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TRANSITION FROM TRADITIONAL HIGH TO MODERN LOW FERTILITY: CANADIAN ABORIGINALS

A. Romaniuc
Statistics Canada, Ottawa, Ontario, Canada

Résumé – La population autochtone du Canada est en pleine transition démographique. Leur fécondité a connu une baisse rapide au cours des deux dernières décennies, les autochtones ayant eu recours à diverses stratégies pour maîtriser leur procréation. Ils ont limité les naissances en fonction du rang de l'enfant (taille de la famille), retardé la venue du premier enfant et espacé les naissances. La première stratégie a été dominante surtout au début de la transition démographique; les deux dernières l'ont suivi avec un certain retard. Ainsi, aux considérations d'intensité se sont ajoutées celles de calendrier des naissances.

Abstract – The aboriginal people of Canada are in the midst of a rapid fertility transition. To control their fertility they resorted to such strategies as: parity – dependent limitations of births, later starting and wider spacing of childbearing. The first was dominant at the earlier stage of their demographic transition; the latter two came into play somewhat later. Thus the grounds for birth control have been progressively broadened to accommodate considerations of both family size and timing of childbearing.

Key Words – **Canadian aboriginals, fertility, demographic transition**

Introduction

The aboriginal people of Canada, about half a million strong (see Table 1), retained their traditional high fertility long after the country had embarked on a secular decline of fertility. For a long time, they continued to display demographic features more closely resembling those of developing countries than those of modern society. This is now changing. Canadian aboriginals are in the midst of a rapid fertility transition. The mid-1960s witnessed an abrubt downturn in the birth rate: from 47 births per 1,000 to about 28 by the late 1970s. Yet, the gap between the birth rates of the aboriginal and the non-aboriginal populations remains wide – 28 against 15 births per 1,000 – probably reflecting economic and social disparities, as evidenced by their differing levels of income, education and quality of housing (Pryor, 1984). Hence, and although well under way, the demographic transition of aboriginal people is far from having run its course.

The fundamental question is this: what are the forces that have triggered and sustained the process of fertility decline? What has occurred in aboriginal society that can account for a downturn in its fertility of the magnitude witnessed since the mid-1960s? This paper is a first instalment of a broader research project designed to elucidate the *modus operandi* of the demographic transition of Canada's aboriginals. It starts with an examination of the trends in birth rates from the beginning of the century, thus placing the current decline into an historical perspective. An attempt is then made to secure some measure of the shift in the age and parity distribution associated with the fertility transition. This is followed by an examination of fertility differentials by rural-urban habitat and educational attainment, as a first step toward a more systematic exploration of the determinants of fertility decline to be undertaken later. It is hoped that this paper, as it stands, will provide some insights into the dynamics of the changes affecting the fertility of Canadian aboriginals, at this juncture of their demographic evolution, and will lay the groundwork for an in-depth investigation of the underlying causes. The paper concludes with a section outlining the research agenda for such an in-depth investigation.

Fertility Trends

The trends in crude birth rates from the beginning of the century are portrayed in Figure 1. One remarkable feature is that the onset of fertility decline has been preceded by what has been referred to by this author in an earlier study as a "cycle of rising fertility associated with modernization" (Romaniuk,

TABLE 1. NATIVE POPULATION BY LEGAL STATUS AND TYPE OF RESIDENCE, CANADA, 1981

Status	Urban	Rural farm	Rural non-farm	Total
Status Indian	92,800	5,945	193,955	292,700
Non-status Indian	50,665	1,170	23,280	75,115
Total Native Indian	143,460	7,115	217,235	367,810
Inuit	5,115	90	20,190	25,395
Métis	58,285	2,875	37,095	98,255
Total Native Pop.	206,860	10,080	274,520	491,460

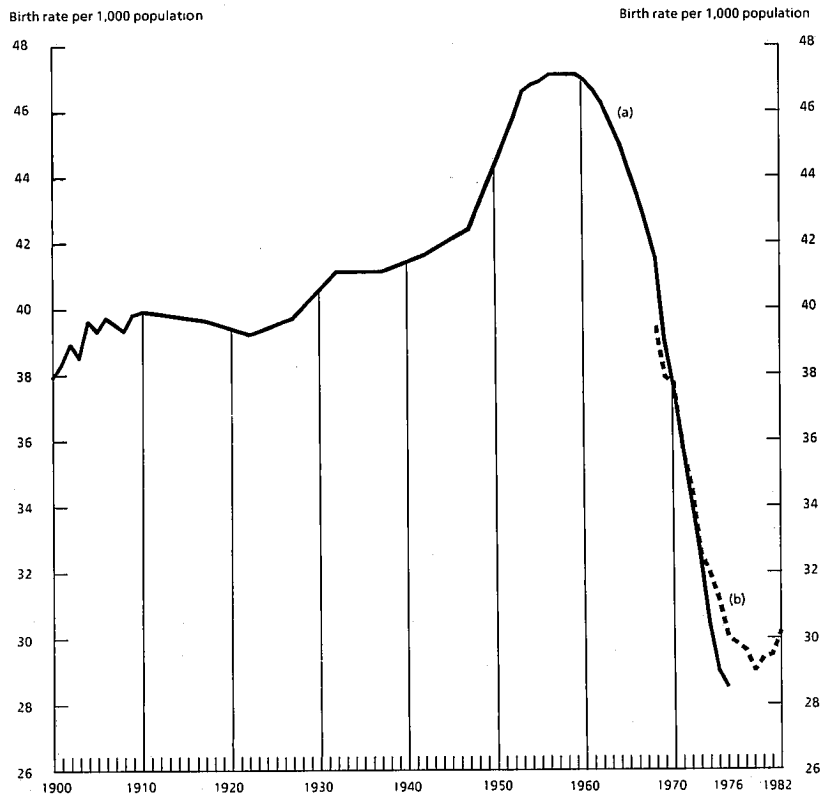
Source: Statistics Canada, 1981 Census of Canada, Special tabulation.

1981). The birth rate rose from about 40 per 1,000 in the pre-World War II period to about 47 per 1,000 by 1960.

This rising cycle in aboriginal fertility is ascribed to a host of factors, all associated with early modernization. Improvement in health conditions meant a better chance of mothers surviving childbirth, and, according to some evidence, a reduction in miscarriages and stillbirths. The government's policy of resettling seminomadic Indians in larger, more stable communities may have further reduced these risks, as Indian women were then able to enjoy more comfortable living and the benefits of modern gynecological services. Also, as the men were no longer compelled to engage in such traditional activities as hunting and trapping, prolonged conjugal separation occurred less frequently. Improvements in nutrition, associated with sedentism, has resulted, according to one study, in earlier menarche and later amenorrhea and consequently a longer reproductive period (Roth, 1981).

Changes in lactation habits were of even greater consequence. In traditional Indian societies, prolonged breast-feeding was customary, and breast-feeding is known to have an inhibiting effect on fecundity. With modernization and the increasing availability of milk and modern infant diet, Indian wom-

FIGURE 1. ESTIMATES OF CRUDE BIRTH RATES FOR CANADIAN INDIANS, 1900-1982



Source: Romaniuk, A. The Current Decline of Fertility Among Canadian Indians. How large is this Decline? Its Causes and Implications. Indian Demographic Workshop: Implications for Policy and Planning. Ottawa, 1980, p. 30.

(a) Status and Non-status Indians.
(b) Status Indians only.

en gave up breast-feeding and resorted to bottle-feeding on a massive scale. While these changes in the determinants of natural fertility took place, birth control was in little evidence among married women. As a result, the pregnancy rate increased and birth intervals decreased (Romaniuk, 1981).

But by the mid-1960s the birth rate took a sharp nosedive, to about 28 births per 1,000 population by the late 1970s. An independent confirmation of the decline is offered by a set of indicators based on the last three decennial censuses, as shown in Table 2. The ratio of children under five years of age to the total Indian population (status and non-status) fell from about 19 per cent in 1961 to 16 per cent in 1971 and 13 per cent in 1981. Since during the same period there was a substantial reduction in child mortality, these ratios understate the actual decline in the birth rate. The average number of children born to ever-married women 20-24 years of age fell from 2.3 in 1961 to 1.9 in 1971 and 1.5 in 1981. For those 25-29 years old, the corresponding figures are 3.8, 3.2 and 2.3, or a reduction of 40 per cent. In contrast, the proportion of childless ever-married women rose from 11 per cent in 1961 to 18 per cent in 1971 and 25 per cent in 1981 in the 20-24 age bracket.

After more than a decade of relentless falling, a slowdown or even slight upturn in the birth rate seems to be in the offing, according to the most recent (1979-81) data available for status Indians (Figure 1). However, the meaning of this emerging trend, if it is one, is not clear. It may be nothing more than a statistical artifact, for example, a catch-up on late reporting of births. Alternatively, it could reflect shifts in the age structure (increase in the proportion of women in childbearing ages) and/or a genuine slowdown in the decline of fertility. According to the available estimates, the total fertility rate for status Indians continued to decline, but at a much reduced rate: 3.25 in 1978 to 3.18 in 1980 and 3.15 in 1981, down from six births per woman in 1968 (Ram, 1985). Indeed, it is possible that the transformations of aboriginal society have not yet gone far enough to bring about the full cycle of demographic transition. Instances of such a midway slowdown or temporary lulls in fertility transition are not uncommon (Hirschman, 1986).

Shifts in Reproductive Patterns

A useful distinction is made in the literature on the subject between *parity-dependent* and *parity-independent* birth control, and it is argued that the former was largely absent prior to the secular decline of the birth rate in Europe. The demographic transition, at least in its inception, according to prevailing theory, is achieved primarily through parity-specific birth control, whereby cou-

TABLE 2. VARIATION IN FERTILITY OF INDIAN POPULATION AS MEASURED BY SELECTED INDICES, BASED ON THE 1961, 1971, AND 1981 CENSUSES

Type of measurement	Censuses			Ratio of	
	1961(1)	1971(1)	1981(2)	1971/1961	1981/1961
Average number of children born to ever-married women 15-19 years old	1.262	1.058	0.771	0.84	0.61
Average number of children born to ever-married women 20-24 years old	2.267	1.881	1.494	0.83	0.66
Average number of children born to ever-married women 25-29 years old	3.786	3.169	2.280	0.84	0.60
Percentage of childless ever-married women 15-19 years old	24.09	30.62	42.56	1.27	1.77
Percentage of childless ever-married women 20-24 years old	11.04	17.66	24.65	1.60	2.23
Children 0-4 years old as percentage of total population	18.76	15.67	12.79	0.84	0.68

(1) Includes Band and Non-band Indians only. In 1961 and 1971 Metis were included if they lived on reserves.
(2) Includes Status and Non-status Indians only.
Source: Statistics Canada, 1961 Census, Volume 4.1, Table H-4.
Statistics Canada, 1971 Census, Volume 1.5, Catalogue 92-751. Table 31.
Statistics Canada, 1981 Census, special tabulations.

ples call a halt to childbearing once the desired number of offspring has been attained. The larger relative decline in marital fertility rates at older ages, according to John Knodel (1977), appears to have been a common feature of early demographic transition in Europe and, to some extent, contemporary Asian populations. The remarkable invariability of the age patterns of marital fertility exhibited by both historical and contemporary populations practising little or no family limitation is taken as yet another indication of the absence of parity-dependent birth control among these populations.

A satisfactory analysis of reproductive behaviour in the early phase of fertility decline among aboriginal people calls for an integrated framework, involving an assessment of the contribution to the decline of: *(1)* later starting; *(2)* wider spacing; *(3)* parity-related stopping; and *(4)* age-related cessation of childbearing. There are no data to undertake an analysis of childbearing behaviour of aboriginal Canadians within such an integrated framework; however, some inferences as to the strategy adopted by aboriginal people to curb their fertility can be drawn from an analysis of the general (married and single) age-specific fertility rates and the parity-progression ratios for ever-married women.

Age-specific General Fertility

Table 3 displays trends in the age-specific fertility rates for status Indian women over the period 1968 to 1982. Though manifest across the entire age spectrum, the decline varies in extent with the women's ages. For example, over the observed period of 15 years, there was a reduction of only 22 per cent among women 15-19 years old as against 73 per cent among those 35-39 years old.

The extent to which these downward shifts in the age-specific general fertility rates can be ascribed to changes in the marital status and to reductions in marital fertility cannot be fully determined. Only inferentially, and from the limited data on hand, can one gain some appreciation of their relative importance.

Table 4 sets out the age distribution of the "now-married" women for the last four decennial censuses. It appears that the remarkable stability found in the 1951 and 1961 censuses has given way to a gradual reduction in the proportion of "now-married" as evidenced in the 1971 and 1981 censuses. This reduction, however, is not commensurate with the large decline in age-specific fertility rates. Nor do the two exhibit similar patterns of decline. The "now-married" proportion has diminished much more among younger than older women, whereas the reverse holds true for age-specific fertility.

The picture becomes even more blurred when incidences of common-law and out-of-wedlock births are considered. A significant proportion of aboriginal women, close to 20 per cent according to the 1981 Census, are living in common-law unions. In principle and according to the census definition, they should have been enumerated as married. However, this may not always be the case: some women may find it advantageous to report themselves as single mothers rather than as a common-law partner in order to draw higher wel-

TABLE 3. STATUS INDIAN AGE-SPECIFIC FERTILITY RATE (PER 1,000 WOMEN) CANADA, 1968-1982

Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1968	155.4	310.8	269.7	218.0	159.8	71.1	29.8
1969	146.7	302.9	260.9	206.4	141.1	74.3	20.0
1970	158.9	291.4	247.2	198.7	134.2	60.1	45.6
1971	149.3	280.9	234.4	176.4	123.9	53.9	35.1
1972	155.9	217.5	206.9	166.0	103.8	47.0	22.1
1973	139.5	264.3	188.1	147.1	94.7	38.9	16.1
1974	147.5	248.6	191.1	128.6	80.1	29.0	13.6
1975	140.7	245.9	173.2	123.7	65.6	31.6	9.5
1976	133.0	227.4	171.8	102.5	65.6	33.3	8.5
1977	131.4	230.5	160.4	97.8	59.1	16.3	5.8
1978	124.3	222.0	162.2	96.8	52.0	21.5	2.7
1979	119.6	212.3	152.9	99.1	45.0	18.9	2.4
1980	124.0	213.7	147.5	86.1	44.0	16.1	4.3
1981	126.4	210.3	140.4	82.0	42.8	14.9	6.5
1982	122.6	205.8	152.5	94.8	38.9	14.0	2.6
Index of variation[1]	0.19	0.30	0.43	0.57	0.71	0.78	0.86

(1) The index of variation is calculated here by dividing the three-year average at the end of the period by the three-year average at the beginning of the period and by subtracting from one the quotient thus obtained.

Source: Indian and Northern Affairs Canada, Unpublished data.

These rates have been imputed by Demography Division, Statistics Canada based on unpublished data from Indian and Northern Affairs Canada.

TABLE 4. PERCENTAGE OF INDIAN AND INUIT (ESKIMO) WOMEN MARRIED AT THE TIME OF THE CENSUS BY AGE GROUP, CANADA, 1951, 1961, 1971 AND 1981

Age group	Censuses:				Ratio of:		
	1951	1961	1971	1981	$\frac{1961}{1951}$	$\frac{1971}{1961}$	$\frac{1981}{1971}$
15-19	16.3	16.1	15.1	13.3	.99	.94	.88
20-24	59.6	60.4	59.6	53.6	1.01	.94	.90
25-34	81.7	82.3	80.6	74.7	1.01	.98	.93
35-44	87.2	87.7	84.3	79.3	1.01	.96	.94
45-54	81.2	84.7	80.2	77.1	1.04	.95	.96

Source: 1981 Census of Canada, special tabulation.
1971 Census of Canada, Cat. 92-734, Table 17.
1961 Census of Canada, Vol. 1, Part 3, Table 106.
1951 Census of Canada, Vol II, Table 30.

fare payments (Nolte, 1982). If such misreporting has indeed escalated in recent years, then the decrease observed lately in the proportion of "now-married," particularly amoung younger women, could be partly spurious. Furthermore, out-of-wedlock births are quite prevalent among aboriginal people, especially younger ones. For example, around 1970, about one-quarter of status Indian women aged 20-29, and one-tenth of those aged 40-44 were unwed mothers. From the fragmentary data available, the illegitimacy rate seems to have increased in recent years. A factor which may have contributed to the increase in "single mothers", according to one anonymous reviewer of this paper, was a clause in the Indian Act which resulted in the loss of Indian "status" of an Indian woman and her children if she married someone who was not a status Indian.

An alternate way in which marital status can affect reproduction is via dissolution of conjugal unions. Available data, not reproduced here owing to lack of space, suggest that an increasing proportion of unions whose wives are in their later childbearing years terminate in a divorce or separation. The rise in their incidence has more than offset the lessening of widowhood. As a result, the proportion of women no longer married has tripled in the 35-44 age group, from roughly 5 per cent to 15 per cent between the 1961 and 1981 censuses.

A lesser proportion getting married, later marriage and the greater marital instability that this somewhat perfunctory analysis has revealed have no doubt had their effect on reproduction; but they certainly cannot explain the magnitude of the observed decline in general fertility of aboriginal people. The bulk of this decline must have been achieved through the curtailment of marital fertility. Turning next to the examination of parity-progression ratios will unveil a little of how this came about.

Parity-progression Ratios of Ever-married Women

These ratios indicate the proportion of those who move up from one parity to the next and are derived from the distribution of ever-married women in a given age group by the number of children they reported on the census. They can also be interpreted as the probability that women (in this case ever-married) will give birth to an additional child before a specfied age. They answer such questions as, what is the proportion of women who have, say, a third child among those who had already had two children. Take, for example, ever-married women 35-39 years old in Table 5. According to the 1961 census, 90 per cent of mothers with four children had given birth to a fifth child. The 1981 census indicates that a much diminished proportion, 68 per cent, have

done so. This type of information is particularly relevant to the issue at hand, for it enables one to detect at a given age the incidence of childbearing limitations in relation to the achieved family size over a range of generations.

What does one learn then from the parity-progression ratios set out in Table 5? First, the relative intercensal stability of parity distribution ratios for mothers over age 50 (save for small random fluctuations) can be viewed as yet further indirect evidence of the prevalence of a relatively uncontrolled marital fertility prior to the 1960s. The 1961 census series could actually be regarded as reflecting the regime of "natural" fertility – one characterized by the absence of significant family limitation within marriage – and therefore serve as a bench mark for gauging the decline in parity ratios among younger generations revealed by the two subsequent censuses.

Second, this relative stability in the parity distribution typical of "natural" fertility has been shattered by what appears to be an upsurge in parity-related birth control after 1961. The 1971 census, and the 1981 Census even more, reveal a sharp downward shift in the higher parity-progression ratios as compared to that of 1961. There is apparently a growing tendency to put the brakes on childbearing once a desired family size has been achieved. The message that seems to come through loudly and clearly is that family size-related birth control has made significant inroads into the procreative behaviour of aboriginal women.

Third, there is yet another message, this time conveyed by shifts in the lower parity range among the youngest of the recent generations of mothers. For example, the proportion of ever-maried women 20-24 years old who had their first child dropped from 89 per cent in the 1961 census to 74 per cent in the 1981 census. The proportion of those with at least two children in that age group went down from 78 per cent to 61 per cent respectively. These trends suggest that birth control is gaining momentum apparently in response to *timing* considerations, independent of, or in addition to, family size considerations. The timing of childbearing has two dimensions to it – the starting and the spacing. Are aboriginal women now having their children later? Do they space them farther apart than in earlier days? These are obviously important questions, the answers to which will help us understand how the demographic transition has been set off.

According to a 1968 survey this author carried out in several traditional Indian communities of the James Bay area, the average age of women at the birth of their first child was 21.9 years among those who survived to age 45 and who were married at least once (Romaniuk, 1984). No data of this kind have since been collected for these or other communities. However, the sharp rise in the childlessness of ever-married women in the 20-24 age group from

TABLE 5. PARITY-PROGRESSION RATIOS, INDIAN EVER-MARRIED WOMEN BY AGE GROUP, CANADA, SELECTED YEARS

Ages	Census year	Birth order						
		1st	2nd	3rd	4th	5th	6th	7th
65+	1961	.90	.94	.89	.90	.87	.81	.83(2)
64+	1971	.91	.92	.90	.89	.89	.85	.86
60+	1981	.92	.93	.91	.89	.89	.85	.87
55-59	1961(1)	NA	NA	NA	NA	NA	NA	NA
	1971	.92	.93	.90	.89	.88	.88	.85
	1981	.93	.93	.92	.91	.89	.87	.83
50-54	1961(1)	NA	NA	NA	NA	NA	NA	NA
	1971	.92	.94	.90	.90	.89	.85	.86
	1981	.92	.94	.90	.89	.86	.85	.86
45-49	1961	.93	.95	.94	.92	.92	.87	.84(2)
	1971	.94	.94	.91	.90	.87	.88	.87
	1981	.94	.95	.91	.86	.85	.83	.87
40-44	1961(1)	NA	NA	NA	NA	NA	NA	NA
	1971	.94	.94	.91	.90	.89	.85	.86
	1981	.95	.94	.87	.82	.81	.76	.74
35-39	1961	.94	.95	.93	.93	.90	.89	.81(2)
	1971	.94	.95	.90	.87	.86	.84	.81
	1981	.94	.92	.79	.74	.68	.68	.65
30-34	1961(1)	NA	NA	NA	NA	NA	NA	NA
	1971	.95	.94	.88	.83	.80	.75	.71
	1981	.92	.87	.68	.61	.57	.57	.51
25-29	1961(1)	NA	NA	NA	NA	NA	NA	NA
	1971	.90	.86	.75	.70	.62	.56	-
	1981	.87	.79	.55	.48	.42	.48	-
20-24	1961	.89	.78	.63	.46	.34	-	-
	1971	.82	.68	.51	.43	.41	-	-
	1981	.74	.61	.40	.35	.26	-	-

(1) Not available.
(2) The 1961 ratios refer to 7 or more children.
Source: 1971 and 1981 - Statistics Canada, special tabulations, referring to Indians and Inuits. The 1961 Census unpublished data were obtained by courtesy of Professor J. Henripin, referring to Indians only.

11 per cent in the 1961 census to 25 per cent in the 1981 census definitely points to the advent of a reproductive pattern characterized by a later commencement of childbearing.

While the parity-progression ratios suggest a slowdown in the *tempo* of family formation from one generation to the next after 1961 or so, there is no way of disentangling the underlying processes. The relative contribution of the "stopping" and "spacing" cannot be inferred from these ratios. The cohorts of ever-married women undergoing the process of family formation are a mixed bag of childbearing performers. There are those who were able to terminate procreation successfully once they attained the desired family size and thus become "stoppers." Aside from genuine "spacers", there are those waiting longer before another pregnancy owing to temporary sterility or marital disruption. Wider spacing in some cases may be the outcome of the failure to stop at a desired parity because of ineffective birth control. There is also a selection process at work of highly fecund women who either do not practise any birth control or are ineffective in practising it, a process that tends to push up progression ratios at the high parity range. While the less fecund and effective contraceptors drop out of a cohort, highly fecund and inefficient contraceptors continue having children and reaching ever higher parities.

Whether there was any age-related downward shift in the cessation of childbearing over time through greater use of contraception, independent of parity, remains an open question in the absence of relevant data. There is no evidence, direct or indirect, on the age of birth termination. Only the 1968 survey among James Bay aboriginal communities, referred to earlier, contained such information. The average age at which mothers gave birth to their last child, according to that survey, was 38.7 years for those who survived to at least age 45 and were still married or had been married at least once before that age. This age is somewhat lower than that observed among non-contraceptive high fertility populations, such as the Hutterites (40.9), and could suggest the existence of some limited practice of birth control at the tail end of the reproductive span, prior to the onset of decline in fertility.

The conclusions based on the above analysis are perforce tentative. Canadian aboriginals do not seem to have differed greatly in their behaviour from European populations when they entered the demographic transition. Much like the latter, they seem to have been guided primarily by family size considerations. In more recent years, they have espoused alternative reproductive strategies – starting to have children later and possibly spacing them farther apart.

Thus, in order of their occurrence, the parity-related family limitation appears to have been the dominant mechanism at the early stage of the demo-

graphic transition. The advent in recent years of later starting and wider spacing could be indicative of a broadening of the grounds of birth control to accommodate both family size (parity) and timing considerations. Thus, a more advanced stage of fertility transition is in the offing, if not already attained, among Canadian aboriginals. All these strategies had to be brought to bear in order to achieve the scale of fertility decline witnessed among these populations since 1960.

Selected Social Fertility Differentials

"The most widely recognized change in reproductive behaviour associated with modernization is the shift from high to low fertility," notes Easterlin in one of his recent works (Easterlin, 1983). But history also teaches that the process does not unfold simultaneously throughout the masses of the population but sequentially, starting with groups in the vanguard of social change, then gradually permeating the lower strata of the society. The emergence of social, economic and residential differentials in fertility is the hallmark of early transition to modernity. The analysis of fertility differentials by rural-urban and educational attainment, observed among aboriginal people of Canada, reveals behaviour typical of the early demographic transition.

Rural/Urban Differentials

The relevant data from the 1961, 1971 and 1981 censuses in Table 6 reveal the existence of substantial differences in the fertility levels between urban and rural areas among the younger generations of aboriginal people. The 1981 ratio of urban to rural nonfarm, in terms of average number of births per ever-married woman, stands at 0.46 for women aged 15-19, 0.65 for those 20-24 and 0.69 for those 25-29. Furthermore, fertility has declined more rapidly in urban than in rural communities. If the three youngest age groups (15-29) are taken together, the number of children per woman between the 1961 and 1981 censuses diminished by 29 per cent in rural nonfarm, 35 per cent in rural farm and 42 per cent in urban areas. The greater decline of fertility in the rural farm than in the rural nonfarm settlements is not surprising. The former are generally situated in the south, whereas the latter are found in the north and are less exposed to modern influences. It should be noted that according to the 1981 census, only 2 per cent of all aboriginal people have been categorized "rural farm," as compared to 56 per cent "rural nonfarm" and 42 per cent "urban".

TABLE 6. AVERAGE NUMBER OF CHILDREN EVER-BORN TO EVER-MARRIED INDIAN[1] WOMEN BY TYPE OF RESIDENCE, 1961, 1971 AND 1981 CENSUSES

Average number of children per ever-married women	Rural farm			Rural non farm			Urban		
	1961	1971	1981	1961	1971	1981	1961	1971	1981
15-19	1.33	1.26	0.88	1.26	1.20	0.98	1.26	0.82	0.45
20-24	2.52	2.19	1.63	2.36	2.19	1.78	1.88	1.51	1.15
25-29	4.08	3.79	2.49	4.02	3.70	2.70	2.83	2.47	1.85
30-34	5.71	4.78	3.57	5.33	5.46	3.55	3.83	3.80	2.51
35-39	5.79	5.69	3.90	6.64	6.45	4.73	4.89	4.58	3.16
40-44	7.11	5.63	4.58	7.10	7.15	5.74	4.97	4.96	4.00
45-49	7.17	7.20	5.76	6.91	7.22	6.73	5.40	5.80	4.92
50-54	7.24	6.78	8.32	6.17	7.04	6.85	5.16	4.91	5.02
55-60	6.68	6.70	7.25	6.23	6.67	7.36	4.73	4.93	5.25
60-64	5.24	6.42	6.25	6.00	6.48	7.18	6.41	4.53	4.98
65-69	5.90	6.91	4.56	5.81	6.29	7.19	5.75	4.67	4.44
70+		5.53	5.98		6.35	6.77		4.97	4.88

(1) Includes status and non-status Indians only.
Source: 1961 Census of Canada, Bul. 4.1-8.
1971 Census of Canada, Statpak.
1981 Census of Canada, special tabulation.

Urbanization can influence reproductive behaviour in a variety of ways. One is via exposure to a life style typical of industrial/urban societies, a life style that promotes alternative options to childbearing. The aboriginals born or taking up residence in a city are faced with a different set of economic constraints and develop a different set of aspirations. In the traditional Indian setting, the economy is still centred on the household and on the children's participation in it. By contrast, the children's contribution to the family's finances is likely to be minimal in the city. It follows therefore that the cost of children may well outweigh the benefit and thus constitute a disincentive to childbearing. As a group, aboriginal women in the cities are better educated and more likely to engage in gainful activities outside the home. Yet, at the same time, they are likely to lack the kinship support still available in rural areas to take care of their children while they are working. Finally, the tastes and aspirations for material goods and comfort that city life promotes, may also act as a deterrent to childbearing. Consumerism may exert a stronger influence on them, given the deprivation they experienced in their native communities.

Another way in which rural/urban differentials come into being is via kinship relationships. The kinship network with its support of traditional fertility-

oriented values still remains a potent factor in rural native communities, but it breaks down in the urban environment. Thus, there is little protection against the fertility-depressing influence referred to in the previous paragraph.

Finally, the availability of modern contraception is yet another avenue by which rural/urban differentials originate. Although there are few statistics available, it can be safely surmised that aboriginal city dwellers are better served in this regard. There is some evidence that resistance from the family and the community to birth control is still felt in the villages. In some communities, the use of contraception is seen as promiscuous behaviour, even among married women. Because of cultural beliefs, abortion apparently is not considered as an option, not even in extreme cases, such as teen pregnancy or pregnancy resulting from rape (Nolte, 1982).

Differentials by Level of Education

It is widely recognized that educational attainment is one of the most significant determinants of procreative behaviour. Owing to the work of Rindfuss and others (1980), the underlying mechanism is now fairly well understood. To begin with, education affects the age at which the first child is born. Since the proportion of aboriginal women who go on to secondary and post-secondary education has increased considerably in recent years, one would expect a commensurate delay of first birth.

Second, education is likely to affect procreation through the knowledge and acceptability of contraceptive methods. Those with higher education are likely to have a better knowledge of contraceptive methods and be more willing and able to use them effectively. Third, acquired aspirations and skills promote nonfamily roles, and thus affect the timing of childbearing and family size preferences. Adolescents with high educational and occupational goals "are likely to choose social patterns conducive to later marriage and a later start in childbearing" (Rindfuss *et al.*, 1980). The extent to which these assumptions hold true for the aboriginal society has still to be verified.

Table 7 reveals the existence of significant fertility differentials associated with educational attainment. Status Indians have been chosen to illustrate the magnitude of these differentials. Most of them live on reserves or continue to have ties with the reserves, even though some of them may be residing elsewhere temporarily. Consequently, they are more likely to exhibit traditional patterns of behaviour than non-status Indians who are more completely integrated into the social fabric of Canadian society. Thus, education appears to be a powerful factor in the differentiation of childbearing performance, even

in the relatively traditional milieu of status Indians. The average number of children of ever-married women with post-secondary education is substantially smaller than those who have only completed grade nine or less. The gap between those with post-secondary and those with less than grade nine education widens with each younger generation.

Concluding Comments: An Agenda for In-Depth Research

This paper has documented the occurrence of both a sharp decline in fertilty and the social differentials in its level that are typical of demographic transition. The strategy adopted by Canadian aboriginals to control their fertility

TABLE 7. AVERAGE NUMBER OF CHIDLREN BORN TO STATUS INDIAN WOMEN BY AGE OF MOTHER AND LEVEL OF SCHOOLING, CANADA, 1981 AND 1971 (INDIAN-BAND)

Age of mother	Level of schooling							
	Less than grade 9		Grades 9-13		Post-secondary		Ratio of post-secondary to less than grade 9	
	1971	1981	1971	1981	1971	1981	1971	1981
15-19	1.31	1.13	0.87	0.76	0.65	0.57	0.50	0.50
20-24	2.40	2.33	1.66	1.54	1.27	1.15	0.53	0.49
25-29	3.83	3.43	2.80	2.37	2.03	1.90	0.53	0.55
30-34	5.45	4.14	4.11	3.06	3.20	2.56	0.59	0.62
35-39	6.29	5.14	4.73	3.68	4.07	3.29	0.65	0.64
40-44	6.74	6.07	5.27	4.38	4.42	3.76	0.66	0.62
45 +	6.46	6.85	4.89	5.12	3.47	4.75	0.54	0.69

Source: Statistics Canada, 1981 Census of Canada, special tabulation.

seems to involve a combination of leverages: parity-dependent limitation of births, later commencement of childbearing, and wider child spacing. However, parity-related control was the first to occur and was the dominant strategy at the earlier stage of their demographic transition. Later starting and wider spacing behaviour followed at some distance. Thus, the grounds of birth control have been progressively broadened to accommodate considerations of both the family size (parity) and the timing of childbearing.

The challenging but complex task ahead concerns the *processes* of the decline. What are the underlying factors and mechanisms? The completion of this task will require an elaborate research design involving multivariate analysis of microdata, available from the 1971 and 1981 Canadian censuses. This would have to be supplemented by the data and observations on various relevant facets of aboriginal life from anthropological literature. So far untapped by demographers, this source could provide valuable information on aspects of the process that escape quantitative analysis.

A host of theoretical issues prominent in the literature on the transition to low fertility need to be addressed. At the centre of the debate is the question of whether this transition is an *adjustment* or *an innovation* process.

The first implies that the decline of fertility came primarily as a response to the new, modern social and economic conditions. People may limit the number of their offspring when faced with deprivation, and in the case of Indians this could be the mounting pressure of population on the available reserve landholding that followed the rapid reduction in their mortality. Alternatively, in Kingsley Davis' (1963) formulation of the adjustment theory, they may do so to take advantage of growing economic opportunities in order to improve their living standards. Were aboriginals generally ignorant of birth control prior to the onset of the decline? Or were they already practising birth control on a limited scale, only resorting to its wider use in recent years as a result of new social conditions that provided the motivation for reduced fertility? One variant of the "adjustment" hypothesis worthy of testing is the so-called "threshold hypothesis." It postulates that a certain level of social and economic development is required to trigger fertility decline (Cutright and Hargens, 1984).

Transition to low fertility as an innovation process involves the diffusion throughout and imitation by the aboriginal minority of the family limitation practices prevalent in Canadian society. The landscape of diffusion of reproductive innovation is interesting, both substantively and theoretically. Are there any distinct regional patterns suggesting that larger urban centres influence the neighbouring hinterland, or that there is a gradual spread of controlled

fertility patterns from the more developed aboriginal settlements in the south to those in the remote north?

In actuality both processes – structural changes/adjustment and innovation/diffusion – might have been at work, either simulteneously or in some kind of succession, to produce fertility decline. To avoid ambiguity, however, the research design requires that the two be clearly differentiated conceptually.

This research also offers an opportunity to address issues raised within the framework of the so-called "minority status hypothesis." There is a great deal of discussion on such dimensions as *insecurity* and *marginality* associated with minority status (Trovato and Burch, 1980). In the case of aboriginals, the focus should be on the social dimensions that are either likely to impede or facilitate the demographic transition. In this connection, consideration should be given to such aspects as the prevalence of single motherhood (a prominent feature of the reproductive behaviour of both traditional and modern Indian societies), the *de facto* unions, husband/wife communication, and native peoples' ethnocentrism as a shield against demographic erosion.

The way in which the interaction between aboriginal and non-aboriginal institutions molds the attitudes and behaviour of aboriginals in the matter of procreation should be explored as well. In this regard, the influence of the all-pervasive government welfare system in aboriginal communities is of particular interest.

The work by I. Pool (1977) on the Maori population of New Zealand, and that of A. Gray (1981) and others on the fertility decline of Australian aborigines, along with research in Canada, could serve as a basis for a comparative study of the demographic transition of aboriginal minorities. Aboriginals of these three countries, geography notwithstanding, share many similarities in their historical background, political conditions and modernization process.

Such is *grosso-modo* the agenda for in-depth research in order to elucidate the causal complex underlying the aboriginal peoples' transition from traditional high to modern low fertility.

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