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Relative Impact of 'Starting, Spacing and Stopping Fertility Behaviour' in Sri Lanka

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Introduction

It has been observed that in the 1960s, the Ig (index of marital fertility) in Sri Lanka for the first time, fell at least ten per cent below the plateau level of the pre-1960 decades [1]. By the 1960s, the first generation with mass schooling and the last generation of parents without mass schooling were in the first half and the second half of their childbearing period, respectively. This recognizes the fact that both these generations contributed to the first fall of ten percent in the Ig during the 1960s. Relating the generations who contributed to the onset of Sri Lanka's fertility transition to the introduction of the mass education programme seems relevant since Sri Lanka's educational system was heavily influenced by the British educational system and the commencement of mass education occurred just 15 years prior to the onset of the fertility transition.

Caldwell [2] showed that there are mechanisms that can directly relate schooling to the onset of fertility transition. He argued that these mechanisms were not identical in the contemporary developing world and in the nineteenth century European society. Al-though the evidence is scattered, he attempted to show that there was a substantial Westernizing influence in developing world schooling and suggested that this was a potent force for change in the area of family relations. However, the present paper does not attempt to test Caldwell's thesis in the context of the Sri Lankan fertility transition but adopts it as its theoretical underpinning in order to define the generations who contributed to the onset of the fertility transition. The main objective of the present paper is to examine the relative impact of the 'starting, spacing, and stopping' childbearing in order to find out which component is more important for fertility reduction in the first generation who were covered by the mass schooling programme as compared to the last generation of parents who were not exposed to it (i.e. at the initial stage of the fertility transition). The present analysis expects the identification of such a component to provide a better understanding of the mechanisms underlying the Sri Lankan fertility transition.

Most of the historical research focussing on the transition from natural to controlled fertility suggests that the fertility transition can be indexed by a declining age at last, birth [3] [4] [5] [6] [7] [8]. Although the concept of family limitation has been defined in terms of a strategy of limiting births by stopping childbearing (fertility), a logical alternative strategy could be that of limiting births by deliberately prolonging the space between births and delaying the initiation of childbearing following marriage [9]. Therefore, a more complete understanding of the behavioural changes underlying fertility transition definitely calls for an assessment of the part played by the age at which reproductive behaviour begins, birth spacing, and the age at which childbearing is terminated.

Data and its quality

This analysis is based on data from three sample surveys: the Sri Lanka Fertility Survey (SLFS), 1975, the Sri Lanka Demographic and Health Survey (SLDHS), 1987, and the Sri Lanka Demographic Change project (SLDCP), 1985. The Sri Lanka Fertility Survey was one of the World Fertility Surveys carried out under the auspices of the International Statistical Institute in cooperation with the United Nations and the International Union for the Scientific Study of Population. The fieldwork was conducted by the Department of Census and Statistics, Sri Lanka. In 1975, the SLFS observed the last generation of parents 'without mass schooling' and the first generation 'with mass schooling' in the age groups of 35-49 years (i.e. the 1925-39 birth cohort) and 20-34 years (i.e. the 1940-54 birth cohort) respectively. The fieldwork for the SLFS began in August 1975 and was completed in October 1975.

The SLFS covered a nationally representative probability sample of 7,112 eligible women. A total of 6,812 ever-married women were interviewed from the sample by trained female interviewers under very thorough supervision, giving a response rate of 95,8 percent. The criteria for selecting eligible women for the detailed interviews were that they should be between 12 and 49 years of age, ever-married and should have spent the previous night in the household. The overall quality of the SLFS data has been assessed and ranked as being 'acceptable' by the United Nations [10].

The Sri Lanka Demographic and Health Survey was carried out by the Department of Census and Statistics, Sri Lanka with the assistance of the Institute of Resource Development, a subsidiary of the Westinghouse Electric Co-operation, Maryland, U.S.A. This survey is part of the worldwide Demographic and Health Surveys (DHS) programme which was designed to collect data on fertility, family planning, maternal and child health. In 1987, the SLDHS observed the first generation 'with mass schooling' in the age group 32-47 years

(i.e. the 1940-54 birth cohort). The SLDHS planned to conduct interviews in all zones in the country, but civil disturbances in Zone 8 (Eastern coastal belt) and Zone 9 (Northern province) prevented the interviews from being conducted in these areas which contained approximately 1.4 percent of the estimated population in 1986.

The interviewers for the survey were drawn from among the Statistical Investigators of the Department of Census and Statistics. Data collection for the survey commenced in January 1987 and was completed in April 1987. This survey defined an eligible respondent as a woman between 15-49 years of age who was currently married, divorced, separated, or widowed, and who had spent the previous night in the household. From a total of 8,119 households listed in seven zones, 6,170 eligible respondents were identified and the interviews of 5,865 women were completed (giving a response rate of 95.1 percent)[11]. Under-reporting of demographic events in the SLDHS appears to be minor.[11] By assessing the overall quality of birth history data, Arnold [12] concluded that the Demographic and Health Survey (DHS) data are reasonably complete and accurate in all 22 DHS countries. According to these assessments, SLDHS data do not reveal any gross errors that would seriously bias demographic estimates.

The Sri Lanka Demographic Change a collaborative project between the Department of Demography, the Australian National University and the Demographic Training and Research Unit, University of Colombo. The present paper utilised one of the seven localities namely, Bondupitiya village, situated in the Southwest lowland area, surveyed by the SLDCP in 1985. This research project collected both quantitative data and more detailed micro-level information from 406 and 476 ever married males and females respectively in Bondupitiya village. The research team consisted of 15 persons, mainly female, with university training in the social sciences and who had undergone specific training both before and during the fieldwork. The principal investigators spent the entire study period in the field and closely supervised the field interviewers. All information collected was checked and collated as the project continued, and the households were subjected to repeated visits. Therefore, the information can be regarded as being highly reliable.

Results and Discussion

As mentioned earlier, persons who were born prior to the introduction of the mass schooling programme in 1945 were defined as the last generation of parents 'without mass schooling'. They experienced the effect of education only as parents. A majority of persons from this group were couples with no education and/or little education. However, it appears that the women in this generation were at least partly responsible for the onset of the fertility transition as all of

them were above 20 year of age, it is reasonable to expect that at least a substantial minority of these women started to control their marital fertility even before 1960 since it is difficult to accept that they began to do so around the same time that marital fertility rates first recorded a decline in the country.[1]

Persons who were born during the period 1940-54 have been defined as the first generation 'with mass schooling'. A majority of these persons were able to enter the formal school sector when mass education was introduced, but before the onset of the fertility transition. When the growth in school enrolment rates from 1901 to 1960 is examined, the selection of this cohort as the first generation 'with mass schooling' seems to be valid because there was a 32.4 percent illcrease (i.e. from 52.1 in 1945 to 84.5 in 1960) in the school enrolment rate during the 15 year period 1945-1960 as compared to only at 27.9 percent increase (i.e. from 25.2 in 1901 to 52.1 in 1945) in the enrolment rate during the entire 44-year period from 1901-1945.

The McDonald equation, which shows the average, completed fertility of a group of ever-married women as a function of their starting, spacing and stopping fertility was used for the analysis. Although there are two other modified versions of the same equation,[9] [10] [11] [12] the original equation presented in 1984 was used because it considers age at first marriage and the interval between marriage and first birth, both of which are important factors in the case of Sri Lanka.[1]

It is essential to note that problems of measurement are severe for the mean age at last birth since the SLFS and SLDHS inter-viewed only women below 50 years of age In this case, one can expect that a certain proportion will not have completed their fertility by the time of the survey. Although the analysis can be confined to women aged 45-49 years at the time of the survey to minimize the under-estimation of age at last birth, the present analysis extends it to women aged of respondents. Since currently pregnant women aged 40-49 years comprised only 0.9 percent and 0.6 percent respectively of the SLFS and SLDHS samples, the women in these samples do not show a high incidence of intention to have a birth after 40 years of age. The average age at last birth for the SLFS and SLDHS samples was also below 35 with standard deviations of 5.6 and 5.0 respectively. Therefore, under-estimation of age at last birth by analyzing the 40-49 age group would be minimal.

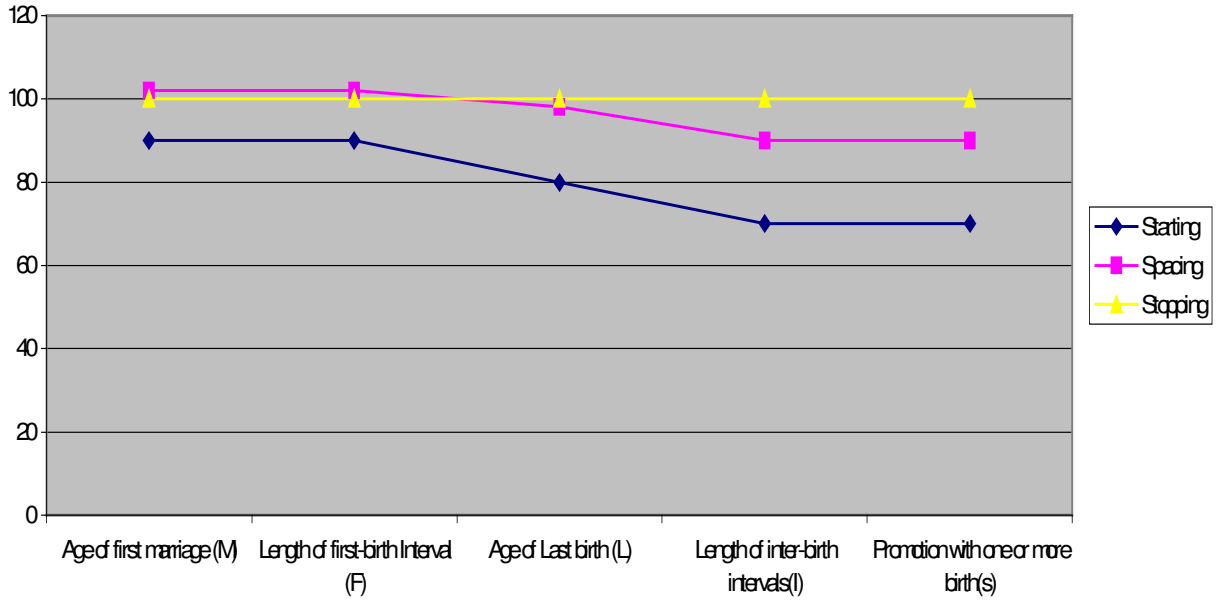
A method of step-wise standardization was used to illustrate the extent of non-dependence of starting, spacing and stopping childbearing. Since McDonald's analysis of the situation in 34 countries using World Fertility Survey data provided reliable results, the same order with which he introduced the parameters into the stepwise standardization was used in the present analysis.

Thus the 'standard' which McDonald used by combining the median values of M (age at first marriage), F (length of first birth interval), L (age at last birth), I (length of inter-birth intervals), and S (proportion with one or more births) for 34 countries was employed here.

The relative impact of 'fertility starting, spacing and stopping as well as of childlessness' patterns is shown in Figure 1 for the last generation of parents 'without mass schooling' and the first generation 'with mass schooling'.

Figure 1 shows that the contribution of both age at marriage and age it first birth

Fig 1: Relative impact of starting, spacing and stopping childbearing and of childlessness among the parent generation 'without mass schooling' and the first generation 'with mass schooling'



90	102	100 Age of first marriage (M)
90	102	100 Length of first-birth Interval (F)
80	98	100 Age of Last birth (L)
70	90	100 Length of inter-birth intervals(I)
70	90	100 Promotion with one or more birth(s)

to the higher fertility of the former generations of parents was greater than that of the other components studied (as the values are higher than the standard used.). The slope between F (i.e. the mean age at first birth) and also L and I (i.e. the mean length of inter-birth intervals) are not very different from each other indicating that both the decline in age at last birth and longer spacing intervals were primarily responsible for the fertility reduction in the last generation of parents 'without mass schooling'. The relatively high horizontal line between I and S (i.e. the proportion of the selected group of women who have at least one child) indicates that childlessness did not have a significant impact on fertility.

All the five components were observed to contribute to the reduction of fertility among the first generation of parents 'with mass schooling'. As shown in Figure 1 where all of them have values below that of the standard. However, the pattern was similar to that of the last generation of parent's without mass schooling', the only difference being the steeper slope between F and L which indicated that the contribution of the decline in age at last birth to fertility reduction was greater than that of the other components. In other words, 'fertility stopping' behaviour was the major cause of fertility decline in the first generation 'with mass schooling'. The increased importance of the desire to stop childbearing among this first generation which was exposed to mass schooling was also evident in Bondupitiya village where the women were asked directly why they started to control their fertility (Table 1).

TABLE 1 Percentage distribution of women by reason for starting fertility control and by generation, Bondupitiya village (N=153)

Reason	**Parent generation**	**First generation**
To space childbearing	20.4	15.6
To stop childbearing	52.3	70.6
Involuntary control	18.3	9.2
No response	9.1	4.6

- 1910-39 birth cohort; * * 1940-54 birth cohort

- Source: Derived from the SLDCP, 1985.

The McDonald equation can also be transformed to find the proportion of change effected by changes in the educational composition of the first generation `with mass schooling' and in the 'starting, spacing and stopping' patterns of child-bearing among the educational categories in this generation in relation to the last generation of parents who were 'without mass schooling'. Although McDonald indicated that his equation could be use to assess the effect of an explanatory

variable upon changes in completed fertility, this possibility has so far not been studied in the demographic literature. It was possible to pursue this direction in the present study since it traces two cohorts with completed fertility derived from the SLFS an SLDHS respectively. Table 2 presents the findings of this analysis. An analysis of the impact of education on fertility decline observed among the first generation' with mass schooling', showed that 25.5 percent of the fertility change was due to changes in the educational composition of the population. This suggests that the higher proportion of better-educated persons in the first generation 'with mass schooling' had a significant impact on the decline in fertility.

Table2 also shows that the decline in the interval between age at marriage and age at first birth in the first generation 'with mass schooling' delayed the effect of 'fertility-starting' behaviour on fertility decline although there was a significant increase in the age at marriage in that generation as compared to the last generation 'without mass schooling'. In fact, the effect of 'fertility-starting' behaviour on fertility decline was mainly due to the postponement of marriage among the first generation 'with mass schooling'.

TABLE 2 Decomposition of completed fertility by changes in educational composition and patterns of starting, spacing and stopping childbearing and childlessness in the first generation* relative to the parent generation**

	Percentage due to	**% when change in completed fertility (i.e. -22.3) = 100**
Change in completed fertility	-22.3	100.0
Due to educational composition	-5.7	-25.5
Due to change in childlessness	+0.8	+3.6
Due to change in age at last birth	-9.2	-41.2
Due to change in age at marriage	-6.5	-29.1
Due to change in length of interval between marriage and first birth	+1.6	+7.2
Due to change in inter-birth intervals	-3.3	-14.8

* First generation 'with mass schooling' or 1940-47 birth cohort.

** Last generation of parents 'without mass schooling' or 1925-35 birth cohort.

Source: Derived from the SLFS, 1975 and SLDHS, 1987.

Childlessness was not an important factor in the fertility decline in Sri Lanka. According to SLFS and SLDHS data, the proportion of childlessness was less than four percent in both generations. The decline it childlessness with successive generation also suggests that childlessness was not practised voluntarily in Sri Lanka in order to reduce fertility.

The main contributory factor for the decline in fertility was the decline in the age at last birth in the first generation 'with mass schooling'. It can be observed that about 41 percent of the change in completed fertility was the result of the decline in age at last birth. It is evident from Table2 that about 15 percent of the change in completed fertility was due to spacing (i.e. changes in the mean inter-birth intervals). Increased spacing behaviour also therefore, has contributed significantly to the change in completed fertility.

Conclusion

The present analysis is a contribution to the ongoing debate between the 'birth stopping' and 'birth spacing'approaches to fertility transition. In the case of Sri Lanka, the transition from natural to controlled fertility was not only dependent on the truncation of childbearing, although that was a major component associated, with fertility decline, but also upon the initiation of childbearing and birth spacing behaviour. Therefore, family size changes involved strategies related to decision making throughout the reproductive time span. In other words, this suggests that couples were using contraception at the beginning of childbearing, at the subsequent birth intervals, and at the last birth interval. These findings have wide applicability for other developing countries attempting to develop appropriate policies and for understanding the process of fertility transition. They can aim their national family planning programmes at all the married fecund women irrespective of their age and the number of children ever born.

The present study also finds that the changes in the proportion of better-educated women contributed significantly to the change in fertility of the first generation of parents 'with mass schooling' as compared to the last generation of parents 'without mass schooling'. It also observed that the decline in age at last birth contributed most, but age at marriage and birth spacing patterns were also significant, in explaining changes in completed fertility within the educational sub-groups. This clearly suggests that the improvement of female education has a substantial effect on the commencement of the onset of fertility transition even

in the absence of a strongly organized national family planning programme as in the case of Sri Lanka during the decade of the 1960s. One can claim that advancement of women's education and subsequent wage employment increased their status within the family and within the society. Family planning decisions can be regarded, as most rational and conscious decisions, which become a joint responsibility of both husband and wife when both spouse, are educated. I his provides the possibility for them to plan their family size intentionally and choose the most suitable means to achieve that rationally perceived goal.

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