparisons since the year 1955 with the data of the 1976 survey (WFS). Similar restrictions on earlier surveys would permit tracing the pace of fertility before and during the fertility decline and as recently as the threshold of stabilization at lower levels in mid-seventies.

This methodology will capture a large proportion of births of lower order. In order to maintain representativeness for higher parities, the period of observation is reduced to include the fertility experience of older women. Taking as a reference the 1976 survey, increasing the age of sample to women 34 years allows the study of birthspacing practices for events since 1960. The following scheme abstracts for each parity the age of women and years within which cohorts are subsequently defined for the analyses.

Parity	Age	1964 survey	1969 survey	1976 survey
0 (Marriage)	< 29	≥ 1943	≥ 1948	≥ 1955
1–2	< 29	≥ 1943	≥ 1948	≥ 1955
3–4	< 34	≥ 1948	≥ 1953	≥ 1960
5 and up	< 37	≥ 1951	≥ 1956	≥ 1963

The procedure used to trace the changes in birthspacing practices documents for a parity cohort the cumulative proportions of women having another birth at successive times elapsed since the parity was reached. These calculations are carried out with the aid of life table techniques, taking into account the censoring that ocurrs for those women who have not experienced another birth at the time of the survey. For women with five or more children all birth events were pooled, just as if beyond this number of children spacing practices were parity independent. This simplification does not likely introduce major distortions to the results.

Since only a few births occur yearly to the women in the sample, annual life table estimates for

each parity cohort would be rather unstable. With this problem in mind, three-year overlapping cohorts were defined (for example 1955-57, 1956-58, etc.) with results resembling moving averages with contiguous cohorts having two–thirds of the cases in common.

3 General trends in birthspacing.

3.1 General trends in birthspacing by parity.

The proportions of women having another birth within 24 months since the previous child have been plotted in graphs 2 and 3 for urban and rural areas, respectively.

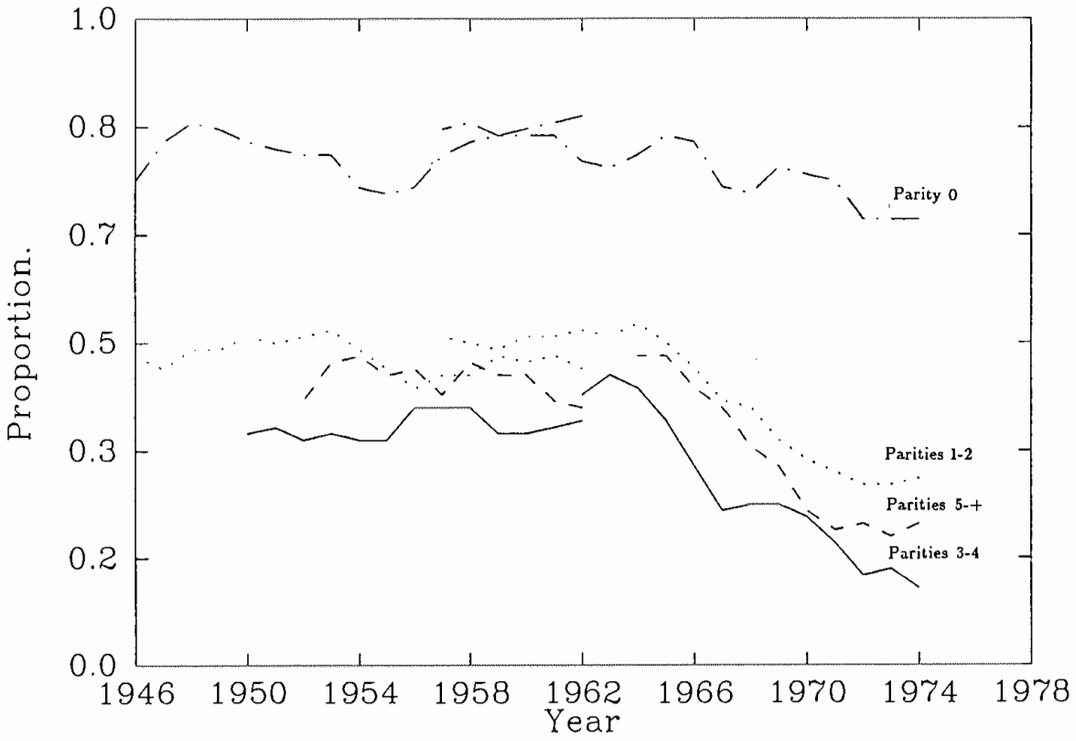
Overall, the graph demonstrates considerable similarity across all parity levels with a few important differences. While in urban areas the proportion of women having their first child within 24 months since marriage has remained roughly constant since the late forties, in rural areas there is a suggestion of an increase up to the early sixties. Considering the trends in the other parity groups, the peak in period fertility reached in the 60's may have been caused, at least partially, by an increase in the proportions of rural women having the first birth within the first year of marriage.

This stability of the trends for the interval between marriage and first birth contrast with those reported in similar analysis for Korea (Rindfuss, et al. 1982). In this case, a consistent increase in the pace of fertility was observed at initial parities (0,1). This pattern was interpreted as an effect of an increased prevalence of premarital pregnacy resulting from "... changing social meaning of marriage, and changes in the time, relative to marriage, when sexual relations begin, rather than some change in fecundability," as well as changes "...perhaps in coital frequency." By comparison, in Costa Rica arranged marriages were seldom of any importance and the stability of the trends does not suggest that coital frequency has changed enough to produce a discernible impact.

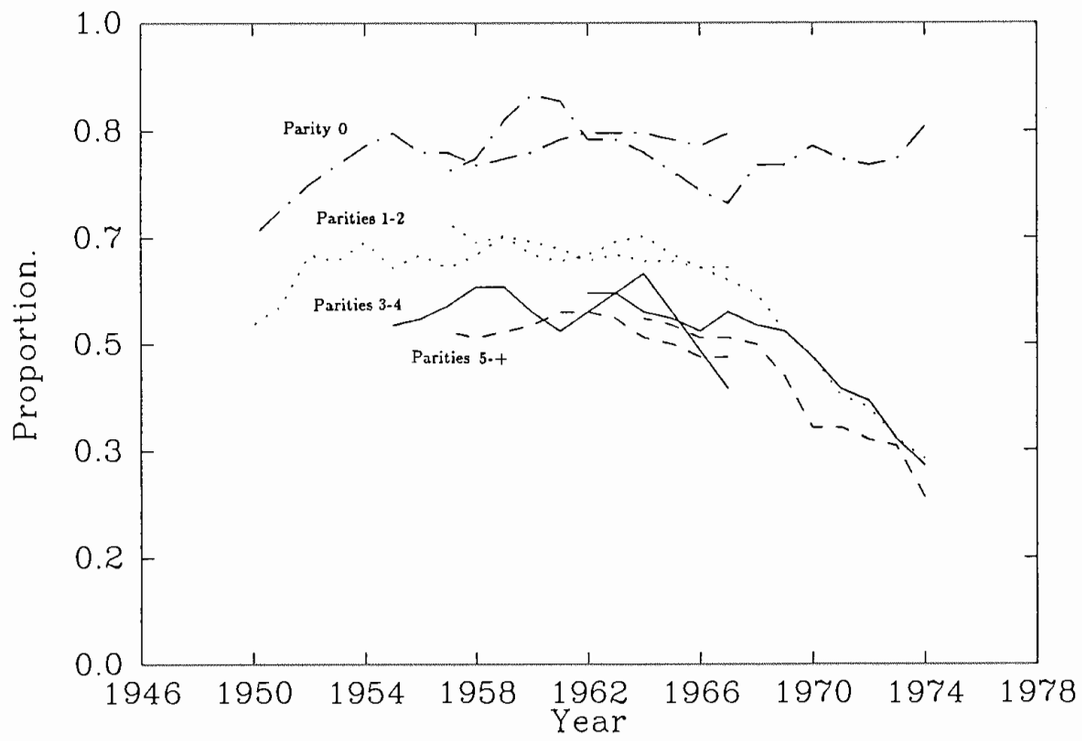
The relative levels of the data series plotted deserve some attention. Suppose for a moment that couples become more conscious of family limitation as actual family size increases, in a sort of cohort inversion process (Hobcraft, et al., 1982). To the extent that parity dependent contraceptive effort succeeds, it would imply smaller proportions having an additional birth within a given time span since the previous child as family size increases.

This kind of behavior is observed up to parity 4 in urban areas. Parity 5 does not fit in the expected sequence since its levels are actually higher than those corresponding to women with 3–4

Graph 2. Proportion of urban women having birth 24 months since the previous event (marriage, birth), by parity.



Graph 3. Proportion of rural women having birth within 24 months since the previous event (marriage, birth), by parity



children. It may be argued that this is so because women at higher parities are in some way a selected group, i.e., more fecund, less successful contraceptors, etc.

During the pre-decline period, trends in rural zones conform better with the initial idea of dispersion in the proportion of women achieving the next parity within a given interval and lines, although being close, are in the order expected. However, after 1966 there is a convergence in the trends corresponding to parities 1–2 and 3–4.

It is interesting to analyze the trends in family building over a longer time span elapsed since the previous birth. Over 20 months the changing patterns combine deferred fertility with the reproductive behaviour of women who do not want more children, and therefore the question arises of the final proportions who will ever have another birth. Though these values cannot be observed for a sample of women in the childbearing ages, it has been suggested that a sufficiently long interval since the last birth can provide a reasonable estimate. Rindfuss and Bumpass (1982) suggest sixty months for parities 3 and above. Hobcraft and McDonald (1984) called this quintum of fertility by its reference to five years. It should be noted that although this index seems reasonable in higher fertility societies where births come very close to each other, a word of caution is in order since it may become inadequate with lower fertility and greater use of contraception, with couples able to plan births over longer time spans.

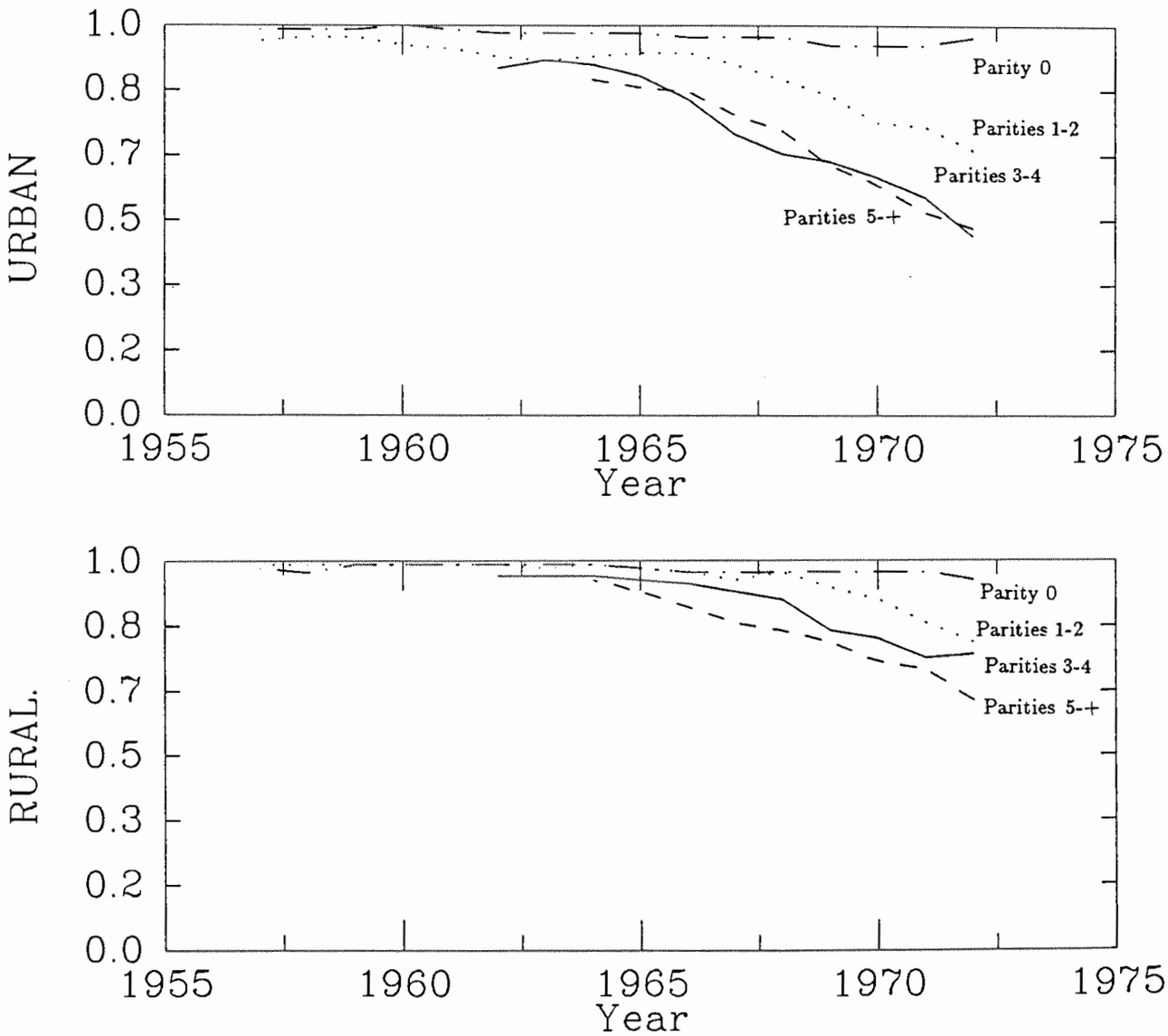
The proportions of women advancing to the next parity within five years since the previous birth have been plotted in graph 4. It is clear that the transition between marriage and first birth has remained quite stable over the years, and does not reach unity because of subfecundity. If the 60 months span gives an adequate idea of the fertility finally realized, it is clear that couples try to avoid childlessness, but also the downturn observed for paritiy one and above implies a definite slower pace of fertility and smaller completed families. Declines are greater for urban women at higher parities, but the pattern is very much the same regardless of residence or parity.

It is important to underline the implications of this change. In the first place, the slower pace of fertility is not confined to women at high parities as is usually expected. For high parities, it is likely that such lengthening of the intervals reflect an increasing intention to curtail fertility altogether. The reproductive behavior of women at low parities (1–2 children) still may reflect some effort to postpone births until later times. If this is so, aggregate period measures may show a slowdown in the decline, a stabilization, or even a rebound in fertility levels when women have the births that were postponed.

Another interesting aspect is that the decline in fertility, as observed in the slower pace of family

Graph 4.

Proportion of women giving birth within 60 months since marriage or previous child.



building, began more or less *simultaneously* in urban and rural areas, with women in the countryside mimicking the reproductive behavior of their urban counterparts. This is contrary to the customary diffusion expectation (Carlsson, 1966–67), where the rural population repeats the urban experience with a difference only in the starting date.

It has been said that motivation exists for fertility reduction in developing countries –as seen in the number of women who desire fewer children than they already have– and that what is necessary is to provide these societies with the means of fertility control to realize the reproductive goals. Nevertheless, the results obtained here show again that the fertility transition can begin in absence of an institutionally organized family planning program. In fact, 1969 was its first full year of operation in Costa Rica, and by then the decline was already well underway. In other words, "... program(s) followed, rather than lead, rapid expansion of practices aimed at limiting fertility (Demeny, 1979)".

3.2 Differentials in Parity Transitions.

The foregoing analysis is highly aggregated and traces only global trends in the pace of fertility. Although it is possible to make the same computations for each category of relevant variables, such as education or age at marriage, to study differences in the pace of family building among different social strata, it is cumbersome to consider more than one classificatory variable simultaneously in this way.

For these reasons, a model is useful to simplify the analysis of the effects of background variables on the pace of fertility. It should be said however that there are no specific hypotheses about the magnitude and significance of the parameter estimates and that the model is rather oriented to provide a parsimonious description of birthspacing practices and to facilitate some comparisons of interest.

The number of births ocurring to a group of women is the product of a given rate by the length of exposure. In a life table perspective, the number of children born to a cohort of women of characteristics "jk...' during the i^{th} interval is $B_{ijk...} = r_{ijk...}L_{ijk...}$. If the rate can be expressed as $r_{ij...} = \exp(\alpha_0+\alpha_{1_i}+\alpha_{2_j}...)$, then $B_{ij...} = \exp(\alpha_0+\alpha_{1_i}+\alpha_{2_j}...)L_{ij...}$. This transforms into $\ln B_{ij...} = (\alpha_0+\alpha_{1_i}+\alpha_{2_j}...)+\ln L_{ij...}$, which follows the form of a log–linear model with $\ln L_{ij...}$ as offset. For example, if "j" the category associated with education, the model $\ln B_{ij} = (\alpha_0+\alpha_{1_i}+\alpha_{2_j}...)+\ln L_{ij}$. postulates that the effect of education on the chances of having another birth are constant regardless of how long ago the previous child was born.

Sometimes the relative risk is an index useful in summarizing the effects of a particular variable. For example, in the model of independence the expression $\frac{\exp(\alpha_0+\alpha_{1_i}+\alpha_{2_2})}{\exp(\alpha_0+\alpha_{1_i}+\alpha_{2_1})} = \exp(\alpha_{2_2} - \alpha_{2_1})$ measures the relative risk of having another birth among those in the second category of schooling in comparison with those in the first. Note that the model does not involve interactions and the term α_{1_i} cancels out. In other words, the effect of education on the relative odds of having another child does not depend on how long ago the actual parity was reached.

The model described has been used by Holford (1980), Laird and Olivier (1981) and Brestlow (1983) among others. More recently it has received more systematic treatment in the paper by Larson (1984). The approach is equivalent to the use of proportional hazard models in particular cases on the basis of the isomorphism between the likelihood functions of a piecewise exponential and a poisson process.

The methodology makes use of what are called d_x and L_x in the jargon of life table construction. In the present context, births substitute for deaths and the L function refers to the time spent in a particular interval at a given parity state.

By analogy with the life table, the span of attrition of a parity cohort of women by the birth of another child is divided in parts. The number of intervals to be constructed is largely arbitrary, with too many complicating the analysis and too few perhaps not giving enough detail. Along with this is the problem of definition of the cutpoints delimiting the intervals. In the present work, 18 and 30 months since the previous birth were considered appropriate delimiting values that would capture the main features of the data.

Taking into account the results presented in the first part of the paper, three birth cohorts were defined for each parity. The first covers the pre–decline years 1955-63. The second spans 1964-68 and represents behavior during the early phase of fertility decline, while 1969–74 is associated with the late stage, beyond which period fertility was leveling off. It should be noted that for this part of the paper the interval between marriage and first birth is not considered.

Table 1.

Initial size of the births cohorts analyzed and proportions without another birth after 18 and 30 months since the previous child, by parity.

PARITY	COHORTS					
	1955–63		1964–68		1969–	
	URBAN	RURAL	URBAN	RURAL	URBAN	RURAL
1–2	739	781	464	477	805	798
18 months	.65	.55	.69	.58	.82	.74
30 months	.36	.21	.42	.23	.60	.46
3–4	246*	337*	316	428	358	495
18 months	.75	.66	.79	.67	.89	.79
30 months	.44	.25	.59	.32	.73	.51
5 and up			382	866	278	793
18 months			.74	.70	.85	.81
30 months			.46	.34	.67	.51

* These cohorts refer to the period 1960–63 only.

Several social and biological factors should be considered in the study of birthspacing, for example, contraceptive use, fecundability, coital frequency, etc. Ideally, it would be desirable to have data about the levels of such variables for each birth interval, but doubts about their reliability, and interest in levels of current fertility may explain why such information is rarely obtained in cross-sectional investigations. The WFS survey used in this study, has some measurements of these kind but they refer to the last and next to last birth intervals. Given selectivity processes in parity transitions, data on current practice or about the next to last interval cannot be used for the analysis of previous parities.

These conditions limit the analysis to a few background factors that not only may be imperfect proxies for the variables aforementioned, but also ignore altogether the intervening effects of the intermediate variables. In the concrete case, the variables considered are education, ideal family size, marriage duration, age of the woman when the previous parity was reached and type of marital union.

The influence of education, measured in years of schooling (SCH), on fertility has been found in very different contexts. In first place, increasing schooling conflicts in some degree with an early age at marriage, and at the same time it may increase awareness and expectations of alternatives to early motherhood. Particularly important is the idea that education can also increase knowledge,

attitudes, and ultimately practice of contraception (Cochrane, 1979). In the present case, years of schooling has been grouped as follows: 3 years or less, 4–6 years, and 7 (secondary) or more.

If education increases the awareness that reproduction can be controlled, the implicit idea of setting a reproductive target may also surface. Thus, it seems reasonable to include in the model the variable desired family size (DFS) with the expectation that couples would approach their reproductive target quickly, and change the pace thereafter. It should be noted however that the value of this index as a predictor of fertility is debatable. It is even more controversial in the context of family building because the value used refers to the time of the survey; if couples adjust their reproductive targets over time, or if the value declared only rationalizes actual fertility, such a measure may reflect a spurious association. Furthermore, there may not be a single reproductive target. Thus, with a good deal of caution, desired family size is included with three categories: 0–2, 3–4 and 5 children or more.

Duration of marriage (DUR) up to the birth of the last child and the kind of marital union are included to describe the characteristics surrounding a birth interval. For low durations much of the fertility is yet to be realized and a more rapid pace of family building could be expected. By contrast, long spans of exposure mean that desired family sizes have been more or less satisfied and long waiting times are expected. However, with more control over reproduction such a relationship may diminish over time. Duration of union has the following categories: 0–4, 5–9, 10–14, and 15 and more years of marriage.

Along with duration, the type of marital union (MARR: legal, consensual) is also considered, in the expectation that formal unions are be associated with a shorter family building process.

The last covariate considered is age (AGE) of women at last parity. "Age has long been recognized as an important determinant of fertility.... Age is found to be strongly associated with proportional changes in the birth rate at all interval durations, for all birth orders, all educational groups and all time periods. ... [a]ge is indeed acting to capture biological variation over the life course of individual women...." (Hobcraft, 1985). Although no attempts to control for other factors were made, more specific information about age and pace of fertility comes from the paper by Rindfuss, et al., (1982). Here only weak links, or no relation at all, were found between age at first birth and the length of successive intervals in the Korean context. Rather than studying only the effect of age at initiation of motherhood on the pace of fertility, the age when a particular parity was reached was considered as an indication of the relative position of the woman within the reproductive and life cycle. The range of this variable is divided into the following categories: 18 years or less, 19–25, and 26 or more. It should be noted that age at last parity is equal to age at first union plus duration

of union, and therefore in some degree age at marriage is implicit in the model.

Finally it should be recalled at this point that spacing (S) is the response variable, with three categories, namely $\leq$ 18, 19–30, and 31 months and more.

For a given parity, there are several hypotheses of interest. The most basic null hypothesis is one that proposes a simple model to describe the dynamic of birthspacing without regard for period effects. If this model is inadequate, then an interaction term should be added accounting for period, geographical area, or both to improve the fit. If this alternative is also rejected, the subsequent question is whether or not it is possible to find a model that fits adequately.

Thus, the first effort was oriented to find a model that could be used as a standard for comparison. With this objective, alternative forms were fitted for data about women in urban areas at parities 1–2 for the pre–decline period (1955–63). It should be noted that this was exploratory work intended only to locate a baseline model on the basis of statistical fit. Following the convention of denoting a hierarchical model by the higher interactions involved, with a generalized chi–square statistic, G^2, of 208 and 178 degrees of freedom the model $S*(DFS+SCH*AGE+MARR)$ provides an adequate fit to the data. It should be noted that this model does not include a term for duration of union, which did not significantly improve the fit. Apart of interactions between spacing and predictors reflecting substantive association, it incorporates a second degree interaction term reflecting an additional effect due to the interaction of schooling and age at last parity on the pace of fertility.

The next step was to test the naive hypothesis that the baseline model describes all 1–2 parity cohorts well. However, a statistic of $G^2 = 1317$, with 996 degrees of freedom gives no support at all to this hypothesis.

Trying to improve the fit, the model is modified by introducing an interaction component taking account of period, as well as an additional term allowing for differences between zones. However, a $G^2 = 953$ with 816 df. is too large to consider the model as appropriate. These results mean that the change in birthspacing cannot simply be described as a change in the values of the parameters over time and over the urban–rural dimension, but that there was a change in the way in which the background variables affect the pace of fertility.

An examination of the components of the deviance shows that a poor fit is obtained in the rural areas in the predecline 1955–63 and early decline 1964–68 periods. Table 2 presents the results of some other models intended to better describe these periods.

Table 2.

Models fitted to the data, by parity, period and zone.

Parity	Zone	Period	Model	G^2	D.F.	Probability*.
1–2	Urban	1955–63	S*(DFS+SCH*AGE+MARR)	208	178	.119
		1964–68	S*(DFS+SCH*AGE+MARR)	151	122	.072
		1969–	S*(DFS+SCH*AGE+MARR)	176	171	.772
	Rural	1955–63	S*(DFS*AGE+DFS*MARR)	125	110	.310
		1964–68	S*(DFS+SCH*AGE+MARR)	111	91	.139
		1969–	S*(DFS+SCH*AGE+MARR)	148	144	.771
3–4	Urban	1960–63	S*(DFS+AGE)	198	158	.032
		1964–68	S*(AGE+DFS+SCH)	248	188	.004
		1969–	S*(DFS+SCH*AGE+MARR)	186	185	.944
	Rural	1960–63	S*(AGE*SCH*DFS)	158	108	.002
		1964–68	S*(DFS*AGE)	194	151	.019
		1969–	S*(DFS+SCH*AGE+MARR)	197	163	.069
5–+	Urban	1964–68	S*(SCH)	200	144	.002
		1969–	S*(DFS+SCH*AGE+MARR)	142	124	.240
	Rural	1964–68	S*(DUR*AGE)	165	136	.087
		1969–	S*(DFS+SCH*AGE+MARR)	183	160	.215

* This is the probability of observing a larger value than the one already obtained

Similar procedures were followed for the other parity groups. For women who already have 3 or 4 children the same baseline model was used in the whole data set. This gives a generalized chi–square statistic of 1481, with 1094 degrees of freedom that does not support the hypothesis that the model is the same for the whole parity group. Although the inclusion of a term allowing for urban–rural, as well as period interaction is very significant, the model with a $G^2 = 1181$ and 936 degrees of freedom still fits very poorly. The model is particularly inadequate both in urban and rural areas in the pre–and early decline stages.

The baseline model applied to all women at parity 5 or more gives a value of $G^2 = 854$ that with 618 degrees of freedom evidences a poor fit. A decrease in the deviance of 99 and in the degrees of freedom by 27 indicates that the inclusion of a period interaction term is highly significant. An additional improvement is obtained with an interaction accounting for geographical area, but still this model with $G^2 = 667$ and 539 degrees of freedom does not seem satisfactory. The poor fit of the baseline model in this case originates in both the urban and rural areas in the 1964–68 period.

Overall, the results obtained give clear evidence of change toward some degree of convergence in

the association between birthspacing and the background variables.

For lower parities it seems that the structure of the relations between the tempo of fertility and the background variables is constant over the transition from earlier to later periods, although the magnitude of their influences varies and typically weakens during the initial stage of change in the years 1964–68. It should be noted that for the rural areas in the 1955–63 period the model is different it does not include schooling.

The mid–range parities 3–4 present a less regular pattern. Basically, some of the background variables seem to be significant for the pre–transitional and early stage of decline but as a whole, the models listed for those periods are inadequate.

Finally, for women with 5 or more children in urban areas, it is not possible to find an adequate structure during the transitional stage. In the rural context, duration of the union and age at marriage improve the model somewhat.

Altogether, the present analysis shows that for parities 3 and higher, the set of background variables is not sufficient to discriminate between those women who have another child rapidly and those who wait longer.

In spite of very limited success in finding adequate models that describe the transition, the similarity of the models for the late 1969– period allows some relevant contrasts to show how the background variables affect the pace of fertility. These are expressed in terms of relative risks, or the ratio of the hazard functions, which are computed by exponentiating the difference of the estimated effects. Not all desirable comparisons are shown in the table. Some are missing because the data does not allow them, i.e., they involve aliased effects. Some other contrasts are omitted because based on estimates with very high variances, they give wild values.

The results obtained are produced in table 3. It should be noted that the series are presented by parity, although caution should be taken since no testing was made of the models across parities. The first entry in the table, 1.46, means that having all other variables the same value, women at parity 1–2 in urban areas who wanted 3–4 children were 46% more likely to have the next child within the first 18 months since the previous birth than women who had already reached their desired family size.

Women at parities 1–2 but desiring larger families show a consistent likelihood of a faster advance to the next parity, with a rate directly related to the magnitude of the additional number of children

wanted. Interestingly, the slope is more pronounced in urban than in rural areas. A similar trend can be observed for women at parities 3–4.

Table 3.

Relative risk of having another birth* within a given time since the previous child.
Urban and rural areas in the late period of fertility decline.

		URBAN			RURAL		
Variable	Segment	1–2	3–4	5–+	1–2	3–4	5–+
DFS (3–4)	0–18 months	1.46	.84	.58	.97	.51	1.06
	19–30 months	1.51	.38	1.32	1.19	.45	1.62
	31–+ months	2.67	.52	.43	1.68	.82	1.02
DFS (5 +)	0–18 months	2.51	1.17	.47	1.49	1.12	1.09
	19–30 months	2.71	1.06	1.42	1.80	.80	1.19
	31–+ months	3.50	1.12	.86	2.69	1.97	1.00
MARR (Cons)	0–18 months	1.89	1.33	2.03	.85	1.36	1.15
	19–30 months	1.76	1.10	0.81	0.98	1.24	1.28
	31–+ months	.66	.73	0.75	1.71	2.42	1.80
With Age 19–25							
SCH (4–6)	0–18 months	1.74	.74	.50	.62	1.24	.93
	19–30 months	.63	#	.66	1.19	.34	.86
	31–+ months	.71	.67	1.11	1.11	.26	1.58
SCH (7 +)	0–18 months	1.42	.35	#	.54	#	#
	19–30 months	.87	2.23	#	.87	#	#
	31–+ months	.84	1.77	1.56	.93	#	#
With Age $\geq$ 26							
SCH (4–6)	0–18 months	2.76	.71	**	.79	.86	**
	19–30 months	.48	#	**	.16	.77	**
	31–+ months	.26	.87	**	.10	**	**
SCH (7 +)	0–18 months	1.89	**	**	.89	**	**
	19–30 months	.40	**	**	1.12	#	**
	31–+ months	.41	**	**	#	**	#
With Sch 4–6							
AGE (19–25)	0–18 months	.72	.42	1.04	.72	1.28	1.08
	19–30 months	.40	#	1.39	.97	.09	1.22
	31–+ months	.18	#	2.22	1.27	.01	2.10
AGE (26 +)	0–18 months	.85	.13	**	1.01	1.15	**
	19–30 months	.21	#	**	.25	.14	**
	31–+ months	.08	#	**	.74	.02	**
With Sch $\geq$ 7							
AGE (19–25)	0–18 months	.66	.31	#	.93	#	#
	19–30 months	.48	#	#	1.50	#	#
	31–+ months	.07	#	**	.12	**	**
AGE (26 +)	0–18 months	.65	**	**	1.67	**	**
	19–30 months	.15	#	**	3.70	**	**
	31–+ months	.27	#	**	#	**	**

* The reference value for the ratio is the first category of a given dimension. ** Non estimable. # Outlier.

For women who actually have as many children as they want, those at parities 3–4 expectedly show a decreased likelihood of having another child, both in urban and rural areas. However, women at parities 5 and up in rural areas are as likely to have their next birth as those for whom the desired family size is only 1–2 children. This again may reflect the greater selectivity in fecundity and/or fertility control practices of those who already have large families.

In urban areas the relative risk of another birth is larger for consensual arrangements in the first months elapsed since the previous birth, but tend to decline as time passes, so that beyond 30 months women in legal unions are more likely to have another child. In rural areas, women in formal unions at parities 1–2 behave in the opposite way, with marriages more likely than consensual unions to lead to another birth. However, for parities 3 and up the relative risk of another birth is higher for consensual unions and with the time elapsed since the previous child.

Although in general education lowers the chances of another birth within a given time span, it is hard to identify a definite pattern among the figures shown.

In a similar way, the effect of age at previous birth does vary at each level of schooling, but at each level the relative risk of another child is lower for ages 19 and up than for women who reached the previous parity before age 18. This effect is very consistent in urban areas at parities 1–2, but not identifiable in the rural context.

4 Final comments.

This paper has reviewed, from the perspective of birthspacing, the fertility transition among the Costa Rican population as recently as can be documented with available data.

The contribution of older surveys, those from 1963 and 1969, show that the patterns were fairly constant before the early sixties.

Measured in terms of births after 24 months, women in urban areas show two distinguishable patterns. First, behavior between marriage and first birth has changed very little, if any, and the pace with which couples have their first birth is very rapid. Second, considering either the 20 or 60 months span, a slowdown in the pace of family building is clearly visible for women with one or more children. Given that for parities three and up the pace is fairly similar, it may be an indication that motivation for family limitation does not increase with family size. Put in another way, the dis-utility of an additional child does not balance the cost of increased vigilance against

additional pregnancies. Another explanation could be that couples engage, after the second child, in a kind coital pattern that only slowly changes as a result of biological factors. The fairly low fertility in urban areas may suggest that a good proportion of the births at parities 3 and up may be unwanted.

The results of rural areas show more differentiation. Again, there has been little indication of change between marriage and first birth, and women at parities 1–2 apparently behave differently from those at 3–4 and these from those who already have 5 or more children. The differential can be observed more clearly with the trends over the 60 month span since the previous birth.

Equally important is that the change in family building practices is, with the exception of the interval between marriage and first birth, evidenced almost simultaneously across parities and geographical zones. Clearly, most of the couples are contributing to the decline, and this is not limited to women with already large families. Whether or not the simultaneity observed can be traced to the same cause is a question that deserves more study.

An investigation of factors associated with the pace of fertility shows that for parities 1–2, ideal family size, the type of marriage, schooling, and age at which the parity was reached are significantly associated. This exists both in urban in the pre–decline as well as in the early and late stages of of fertility transition, though the effect of such background factors varies over time. Although the same model cannot be selected for other parities, it is important to point out that there is an apparent convergence, such that in the 1969 period the model is the same for all parities both in urban and rural zones. In other words the increasing similarity in the trends is accompanied by an increasing similarity in associated factors.

A final comment is in order with respect to the hypothesis raised in the introduction of the paper. Women at low parities have, during the transitional stage, modified their reproductive practices to join couples with larger family sizes in their goals of limiting births. This paper has demonstrated that this has been the case. However, the study has not been able to support the second part of the thesis, that since the mid-seventies women at low parities have increased their pace of reproduction in a way that might explain the plateau in period fertility rates. This has to wait for more recent data.

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