

CHILDLESSNESS IN ONTARIO AND QUEBEC: RESULTS FROM 1971 AND 1981 CENSUS DATA

K. Vaninadha Rao

*Population Studies Center, The University of Western Ontario,
London, Ontario, Canada*

Résumé — Nous analysons les tendances et facteurs de l'infécondité volontaire chez les femmes non-célibataires au Québec et en Ontario selon les données d'échantillon pour les recensements de 1971 et 1981. À base de la régression logistique, nous faisons une analyse multivariée de la parité comme variable en dichotomie. La proportion sans enfants augmente aux âges de reproduction. Les facteurs principaux sont l'âge au mariage, la durée du mariage, le revenu, la participation dans la main d'œuvre, la religion autre que Catholique, le fait de déclarer aucune religion, et la résidence dans un grand centre métropolitain. Une comparaison est faite des cohortes qui se trouvent aux deux recensements.

Abstract — The purpose of this paper is to analyze trends and correlates of childlessness among ever-married women in Ontario and Quebec, drawing data from 1971 and 1981 Public Use Sample Tapes. Logistic regression is used for a detailed multivariate analysis of parity status as a dichotomous dependent variable. Results from the analysis indicate an increase in the proportion childless among ever-married women in the reproductive ages. Age at marriage, marriage duration, income, other income, labour force participation, religiously non-Catholic or no religious affiliation, and large urban residence are found to be the major associates of childlessness in Ontario and Quebec. Comparisons among cohorts of women who were present in 1971 and 1981 are discussed.

Key Words — **childlessness, ever-married women, logistic regression, cohort approach**

Introduction

The recent phenomenon of below replacement fertility levels in developed countries has drawn the attention of many demographers, and other social scientists. The importance of childlessness is often not well recognized or analyzed compared to the voluminous literature on other facets of human reproductive behaviour. The changing norms and value systems, particularly among the Western nations, suggest that childlessness can be a potential contributor to already existing low levels of fertility in recent decades. Schapiro (1980) predicted that with declining fertility, the incidence of childlessness is almost certain to increase in the near future. It has been argued that in fact motherhood is becoming a matter of taste and is often in competition with other social roles (Bumpass, 1973). In this type of scenario childlessness among ever-married women may arise more through voluntary reasons rather than involuntary causes. In particular, if the percentage of childlessness increases by more than 10 among couples, one may suspect that is an outcome of voluntary childlessness or of irregular exposure to childbearing rather than involuntary (Bogue, 1969).

Voluntarily childless women are assumed to be fertile, but not inclined to engage in reproduction and family building, whereas involuntary childlessness arises from the physiological limitations for having children. However, it is very difficult to distinguish between these two, even with in-depth interviews, because of the sensitivity involved in the subject. As a consequence of this, research dealing with voluntary and involuntary childlessness is rare (Kiser, 1939; Popenoe, 1943; Whelpton and Kiser, 1950). Generally, studies on childlessness often draw from data collected for other themes and purposes. Intensive personal interviews with regard to motivations and aspirations of women may help to identify voluntary and involuntary childlessness to some extent; but such an exercise demands huge human and financial resources which are rarely available for a phenomenon that has still to establish its importance in the views of policy planners and practising demographers. There are some microstudies dealing exclusively with voluntary childless couples in Canada and elsewhere, but the samples are not representative at the provincial or national levels (Veevers, 1973, 1980). Some other studies using 1971 Canadian census data, analyzed national trends and correlates of childlessness using a variety of statistical techniques (Carliner *et al.*, 1980; Grindstaff *et al.*, 1981; Tomes, 1985; Wolowyna, 1977).

Census data provides reliable and factual information on many social, socioeconomic and demographic characteristics of women; and because of this coverage has a definite edge over many other sample surveys. Balakrishnan

and colleagues in their analysis of 1971 census data in Canada noted that the higher rate of childlessness among younger women in the 20-30 age group contributed to a more than 50 per cent increase in childlessness from 1961 (Balakrishnan *et al.*, 1979). The authors attribute this drastic change to effective contraception, availability of abortion, and other social and cultural factors coupled with changing sex roles in Canadian society. Recent studies carried out in the U.S.A., using the data from 1980 Current Population Survey, projected an increase in childlessness in the future among young American women (Bloom, 1982a, 1982b). The 1980 Quebec survey shows that almost 10 per cent of those married in 1971-75 expressed their intention to remain childless (Romaniuc, 1984:33). It is to be seen how far these expectations remain intact. One can always argue that these expectations probably underestimate the level of childlessness, since repeated postponement by some women may leave them child free. In a recent article Pol (1983), using panel data, found that among ever-married women changing intentions from more than zero children to zero children was associated with higher levels of education, a slightly higher income, labour force participation and low religiosity. This panel study showed that the intention to remain childless was more stable than the intention to have children. Current trends in contraceptive use and changing sex roles, norms and values seem to favour a rise in intentional childlessness (Veevers, 1979).

This paper focuses on two Canadian provinces, Ontario and Quebec, to study the trends and correlates of childlessness among ever-married women, using 1971 and 1981 census data. Though these provinces are neighbours, they differ remarkably with respect to ethnicity, religion, and historical and cultural background. According to the 1981 census, these two provinces contain about 60 per cent of Canada's population, representing the two major ethnic groups - the British and the French. In particular, these two provinces consist of about 50 per cent British and about 93 per cent French ethnicity in 1981. Further, about 62 per cent of all ever-married Canadian women were in Ontario and Quebec in 1981. Being the two most populous provinces in Canada, they are expected to influence significantly the national demographic picture. Recent data from the 1981 census confirm the relatively lower level of Quebec fertility compared to that of other provinces (Romaniuc, 1984:16). French Canadians traditionally had more children than the English, until the early 1960s. Since then, this trend seems to have been reversed. The rapid decline in Total Fertility Rate (TFR) from 4.0 in 1957 to a low of 1.5 in 1982 in Quebec, compared to a TFR decline from 3.7 to 1.7 in the same period in Ontario, has defied a satisfactory explanation to date. It is this context that has

drawn our attention to selecting these two provinces for a detailed study of childlessness in Canada.

Data and Methods

The data for this study come from the Public Use Sample Tapes of Statistics Canada, 1971 and 1981, based on individual files. In this paper, we focus on ever-married women in the reproductive ages, as fertility outside these ages is almost universally negligible. The use of census sample tapes allows one to perform a detailed analysis at the individual level with large sample sizes, thus making it ideal for this type of study because of the low incidence of the phenomenon being studied.

A main limitation of census data is that we cannot distinguish between voluntary childlessness and involuntary childlessness. Lack of information on contraceptive use and normative behaviour makes it difficult to interpret childlessness, even within given marriage durations. We construct hypothetical cohorts of ever-married women from 1971 and 1981 census data to observe cohort trends during that decade. Comparison of the cohorts becomes feasible by selecting only those women who were present at the 1971 and 1981 censuses. This is achieved by controlling for the year of immigration in 1981. In other words, women who immigrated after 1971 were excluded from the 1981 data. We have selected broad ten-year age groups and planned a separate analysis for each of the cohorts at the two points of time. The age groups considered for ever-married women are 15-24, 25-34, 35-44 and 45-49. The last group of women can be treated as a completed fertility group.

We employed a dichotomous dependent variable with value one for being childless and zero for having one or more children. Since this dummy variable has an extremely skewed distribution, logistic regression was chosen for detailed multivariate analyses. Methodologically, logit models are superior to the usual regression or Multiple Nominal Analysis techniques, whenever a dummy dependent variable is involved (Nerlove and Press, 1973; Amemiya, 1981). In this paper, we employ the maximum likelihood logit model, which can handle the dichotomous nature of a dependent variable as well as continuous and dummy predictors. It has been found that childlessness is closely associated with age at marriage and marriage duration in Canada (Grindstaff *et al.*, 1981). In a recent study using 1971 census data, Tomes (1985) found that religion, place of birth, rural/urban residence, and income (both wife's and husband's) are as statistically significant as age at marriage and marriage duration in the study of childlessness in Canada.

Based on earlier research in Canada and elsewhere, we selected important socioeconomic and demographic variables as theoretically possible correlates of childlessness, which include both ascribed and achieved characteristics of ever-married women. They are age at marriage, marriage duration, education (years of schooling), personal income, other income, work status (with two categories — in labour force and not in labour force), place of residence (urban/rural residence in 1971, and in Census Metropolitan Area (CMA)/not in CMA for 1981), religion (with four categories - Catholic, Protestant, no religion and other), ethnicity (with four categories - British, French, other European and other), place of birth (native/foreign born), and mother tongue (with three categories - English, French and other). In the model, age at marriage, marriage duration, education and income are introduced as continuous variables. To capture the U shaped and inverted U relationships presumed to be present between age at marriage, marriage duration, education, income and childlessness, we introduced squared, cubed and higher-order polynomial terms into the model. Higher order terms for the above predictors are retained in the model as long as they meet the statistical criterion of significance at 10 per cent level.

Previous research findings indicate that income has both negative and positive effects for childlessness. Poston (1974), analyzing U.S.A. data examined the relationship between income and childlessness and found that this relationship need not always be a negative one. Tomes (1985) found that the wife's earnings and the husband's earnings act in opposite directions, in that a higher husband's income reduces the probability of childlessness in Canada whereas a higher wife's income increases it. In view of these empirical findings, we introduced two income variables into the model, representing the wife's income from wages and self employment, and the other family income expected to represent the husband's income. A preliminary analysis, with all predictors in the model, including the higher order terms of age at first marriage, marriage duration, education, income and other income, was carried out to identify the correlates of childlessness. On the basis of this preliminary analysis, we made our final choice of predictors and their higher order terms for the model. As a result of this, we have a different set of correlates for different age cohorts in 1971 and 1981 for Ontario and Quebec. The results of the final model are discussed in the following section.

Discussion of Results

Table 1 indicates that the proportion childless among ever-married women has increased during the last decade in both provinces. This trend can be placed in the context of the steady decline of Canadian fertility in recent decades. The table shows that a higher proportion of Quebec's ever-married women have opted for childlessness than their counterparts in Ontario in 1981. In Quebec, childlessness among ever-married women can be seen as more of a contributor to the overall lower level of fertility in 1981 compared to other provinces. The proportion of the childless increased from 1971 to 1981 in both provinces until the age group 35-39. The emerging trend towards an increase in the proportion of childlessness among younger women can be attributed to voluntary childlessness, since there is no valid reason for assuming an increase in sterility. The overall proportion of childless ever-married women in the reproductive ages increased from 17.3 to 20.2 per cent in Ontario, compared to the increase from 16.8 to 22.0 per cent in Quebec from 1971 to 1981, respectively.

Table 2 displays the proportion of the childless women controlling for age and marital duration in Ontario and Quebec for 1971 and 1981. This table shows that the proportion childless has increased substantially from 1971 to 1981 at given age and marital duration in both provinces. About 11 per cent of ever-married women were childless with 10-14 years of marital duration, compared to about seven per cent in 1971. Table 2 clearly shows a sharp increase in the proportion of childless for every age group, within about fifteen years of marital duration in both provinces. According to the 1980 Quebec survey, almost nine per cent of those married between 1976 and 1980 do not plan to have any children (Romaniuc, 1984:63). This trend among recently married cohorts suggests that an increasing number of married Canadian women are either postponing motherhood or preferring child-free life styles. The same trend among younger cohorts of white women has been observed in the U.S.A. (Poston and Gotard, 1977). Repeated postponement of childbearing might lead to permanent postponement, thus increasing the proportion of childless over the age groups with longer marriage durations. Changing economic and social conditions, coupled with increasing aspirations for education and career plans, demand that both partners work outside the family. Analyzing 1971 Canadian census data, Grindstaff and colleagues predicted that childless women are two to three times as likely to be gainfully employed as other women (Grindstaff *et al.*, 1981). According to census data, the labour force participation of ever-married women increased from 33 per cent and 49 per cent in 1971 to 57 per cent and 68 per cent in 1981, in Quebec and Ontario, respectively.

TABLE 1. PROPORTION OF CHILDLESS EVER-MARRIED WOMEN IN ONTARIO AND QUEBEC

Age at the time of Census	ONTARIO		QUEBEC	
	1971	1981	1971	1981
15 - 19 #	52.9 164	66.8 143	58.0 69	74.4 128
20 - 24 #	43.1 868	54.1 992	43.4 556	60.3 932
25 - 29 #	22.3 542	31.8 948	23.2 435	29.4 645
30 - 34 #	9.8 218	14.9 488	9.0 157	13.5 326
35 - 39 #	6.7 146	9.4 253	8.7 139	10.0 212
40 - 44 #	9.4 208	6.7 161	8.2 132	10.1 160
45 - 49 #	9.5 202	7.1 155	10.1 155	9.3 148
Total #	17.3 2348	20.2 3140	16.8 1643	22.0 2551

Though one can argue about the simultaneity of labour force participation and childlessness, for the purpose of this study, we assume that labour force participation leads to postponement of motherhood and thus to childlessness, rather than vice versa. Increased opportunities and career aspirations may force many would-be mothers to consider childbearing as an obstacle for advancement.

Many studies on the childlessness of Canadian or other women have suggested that age at marriage and marriage duration are two important demographic factors, as well as some achieved and ascribed characteristics (Grindstaff *et al.*, 1981; Tomes, 1985; Veevers, 1979). Table 3 shows the mean age at marriage by age at census in 1971 and 1981, by parity status, in Ontario and Quebec. The table indicates that, in both provinces, childless women always had a higher mean age at marriage than women with children. Though one can observe a slight decline in the mean age at marriage from 1971 to 1981 among all women, childless women maintained a consistently

TABLE 2. PROPORTION OF CHILDLESS EVER-MARRIED WOMEN BY AGE AND BY MARITAL DURATION IN ONTARIO AND QUEBEC

AGE AT THE TIME OF CENSUS	ONTARIO MARITAL DURATION (IN YRS.)						QUEBEC MARITAL DURATION (IN YRS.)					
	0-4	5-9	10-14	15-19	20-24	25+	0-4	5-9	10-14	15-19	20-24	25+
<u>1971</u>												
15-19	52.9						58.0					
20-24	50.5	10.0					48.7	8.4				
25-29	46.2	12.8	3.6				43.3	12.2	5.7			
30-34	47.3	13.4	5.4	2.1			40.5	8.9	4.7	3.3		
35-39	31.3	15.6	8.2	4.0	3.8		52.0	26.0	7.1	5.1	2.7	
40-44	73.3	37.5	17.2	10.2	5.6		61.5	37.5	11.8	8.2	4.5	3.9
45-49	60.0	45.5	21.7	14.6	9.6	6.6	62.5	58.8	44.7	13.9	8.8	6.7
Total	49.4	13.6	7.1	6.6	6.8	5.9	47.2	12.8	7.0	6.9	6.0	6.3
#	1469	337	175	150	138	79	1021	246	124	111	86	55
<u>1981</u>												
15-19	51.4						68.2					
20-24	60.7	16.2					59.2	17.5				
25-29	59.7	22.3	6.5				49.9	17.1	6.4			
30-34	45.7	21.9	9.4	3.5			36.3	14.3	8.4	3.2		
35-39	46.6	17.5	13.1	6.2	3.6		40.5	25.0	12.1	5.0	4.9	
40-44	47.4	29.7	21.3	7.5	4.0	2.1	53.8	46.2	26.9	8.0	5.1	5.7
45-49	100.0	52.6	24.4	15.1	7.8	4.5	81.8	72.4	38.0	12.3	9.1	3.1
Total	58.4	21.5	10.6	6.5	4.9	4.1	54.2	17.9	11.0	6.0	6.4	3.5
#	1400	655	314	158	106	71	915	411	241	105	89	35

TABLE 3. MEAN AGE AT FIRST MARRIAGE BY AGE AND BY PARITY STATUS FOR EVER-MARRIED WOMEN IN ONTARIO AND QUEBEC

AGE AT THE TIME OF CENSUS	YEAR	ONTARIO		QUEBEC	
		ZERO PARITY	1+ PARITY	ZERO PARITY	1+ PARITY
15-19	1971	17.8	17.1	17.7	17.2
	1981	17.6	16.7	17.6	16.9
20-24	1971	20.7	18.9	21.0	19.6
	1981	20.3	18.6	20.3	19.1
25-29	1971	22.9	20.4	23.2	20.8
	1981	22.4	20.0	22.5	20.5
30-34	1971	24.7	20.9	25.6	21.7
	1981	23.7	20.8	23.8	21.5
35-39	1971	24.9	21.7	26.5	22.1
	1981	24.1	21.2	24.9	21.7
40-44	1971	26.5	22.1	26.8	22.7
	1981	25.7	21.3	26.2	21.7
45-49	1971	25.7	22.7	26.9	22.8
	1981	25.7	21.4	29.3	22.3
Total	1971	22.6	21.2	23.4	21.8
	#	(2348)	(11187)	(1643)	(5138)
	1981	22.4	20.8	22.9	21.4
	#	(2704)	(12011)	(1796)	(8519)

higher mean age at marriage for all age cohorts in both provinces compared to women with children. The overall mean age at marriage for Quebec women with zero parity is slightly higher than the corresponding figures for Ontario at both census points. This may be partly due to the overall lower level of fertility in Quebec compared to Ontario. In the presence of increasing divorce rates, one can question the importance of marriage as an institution and its role in childbearing. As Romaniuc states, "It is increasingly acceptable to have a marriage without parenting ... to parent without marriage" (Romaniuc, 1984:35). At least some of the women who wish to have a child are likely to change their intentions because either a divorce precedes the time that the couple planned to have their first baby or their hopes for a stable family unit are not met (Menken, 1985). In a recent study of marriage dissolution in Canada, Balakrishnan and colleagues confirmed the rapid increase of dissolutions,

especially among the young and more recently married cohorts (Balakrishnan *et al.*, 1987). It is possible that younger cohorts are more afraid of marriage dissolution, and as a result they may tend to concentrate on individual achievements and postpone childbearing and family formation to some extent. Postponement of childbearing to the later years of life reduces the reproductive span and thus increases the chances of being childless. Moreover, a year of unprotected intercourse for a women of age 20 involves a higher risk to pregnancy than if she were aged 30. The results of the above analysis doubtless demonstrate the fact that childlessness is associated with a relatively higher mean age at marriage in both provinces in 1971 and 1981. However, one should view this trend as a problem of cause and effect, since premarital conception or birth are expected to lead to an early marriage (Rao and Balakrishnan, 1986).

Tables 4A and 4B display the results of logistic multivariate analyses. Separate equations were considered for different age cohorts in 1971 and in 1981, for both Ontario and Quebec. The age cohort of 15-24 in 1971 is 25-34 in 1981. Similarly, other respective cohorts between the two points of time can be followed. Tables 4A and 4B display the respective regression coefficients and approximate *t* values (coefficient/standard error). The importance of the predictors can be identified through the significance of *t* values. In general, a predictor with a *t* value of 1.96 is said to be significant at five per cent level.

Marriage duration and age at marriage are the two demographic variables considered in the present study. Previous research by Grindstaff and colleagues, and Tomes, showed that age at marriage and marriage duration are the most important demographic predictors of childlessness in Canada in 1971. We introduced square, cube and higher order polynomial terms of age at marriage and marriage duration into the model to allow nonlinear relationships. The analyses show that the second and third order terms of age at marriage are not significant at 10 per cent level, in both provinces and at both points of time. Age at marriage is significant for older cohorts (above age 35), with the sole exception of the 45-49 cohort of Quebec in 1981. The coefficients for age at marriage are positive, indicating that higher age at marriage is associated with higher chances of being childless for the cohorts 35-44 and 45-49 in 1971 and 1981. The coefficients on the polynomial terms of marriage duration alternate their sign, indicating a highly nonlinear relationship between marriage duration and childlessness. Marriage duration is very important for younger cohorts (below age 35) in both provinces, at both points in time. In Quebec, marriage duration is consistently significant at all ages in 1981. The negative effect of marriage duration on childlessness can be observed throughout the age cohorts and time periods, with few exceptions. The analysis shows that an increase of marital duration by one year reduces the chance of being

TABLE 4A. LOGIT REGRESSION COEFFICIENTS FOR THE
SELECTED EXPLANATORY VARIABLES, ONTARIO

Independent Variables	1971				1981			
	15-24	25-34	35-44	45-49	15-24	25-34	35-44	45-49
AGE AT MARRIAGE (AQMAR)	*	*	.0383 (0.7974)	.0514 (7.5912)	.0189 (0.7402)	-.0095 (0.9418)	.0449 (3.8745)	.1105 (3.3005)
MARRIAGE DURATION (MARDUR)	-.7809 (8.1942)	-.4085 (7.4249)	.0117 (1.1157)	*	-.3492 (12.7396)	-.3781 (6.5346)	-.0389 (3.5728)	.0333 (1.0111)
MARDURS0	.1232 (3.6048)	.0317 (3.7822)	*	*	*	.0252 (3.2365)	*	*
MARDUR3	-.0080 (2.3577)	-.0010 (2.8181)	*	*	*	-.0008 (2.4958)	*	*
EDUCATION	-.2258 (4.4352)	.0466 (1.1740)	.0103 (0.9060)	.0006 (0.0462)	-.2277 (1.7054)	.0431 (4.3535)	.0153 (1.3210)	.0003 (0.0214)
EDUCATIONSO	.0139 (5.5943)	-.0014 (0.8206)	*	*	.0147 (2.5553)	*	*	*
INCOME	.1435 (2.3810)	.1137 (10.8847)	.0280 (2.6425)	.0314 (0.8378)	.0678 (4.5378)	.0424 (3.4567)	.0175 (5.2654)	-.0176 (0.5896)
INCOMESO	.0239 (1.5167)	*	*	.0129 (1.9565)	.0012 (1.1168)	.0009 (1.0630)	*	.0031 (1.6745)
INCOME3	-.0028 (2.8193)	*	*	-.0010 (2.2998)	-.0001 (3.1669)	-.00004 (2.6923)	*	-.00005 (1.7735)
OTHER INCOME	-.0332 (1.9649)	-.0256 (3.0925)	-.0469 (4.9673)	-.0382 (6.0193)	-.0148 (2.4366)	-.0297 (10.8123)	-.0225 (7.7230)	-.0088 (3.6923)
OTHER INCOMESO	.0064 (2.7707)	.0009 (1.5453)	.0018 (3.2262)	*	.0005 (3.2713)	.0007 (6.6206)	.0004 (3.8674)	*
OTHER INCOME3	-.0028 (3.0435)	-.00001 (1.0825)	-.00002 (2.4282)	*	*	.0000 (4.5857)	.0000 (2.2628)	*
<u>WORK STATUS</u>	.4846 (7.3398)	.4240 (6.9990)	.1379 (1.9061)	-.3406 (3.0577)	.7906 (8.0962)	.6744 (9.0685)	.2040 (2.4241)	-.2437 (1.7262)
<u>PLACE OF RESIDENCE</u>	.0970 (1.1997)	-.0258 (0.3428)	.0003 (0.0036)	-.1715 (1.4719)	-.1219 (1.6737)	-.1850 (4.1035)	-.1448 (0.7117)	.0297 (0.3065)
<u>RELIGION</u>								
CATHOLIC	*	-.1318 (2.3690)	-.2969 (3.6760)	.0607 (0.6008)	-.1372 (1.7027)	-.0795 (1.4704)	.0058 (0.0809)	-.0956 (0.7870)
NO RELIGION	*	-.0130 (0.1203)	.2297 (1.8459)	.3168 (1.6423)	.0805 (0.4853)	.2125 (2.5560)	.2373 (2.2188)	.2621 (1.4528)
RELIGION:OTHER	*	.0592 (0.6728)	-.3657 (2.5867)	.0643 (0.4115)	-.0078 (0.0311)	-.0547 (0.4317)	-.1107 (0.7117)	-.1076 (0.4187)
<u>ETHNICITY</u>								
FRENCH	*	*	*	-.0587 (0.3592)	*	.1275 (1.2842)	*	-.6442 (1.7842)
OTHER:EUROPEAN	*	*	*	-.2255 (2.1094)	*	.1009 (1.4350)	*	-.2470 (1.3658)
OTHER	*	*	*	-.0783 (0.5156)	*	-.1827 (1.9471)	*	-.4731 (2.1625)
<u>PLACE OF BIRTH</u>	*	*	-.1379 (1.7266)	*	*	-.1839 (2.4750)	-.1069 (1.3168)	*
<u>MOTHER TONGUE</u>								
FRENCH	.0407 (0.3799)	*	.1252 (0.9343)	*	.1044 (0.6715)	-.3756 (2.8311)	-.0667 (0.5045)	.6423 (1.8235)
OTHER	-.1624 (2.0409)	*	.2660 (2.8457)	*	-.1797 (1.3895)	.0445 (0.4795)	-.2059 (1.9367)	.0460 (0.2418)
SAMPLE SIZE	2326	4662	4410	2137	1539	5294	4581	2039

Notes: See notes at the bottom of Table 4B.

TABLE 4B. LOGIT REGRESION COEFFICIENTS FOR THE SELECTED EXPLANATORY VARIABLES, QUEBEC

Independent Variables	1971				1981			
	15-24	25-34	35-44	45-49	15-24	25-34	35-44	45-49
AGE AT MARRIAGE	*	-.0010 (0.788)	.0611 (4.6134)	.1197 (3.6489)	*	-.0195 (1.7404)	.0978 (7.1932)	.0288 (0.7284)
MARRIAGE DURATION (MARDUR)	-.3254 (13.1301)	-.3915 (6.4766)	-.0347 (2.8269)	.0497 (1.5588)	-.6407 (7.2404)	-.3797 (5.6714)	.1502 (2.2401)	-.1408 (2.1124)
MARDURSQ	*	.0267 (2.9848)	*	*	.0441 (3.4778)	.0280 (2.9952)	-.0132 (2.6583)	.0019 (1.5591)
MARDUR3	*	-.0007 (1.8333)	*	*	*	-.0009 (2.2230)	.0003 (2.8346)	*
EDUCATION	.0102 (0.6907)	-.0128 (1.2456)	-.0056 (0.4232)	-.0283 (1.5129)	.0503 (2.0726)	-.1141 (1.9396)	-.0073 (0.6271)	.2470 (2.4329)
EDUCATIONSQ	*	*	*	*	*	.0052 (1.8773)	*	-.0101 (2.0187)
INCOME	.4240 (4.6096)	.1805 (5.6644)	.0440 (3.0456)	.0244 (1.2197)	.0420 (4.6689)	.0275 (7.4002)	.0104 (0.9668)	.0134 (1.8724)
INCOMESQ	-.0743 (2.5205)	-.0108 (2.9579)	*	*	*	*	.0009 (1.5118)	*
INCOME3	.0043 (1.7544)	*	*	*	*	*	-.0002 (2.0677)	*
OTHER INCOME	-.0045 (0.4371)	-.0397 (3.5368)	-.0746 (6.2481)	-.0352 (2.8909)	-.0063 (1.5117)	-.0257 (7.2657)	-.0144 (5.0406)	-.0132 (3.1242)
OTHER INCOMESQ	*	.0023 (2.2911)	.0031 (4.3147)	.0002 (0.4068)	*	.0006 (4.8887)	.0001 (2.3399)	.0001 (1.6648)
OTHER INCOME3	*	-.00003 (1.5497)	-.00003 (3.1042)	*	*	.0000 (3.3138)	*	*
<u>WORK STATUS</u>	.3605 (4.3125)	.4486 (6.0877)	.1726 (2.0043)	.2391 (2.1092)	.7605 (7.8491)	.5501 (8.0313)	.2462 (2.7366)	.0518 (0.3818)
<u>PLACE OF RESIDENCE</u>	-.0875 (0.8777)	-.0607 (0.7117)	-.0173 (0.1709)	-.1196 (0.9144)	-.0887 (1.0746)	-.1660 (3.1712)	.0047 (0.0694)	.0507 (0.4491)
<u>RELIGION</u>								
CATHOLIC	-.0157 (0.1076)	-.2045 (2.0331)	-.3060 (2.7584)	.2409 (1.1500)	.3269 (1.4655)	-.0051 (0.0424)	-.1606 (0.9993)	.2872 (1.1236)
NO RELIGION	.3733 (1.1934)	-.0863 (0.3856)	.2178 (0.7556)	.3861 (0.8701)	.2040 (0.3914)	-.0868 (0.4303)	-.2495 (0.9250)	.0019 (0.0032)
RELIGION:OTHER	-.4707 (1.7317)	.0723 (0.4494)	-.1424 (0.7145)	.3788 (1.3379)	.3216 (0.7896)	.3173 (1.5087)	-.2961 (1.1280)	-.1068 (0.2575)
<u>ETHNICITY</u>								
FRENCH	.0640 (0.4706)	*	*	*	.4080 (1.7573)	-.1835 (1.8868)	*	*
OTHER:EUROPEAN	.2280 (1.0874)	*	*	*	.6803 (1.3951)	-.0326 (0.1967)	*	*
OTHER	.3226 (1.3871)	*	*	*	.2834 (0.7829)	-.3249 (1.6900)	*	*
PLACE OF BIRTH	-.2851 (1.7435)	-.2091 (2.1388)	-.2027 (1.8295)	*	*	-.3461 (2.4139)	*	.3302 (1.8753)

Continued...

TABLE 4B. LOGIT REGRESSION COEFFICIENTS FOR THE
SELECTED EXPLANATORY VARIABLES, QUEBEC (continued)

Independent Variables	1971				1981			
	15-24	25-34	35-44	45-49	15-24	25-34	35-44	45-49
<u>MOTHER TONGUE</u>								
FRENCH	*	*	*	-.2931 (1.7523)	-.4298 (1.6442)	*	.0898 (0.6637)	*
OTHER	*	*	*	-.4819 (2.0463)	-.9812 (2.0313)	*	-.4835 (2.2571)	*
SAMPLE SIZE	1399	3621	3219	1542	1097	3981	3431	1480

Notes:

1. The dependent variable 'child status' is coded 1 if the number of children ever born equaled zero and 0 otherwise.
2. The figures in the parentheses refers to absolute value of asymptotic t-statistic for each coefficient and the critical values for 5 and 10 percent confidence levels are 1.960 and 1.645 respectively.
3. The reference categories are: Work Status (Not in Labour force), Place of Residence (Urban, 1971 and in CMA, 1981), Religion (Protestant), Ethnicity (British), Place of birth (Native born), and Mother tongue (English).
4. Income refers to own income obtained by adding INCWAGES and INCSELF for 1971, and TOTINC in 1981.
5. Other Income refers to income obtained from other sources: USFAMINC - (INCSELF+INCWAGES) in 1971 and CFINC - TOTINC in 1981.

childless by 78 per cent and 33 per cent for the 15-24 age group, and 41 per cent and 39 per cent for the 25-34 age group in Ontario and Quebec, respectively, in 1971. Though one can show statistics on out-of-wedlock births, the majority of births are still taking place within marriage. As demographic variables, age at marriage and marriage duration have direct control on the exposure time, and thus waiting time, for pregnancy. Our results, in this regard, confirm the earlier findings of Grindstaff and colleagues, and Tomes, at the national level. Availability of more effective contraceptive methods allows one to postpone childbearing and thus reduce the chance of unwanted and unplanned pregnancies within or outside of marriage. Unfortunately, census data do not allow us to interpret childlessness within marriage duration by controlling for contraceptive use and other related behavioural factors.

Turning to the achieved characteristics, we introduced education as a continuous variable into the final model, along with square and cube terms to account for any nonlinear relationship. This variable was created from the EDUCAT variable in the individual file of census 1971; and for 1981, we created a variable from the three variables, HLOS, HGRAD and PSUV, in

the individual file. Education, in general, is found to be significant for younger-age cohorts, and the effect is negative in Ontario and positive in Québec. Whenever the square terms of education are significant, they show a change of sign for the effect, indicating the presence of a nonlinear relationship between education and childlessness. Surprisingly, education is not significant for any age group in Québec in 1971, and by 1981 education becomes important for all but one of the age groups (35-44). In 1981, education has a positive effect for the 15-24 cohort and a negative effect for the 25-34 cohort in Québec, compared to a positive effect throughout in Ontario, except for the 15-24 age cohort. Unfortunately, census data do not allow us to investigate this relationship further in Ontario, but one guess may be that there will be an increase in teenage pregnancies. In a recent article, Bloom and Trussel, using 1980 Current Population Survey data, found that education was positively associated with childlessness, reaching strikingly high levels among American women in recent cohorts who had more than high-school education (Bloom and Trussel, 1984). It has been generally observed that young Canadian women are spending more years in university compared to their older sisters. Turning to Québec's case, education is least significant in 1971 and barely significant for the 15-24 and 25-34 age groups in 1981. It may be an indication of the Catholic spirit in education that differentiates Québec from Ontario.

The other important achieved characteristic is income. In our study, we split the family income into personal income obtained from wages and self employment and other income, presumed to represent the spouse's earnings. As pointed out by earlier researchers, the wife's income is expected to have a positive effect and other income is expected to have a negative effect on childlessness. Our results confirm this thesis for both the provinces, at both points of time. Many of the square and cube terms of income, and other income, are found to be significant for various age groups. Particularly, other income demonstrates a highly nonlinear relationship by change in sign. Though the sign of the effect is negative, other income is not significant for the youngest cohort of Québec women in 1971. As expected, personal income is not important for older cohorts compared to the effect of other income in both provinces, at both points of time.

Work status is another important variable often found to be associated with childlessness. The work status variable has been dichotomized with the value zero for not being in the labour force and the value one for being active in the labour force. As the table indicates, the chances of being childless are as high as 79 per cent for the 15-24 age group who are in the labour force, compared to the women who are not in the labour force in Ontario in 1981. For

the same group, the chances are 76 per cent higher in Quebec. The consistently positive effect clearly signals that active participation in the labour force is associated with childlessness. However, one is cautioned about the causation which the author does not attribute.

It has been hypothesized that rural women are less likely to remain childless compared to their urban counterparts. A recent study by the author of age of the woman at her first birth shows that rural women in Canada tend to have their first baby earlier than urban women (Rao and Balakrishnan, 1986). In our analysis, we dichotomized the place of residence variable with the value zero for being in an urban area and one for otherwise in 1971, and in 1981, we coded zero for being in a CMA and one for otherwise. The results indicate that the probability of being childless is as low as 17 per cent for rural Quebec women in the age group 25-34 in 1981 compared to the reference group. In Ontario the same age group has about 18 per cent lower probability of childlessness. Place of residence is not very significant in 1971 in both the provinces, but it becomes significant for some age cohorts in 1981. Since we have not used an identical definition at both points of time, it is difficult to interpret these trends.

Religion was hypothesized to be an important predictor of childlessness. In particular, we expect fewer Catholic childless women than we do in other religious groups. Religion is introduced to the model in terms of three dummy variables, representing Catholic, no religion and other religious groups, with Protestant as reference. The analyses show that Catholic women in the age group 35-44 have a 30 percent lower chance of remaining childless compared to the reference group, in both provinces in 1971. Women with no religious affiliation are more likely to be childless, and the chances for this group are as high as 32 per cent for the age group 45-49 in Ontario in 1971. Quebec differs from Ontario in this respect, as no religion shows an insignificant effect for all age cohorts at both points of time. Religion as such is not an important associate of childlessness in Quebec in 1981, whereas some of the effects are significant in Ontario. The religious denominations in censuses are so vague that they are devoid of any analytical sharpness. For example, in Quebec the majority declare themselves as Catholics, and the problem is that the deeply rooted meaningful elements of religion escape the enumerator. In recent studies, religiosity in terms of church attendance is found to be a better indicator of one's religious consciousness. The census data do not have such information, and so we are left with religion, a more broad-based variable. Analyzing 1984 Canadian Fertility Survey data, Balakrishnan and colleagues found that the overall nonuse of contraception among Catholics outside Quebec was higher when compared to nonuse of contraception among Catholics in Quebec. In

this connection, Balakrishnan and colleagues assert that Quebec is "a traditionally conservative society, under strong church influence with regard to reproductive and contraceptive behaviour, has transformed itself into a society in which fertility levels have reached unprecedented lows" (Balakrishnan *et al.*, 1985:213).

Turning to the ascribed characteristics, we considered ethnicity, place of birth and mother tongue. The effect of ethnicity is insignificant for all cohorts in Quebec in 1971. But by 1981, the youngest French ethnic group had 40 per cent higher probability of remaining childless compared to the reference category. Other older European women (45-49 age group) in Ontario had a 22 per cent lower probability of being childless in 1971. Ontario's French ethnic group had lower probabilities in contrast with higher probabilities in Quebec for the same ethnic group in 1981.

In general, foreign-born women are less likely to be childless compared to native-born women in both provinces, except in the 45-49 age group in Quebec. Quebec women with French or other mother tongue have lower probabilities compared to English mother tongue women in Quebec. French mother tongue women in their early thirties (25-34) are less likely to be childless in Ontario in 1981.

Cohort Comparisons

The hypothetical age cohorts formed using 1971 and 1981 census data are not strictly comparable as cohorts, but one can observe some cohort trends in the absence of other relevant data. Since we have controlled for the year of immigration for 1981, we are expected to have the same group of women at both points of time. The only disturbing factor for cohort comparisons come from mortality and emigration. Of the two disturbing factors, mortality's contribution can be safely ignored as our sample consists of ever married women in the age range 15 to 49, wherein mortality effect is considerably low. Inter-provincial migration may be a problem but its magnitude may not substantially effect the final conclusions.

Given these limitations for this type of analysis, we formed two broad ten-year age cohorts. These cohorts are the 15-24 and 25-34 ages in 1971, corresponding to the 25-34 and 35-44 age groups in 1981. Tables 4A and 4B display the results of multivariate analysis of these cohorts for 1971 and 1981. In both the provinces, marriage duration is an important correlate of childlessness. As the cohorts move through the decade, the negative effect of marriage duration persists and is significant. One general observation from the

table is that age at marriage and marriage duration shift their significance as the cohorts pass through the decade. The nonlinear relationship between marriage duration and childlessness persists for the 15-24 cohort of Ontario and the 25-34 cohort of Quebec from 1971 to 1981. In Quebec, education is not significant for the youngest cohort (15-24) in 1971, but it becomes significant as the cohort reaches 1981. Income becomes more effective for the 15-24 cohort in Quebec, but this reduces over the decade as the cohort reaches late twenties. Active labour force participation becomes very strong for the 15-24 cohort in both the provinces by 1981. This may be an indication that active work participation in the prime reproductive ages (25-34) increases the chances of permanent childlessness, either by choice or by chance. In Ontario, education was found to be an important variable for a child-free life style for the 15-24 cohort in 1971, and its influence is reversed as the women reach 1981. Surprisingly, education is insignificant for all age cohorts of Quebec ever married-women in 1971. According to the 1981 Canadian census, about 74 per cent of ever-married women in Quebec of age 15 and above had grade 13 or less education compared to 66 per cent of Ontario and 67 per cent in Canada as a whole (Statistics Canada, 1983a). Is this an indication that Ontario women are spending more years in educational activities and career-oriented plans than Quebec women? We feel that the Catholic spirit involved in the education system in Quebec during the 1970s may be clouding its effect on family, fertility and childless behaviour, and thus Quebec differs from Ontario.

In summary, our analysis of the 1971 and 1981 census data pertaining to Ontario and Quebec indicates an increase in the proportion of ever-married childless women. Increasing marital dissolution and the tendency to postpone marriage or remain single might be contributing to the overall childless pattern in Canada. Our analysis indicates that the basic trends among ever-married women, and thus the level of childlessness, are likely to be an underestimate of their actual incidence, since we have overlooked the never married group. The empirical findings of our study yield a number of statistically significant effects, and these allow us to identify the typical characteristics of ever-married childless women in Ontario and Quebec. In Ontario, a childless woman is likely to marry late, be married for a relatively few years, have a high personal income, have a low other income, be working or actively looking for work, be residing in an urban area, have no religious affiliation or be Protestant. In Quebec, childlessness is associated with the following characteristics: a native-born woman, high age at marriage, fewer years of marital duration, relatively higher education (1981), high personal income, low other income, in the labour force, residing in an urban area, non-Catholic, and English as

a mother tongue. One is cautioned about the cross-sectional nature of period data and the absence of important personal and behavioural factors, which no doubt influence the decision to have or not to have a child. As pointed out by one of the reviewers, statistical significance is an indication of mathematical association and not a proof for causal linkage. There is a need to consider the husband's characteristics with the wife's in order to understand the childless behaviour of the couple. The recent Canadian Fertility Survey carried out by Balakrishnan and colleagues contains a wealth of information on many issues relating to childlessness: work histories — including husband's characteristics; attitudinal questions about abortion, having children, and the importance of marriage; current contraceptive use; and birth histories along with the expectations for future fertility. The author is currently working on the covariates of a woman's age at first birth, childlessness, marriage dissolution, and the lower fertility levels in recent decades, using data from the 1984 Canadian Fertility Survey. It is hoped that the results of this thesis will enhance our understanding of this important phenomenon in Canadian society.

Acknowledgments

The author wishes to thank Professors T.R. Balakrishnan, Carl Grindstaff and Roderic Beaujot; two anonymous reviewers; and the editor for their helpful comments on an earlier version of this paper.

References

- Amemiya, T. 1981. Qualitative response models: a survey. *Journal of Economic Literature* 19:1483-1536.
- Balakrishnan, T.R., G.E. Ebanks and C.F. Grindstaff. 1979. Patterns of Fertility in Canada, 1971. A 1971 Census of Canada monograph. Ottawa: Statistics Canada.
- _____, E. Lapierre-Adamcyk and K.J. Krótki. 1985. Contraceptive use in Canada, 1984. *Family Planning Perspectives* 17:209-215.
- _____, K.V. Rao, E. Lapierre-Adamcyk and K.J. Krótki. 1987. A Hazard model analysis of the covariates of marriage dissolution in Canada. *Demography* 24:395-406.

- Bloom, D.E. 1982a. What is happening to the age at first birth in the United States? A study of recent cohorts. *Demography* 19:351-370.
- . 1982b. Age patterns of women at first birth. *Genus* 38:101-128.
- , and J. Trussell. 1984. What are the determinants of delayed childbearing and permanent childlessness in the United States? *Demography* 21:591-612.
- Bogue, J.D. 1969. *Principles of Demography*. New York: John Wiley and Sons.
- Bumpass, L. 1973. Is low fertility here to stay? *Family Planning Perspectives* 5:67-69.
- Grindstaff, C.F., T.R. Balakrishnan and G.E. Ebanks. 1981. Sociodemographic correlates of childlessness: An Analysis of 1971 Canadian Census. *Canadian Journal of Sociology* 6:337-351.
- Kiser, C.V. 1939. Voluntary and involuntary aspects of childlessness. *Milbank Memorial Fund Quarterly* 17:50-68.
- Menken, J. 1985. Age and fertility: How late can you wait? *Demography* 22:459-483.
- Nerlove, M. and S.J. Press. 1973. Univariate and multivariate log-linear logistic models. Report No. 1306, prepared for the Economic Development Administration and the National Institutes of Health. Santa Monica: Rand.
- Pol, L.G. 1983. Childlessness: A panel study of expressed intentions and reported fertility. *Social Biology* 30:318-327.
- Popenoe, P. 1943. Childlessness: Voluntary or involuntary. *J. Hered* 34:83-84.
- Poston, D.L., Jr. 1974. Income and childlessness in the United States. Is the relationship always inverse? *Social Biology* 21:212-224.
- , and E. Gotard. 1977. Trends in childlessness in the United States, 1910-1975. *Social Biology* 24:212-224.
- Rao, K.V. and T.R. Balakrishnan. 1986. Covariates of age at first birth in Canada: A Hazards Model Analysis. Paper presented at the Canadian Population Society meetings. Winnipeg, Manitoba.
- Romaniuc, A. 1984. Fertility in Canada: From Baby-Boom to Baby Bust. Current demographic analysis. Catalogue 91-524 Occasional. Ottawa: Statistics Canada.
- Schapiro, B. 1980. Predicting the course of voluntary childlessness in the 21st century. *Journal of Clinical Child Psychology* 9:155-159.
- Statistics Canada. 1983a. 1981 Census of Canada. Population: Age, Sex and Marital Status. Catalogue 92-901. Ottawa.
- . 1983b. 1981 Census of Canada. Population: Mother Tongue. Catalogue 92-902. Ottawa.
- Tomes, N. 1985. Childlessness in Canada 1971: a further analysis. *Canadian Journal of Sociology* 10:37-68.

- Veevers, J.E. 1973. Voluntary childless wives: An exploratory study. *Sociology and Social Research* 57:356-366.
- . 1979. Voluntary childlessness: A review of issues and evidence. *Marriage and Family Review* 2(2):1-26.
- . 1980. *Childless by choice*. Toronto: Butterworths.
- Whelpton, P.K. and C.V. Kiser (eds.). 1950. *Social and psychological factors affecting fertility*. New York: Milbank Memorial Fund.
- Wolowyna, J.E. 1977. Income and childlessness in Canada: a further examination. *Social Biology* 24:326-333.

Received September, 1985; revised March, 1986