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Age at First Intercourse in Canada: Some Recent Findings

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Abstract

Age at first intercourse in Canada is investigated using national data from the 1990 Health Promotion Survey. The onset of sexual intercourse is examined at ages 15, 16 and less than 20 by current age, regional residence, gender and language spoken at home. A multivariate logistic regression analysis shows that gender differences in the onset of sexual intercourse have eroded over time in Canada. Little support was found for the hypotheses that differences in the onset of coitus in adolescence are reflected along regional lines or by sub-cultural groups.

Résumé

Les données nationales tirées de l'Enquête promotion santé de 1990 ont servi à déterminer l'âge auquel survient le premier rapport sexuel. Le commencement des rapports est examiné pour les 15, 16 et moins de 20 ans, d'après l'âge actuel, le lieu de résidence régional, le sexe et la langue d'usage. Une analyse multivariée de régression logistique montre que, en ce qui concerne le sujet à l'étude, les différences de sexe se sont estompées au cours du temps au Canada. On ne parvient pas à justifier les hypothèses soutenant que les différences sont décelables selon les régions ou les groupes sous-culturels.

Key Words: Age at first intercourse, intermediate fertility variables, egalitarian sex roles, logistic regression, odds, censoring

Introduction

Age at first intercourse is a significant life event and can be interpreted from a variety of perspectives including demographic, biological, sociological, psychological, anthropological, educational, medical, legal and moralistic. Despite the significance of this event, there is a lack of detailed systematic survey data collected on Canadian teenage sexuality. However in recent years, the AIDS problem has prompted the necessity of gathering data on sexuality, among Canadian adolescents who may not have internalized the risk of contracting HIV (King et al., 1988). This deficiency at the national

level has been reflected in cross-national studies that have included Canada as a country for comparison (e.g., Jones et al., 1986; United Nations, 1988; Singh and Wulf ,1990). For example, in a major study of teenage pregnancy in industrialized nations conducted in the 1980s, Jones et al. (1986) resort to a 1976 national survey on abortion to speculate that Canadian teenagers aged 15-17 may have lower levels of sexual activity than their American counterparts. Later, citing the 1984 Canadian Fertility Survey data on contraceptive use that had included women 18-19, Jones et al. (1986), suggest that Canadian-United States differences in sexual activity rates are small or non-existent among older teenagers. Similarly, Canadian estimates presented in a United Nations (1988) report on adolescent reproduction in developed nations show major gaps in knowledge concerning the initiation of sexual activity among Canadian adolescents. In fact, it cannot be surmised from the available data reported in previous research whether the rate of initiation of sexual intercourse for Canadians under 20 has gone up over time, or even if older teens (ages 18 and 19) have increasing rates over time. All studies in Canada with the exception of a 1976 study reported in the United Nations publication (1988) are localized surveys, rather than at the national level.

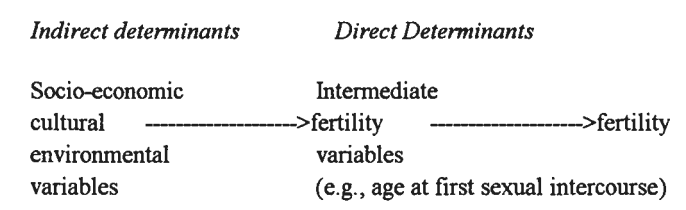
In this article, demographic and sociological interpretations are offered with regard to the relevance of region, gender and language on age at first intercourse in Canada. The analysis relies on data from the 1990 Health Promotion Survey. This survey, based on a large national probability sample, permits for the first time, a systematic analysis on the onset of sexual activity among different generations of Canadians by using retrospective reporting of the initiation of sexual activity. However, due to the cross-sectional nature of the majority of the survey questions, only a few socio-demographic predictors can be examined in temporal order. Thus, variables in the survey such as income and occupation that were measured at the current survey date may not be appropriate for predicting events that happened earlier.

A Demographic Perspective

Age at first intercourse can be viewed as an intermediate determinant of differential fertility in society. Figure 1 shows briefly how intermediate variables such as age at first intercourse affect fertility in the framework of Davis and Blake (1956) and more recently developed by Bongaarts (1978). Intermediate variables are influenced by a host of biological, social and cultural variables. Age at first intercourse interacts with other intermediate variables such as fecundity, exposure to conception, and pregnancy

resolution to determine fertility. For example, a higher age at first intercourse in a society, all other things equal, delays the average exposure to conception, while, a younger age at first intercourse would have the opposite effect.

FIGURE 1.



From Bongaarts (1978:106)

This demographic model can be applied to study illegitimate fertility and adolescent fertility (Freshnock and Cuthright, 1979; United Nations, 1988). Age of first intercourse becomes particularly salient when we restrict the above model to teenage fertility, defined as fertility occurring to women under the age of 20. Treated as an event in the young adult life course, age at first intercourse can be investigated in a manner similar to other early demographic events affecting people's lives later on such as the age at first marriage and the age at birth of the first child.

Sociological Explanations

Sociologists have generated a profusion of research into the incidence and prevalence of adolescent sexual activity as linked to the attitudes and behaviours of individuals.[1] Clayton and Bokemeier (1980) have reviewed the epidemiology and etiology of premarital sexual attitudes and behaviours in the United States. The prevalence and incidence of premarital and teenage sexual activity has been well documented over the last 40 years. Some of the important findings from decades of American research reported by Chillman (1978) are the substantial rise in premarital intercourse found in surveys of adolescents, and a noticeable gap between males and females, with males reporting earlier onset of sexual intercourse than females, particularly at younger teen ages. Differences by degree of religiosity, race, socio-economic status, region and education have also been reported (Chillman, 1978; Voydanoff and Donelly, 1990). Reviews of the literature

have also shown family context variables such as family structure and the qualities and/or characteristics of the parent-child relationship to be salient predictors of teenage sexuality (Voydanoff and Donnelly 1990; Larson, Goltz and Hobart, 1994).

Key to this current investigation are macro level explanations of the structural characteristics that are thought to have changed the acceptance of early initiation of sexual activity or fostered opportunities for the event to occur. Some of these structural explanations stated by Beeghley and Sellers (1986) that may be relevant to the Canadian situation include: 1) *Sexual maturity gap*—the gap between the average age at menarche for females and a later average age at marriage has produced more time for premarital sexual intercourse to occur ; 2) *Sexual pervasiveness*—the pervasiveness of sex in the mass media and other sources socializes the young to believe that premarital sex is the norm rather than the exception and numerous examples in the media simulate how to conduct the act of sexual intercourse; 3) *Social autonomy*—the separation of work, home and school environments permits more opportunity for sexual activity to occur for youth in unsupervised locations and time; 4) *Sexual safety*—increasing access to contraception, and medical advances in regard to treating venereal diseases makes people perceive premarital sex as less risky; 5) *Egalitarian sex roles*—with the erosion of the double standard in sex roles, women are no longer dictated to follow traditional sexual roles, and that sex be confided solely within marriage; 6) *Social acceptance of premarital sex*—social norms promoting sexual abstinence have declined primarily through changing attitudes regarding sexuality and marriage.

Canadian teenagers have in recent years been exposed to many of the same social, biological, medical, and legal changes influencing early sexual activity in their American youth counterparts. Changes in family structure, largely as a consequence of increased divorce rates, and the increasing participation of mothers in full-time work, has contributed to increased opportunities for adolescents to participate in unsupervised activities, including sexual intercourse. Many of these have likely affected the timing of first sexual intercourse. Also, the declining age of menarche over recent decades and the tendency for women to marry at later ages has widened the exposure to the risk of early sexual involvement and even premarital conceptions. Social norms regarding the acceptance of premarital sex have changed and have also promoted the occurrence of coitus to take place earlier in one's life course.

Teenagers are also being exposed to media messages and images that show premarital sexual activity more explicitly and in a more favorable light than

is the case for previous generations. A recent estimate of a typical teenager watching five hours of television a day suggests that he/she may see nearly 14,000 sexual encounters in a year (Gibbs, 1993).[2] Moreover, the reconceptualization of female sexuality in contemporary society, along with the redefinition of sexual relationships has eroded the old "double standard" that sexual activity is always initiated by males. Under these conditions, it is reasonable to assume that women are also taking leading roles in matters of sexuality. Among Canadian college students there has been, indeed, an erosion of the "double standard" regarding premarital sexual activity (Hobart, 1972, 1979, 1984, 1990). Hobart's most recent research using 1988 data, indicates that female students are almost as likely as male students to report the initiation of sexual intercourse (Larson, Goltz and Hobart, 1994).

Medical advances in the area of contraception and treatment of sexually transmitted diseases such as gonorrhea and syphilis, may render the perception of sexual activity and its possible consequences among teenagers as being unrealistically safe from the point of view of the risk of early pregnancy, disease or even legal censure. In reality, the threat of AIDS has not diminished and the transmission of other sexually transmitted diseases such as chlamydia and gonorrhea is quite high for young Canadians (Gully and Rwetisba 1991a, 1991b). Unwanted teenage pregnancy remains a concern. In fact, 90% of Canadians believe that it is a serious problem (Gallup, 1992). The extent to which teenagers view these medical and social developments, and calculate their risk, has been studied in the United States in the context of other risk-taking behaviours (Mensch and Kandel, 1992). As in the United States, in Canadian survey findings of youth show a direct association between risk-taking behaviour such as consumption of drugs, alcohol and cigarettes, with the frequency of sexual intercourse (King et al., 1988).

The Onset of Adolescent Sexual Intercourse in Canada

Recently, a few surveys have been conducted in Canada which provide estimates of the levels of teenage sexual activity. Gallup (1988) presented national survey data which show considerable generational differences in the percentage reporting having had first sexual intercourse before age 20. In the 1988 Gallup survey, 94% of respondents aged 18-24 years old reported having had sexual intercourse before age 20 while 24% of respondents aged 65 and over reported having had first sexual intercourse before reaching their twentieth birthday. Differences in the percentage reporting sexual intercourse by age 20 were noted by gender in the Gallup survey, with 66% of males and 56% of females, respectively, reporting coitus by age 20

(Gallup, 1988).

King et al. (1988), using data from the Canada Youth and AIDS Survey report levels of sexual activity among Canadian teenagers from samples of junior high, high school and college students and dropouts. Their study shows that the percentage reporting sexual intercourse increases by age and varies by whether the teenagers were currently enrolled in school or had dropped out. For respondents at age 16 in grade 11, 40% reported having sexual intercourse while 75% of dropouts aged 16 reported coition. At age 19, 70% of respondents in college and 93% of the dropout sample reported having had sexual intercourse. King and associates (1988) found differences by gender in reporting, with males more likely to report having had sexual intercourse in grade 9 (31%) compared to females (21%). However, by grade 11 this gender difference had decreased, with 49% of males and 46% of females reporting having had coitus. Patterns of sexual activity were found to differ across Canada, with a 20% difference found between the high province/territory (42%) and the low province/territory (22%) for sexual intercourse occurring by Grade 9. At Grade 11, a similar difference was found between the low province/territory (44%) and the high province/territory (65%) in the study. Unfortunately, the authors do not identify the specific provinces or territories in their report.

In a study of contraceptive use among teenage women in Toronto, Montreal and Vancouver, the extent of sexual activity was found to increase from 30% by age 15 to 65% by age 18 (Insight Canada, 1992). Differences by city were noted, with teenage women overall, in Montreal more likely to report having sexual intercourse (45%) than in Toronto (30%) or Vancouver (32%). However, in a nationwide poll of teens aged 12-19 conducted by Decima (1992), females aged 15 and 16 were more likely to report having sexual intercourse (33%) than males (20%) in these same ages (Macleans, 1993). In this Decima poll, of all teens aged 17-19, almost 60% reported having sexual intercourse. Thus, from the available evidence, sexual activity among teenagers in Canada has been shown to increase within the teen years, and differences have been noted by gender and also by geographic locality.

Hypotheses

The emphasis in this study will be to examine a few basic hypotheses concerning the onset of adolescent sexual activity in Canada. It is proposed that the differences in early premarital sexual activity in adolescence are reflected along regional lines, gender and sub-cultural groups.

Unfortunately, as indicated earlier, the available data in the 1990 Health Promotion Survey does not permit investigation by other variables.

Regional Hypothesis

Regions with above average overall teenage fertility are predicted to show both earlier onset of coitus and higher proportions of their populations having sex before age 20. Historically, the Atlantic and Prairie provinces have had higher teenage fertility rates than Ontario, British Columbia, and especially Quebec which has had an extremely low rate of teenage fertility over the last few decades (Odynak, 1994). This hypothesis is based on a presumed linkage between socioeconomic deprivation, early onset of first sexual intercourse and high fertility levels as indicated in the intermediate variables framework. Regional differences in fertility levels with the Atlantic provinces showing above average fertility have been noted by other researchers (Trovato and Halli, 1983). Support for the regional hypothesis would be shown by significant positive effects over time for regions that have been relatively disadvantaged in Canada (e.g., Atlantic region, Yukon and Northwest Territories). Strong positive effects are predicted over time for regions with teenage fertility rates higher than the Canadian average. Strong negative effects are predicted for regions that have always been below the Canadian average rate of teenage fertility.

An alternate explanation is the convergence hypothesis for the onset of sexual activity. In general, this explanation postulates that with modernization, regional differences in social behaviours tend to erode over time to the extent that region of residence, particularly among the youngest age groups, makes little difference on the onset of sexual activity.[3] More specifically, as access to contraception for adolescents improves and sexual education becomes more universal among the provinces, observed patterns of teenage sexual behaviours will generally converge over time.

Sub-Cultural Hypothesis

Subgroup expectations and norms can serve to promote or discourage certain behaviours, such as the probability of initiation of early sexual intercourse (Freshnock and Cutright, 1979). Given Canada's multicultural composition, the extent to which people speak English in the home may be viewed as a measure of assimilation to Anglo-Canadian society. This is a possible predictor of virginity status particularly at the younger teen ages, where among many ethnic subcultures intercourse might be considered as an

activity reserved strictly within marriage. Under this hypothesis we expect that the effects of language of the home will be significant for the French and the other linguistic groups who are assumed to be more traditional in sexual orientations than the reference group, English Canadians. Teens from the French and "other" groups are predicted to be also less likely to report having sexual intercourse at all the teen ages.[4]

Egalitarian Sex Roles Hypothesis

Beeghley and Sellers (1986) theorize that rising premarital sexual activity in the United States is partially attributable to the more egalitarian sex roles that females have adopted over the last few decades. This explanation is evaluated indirectly in this study by examining the ages of onset for intercourse of men and women over time. This approach to testing the egalitarian sex roles hypothesis examines behaviours not attitudes toward the equity and/or fairness of gender relations in the context of the initiation of first sexual intercourse. If the gap between male and female age of onset of sexual intercourse remains the same or widens over time in favour of males, we would infer a maintenance of the "double-standard" regarding male and female sexuality. Under the "double-standard," males would experience sexual intercourse at early ages predating marriage, while females postpone sexual intercourse until marriage, or to ages when the onset is perceived to be socially permissible for females (mid-twenties). This hypothesis predicts gender effects over time, reflecting a wide gap in favour of early males' onset of sexual activity in relation to women. If the double standard has eroded in recent decades, females are expected to currently engage in early sexual activity in an extent similar to males, and the male-female difference in onset of sexual intercourse will reduce in magnitude and significance over time.

Data

The data used in this investigation are from the 1990 Health Promotion Survey (1990 HPS), which was a nationally representative telephone sample survey of 13,792 Canadians aged 15 and over. The 1990 HPS was the second Health Promotion survey conducted in Canada with an emphasis on the attitudes, knowledge and practices of Canadians regarding their health. While the 1990 Health Promotion survey repeated many questions found on the 1985 Health Promotion Survey, new sections were included on men's and women's health in regard to sexual practices. The 1990 HPS is the first survey conducted by the federal government to include a section on sexual

practices among the general Canadian public (Williamson, 1993: 196).

Ages at which the event of initiation of sexual intercourse occurred were classified in the public release of the data set as under 15, 15-16, 17-19 and then by five-year age groups. Therefore, this coding restricts the type of statistical analysis that can be undertaken in this study. The current age of respondents at the time of the survey was classified as 15-16, 17-19 and then in five-year groupings past age 20. One major limitation of the data on the initiation of sexual intercourse classified by current age at the time of the survey is that younger age groups (15-16, 17-19) have not completely passed through their periods of exposure to risk. The result of this censoring effect would be a downward bias of the estimated probability for the event to occur for these ages.[5] In addition, there exists the possibility that those more at risk for earlier sexual initiation among the older age groups (cohorts) were not part of the survey population due to their exclusion as a consequence of premature mortality.[6]

An additional data limitation for this analysis is that for language spoken at home, small sample sizes dictated that French-speaking and other languages (besides English) be combined into one category. The potential danger of pooling these two categories is that it might lead to a situation where two contradictory trends cancel each other out. The ethnic composition of this combined category is 48% French or French Canadian, 21.4% reported as Canadian, and 30.6% of these respondents coded as "other" ethnicities in the 1990 Health Promotion Survey.

Region in the survey is recorded as the current residence of the respondent at the time of the survey and serves as a crude proxy variable for the region where the respondent lived before the age of 20. The problem with this proxy measure is that it may not accurately reflect residence during childhood and youth. Unfortunately, the 1990 HPS does not include respondents from the Yukon or Northwest Territories, where typically, the teenage fertility rates exceed the rates for the provinces.

Methods of Analysis

The 1990 Health Promotion Survey data were weighted to adjust for over and undersampling, non-response, multiple telephone households and to reflect census population projections (Peters, 1993). For this investigation, the data were divided by the average weight of all records to scale down the estimates to reflect the sample size rather than the projected Canadian population.[7] The dependent variables in this analysis are the event of

initiation of sexual intercourse at ages of 15 and less, 16 and less, and below age 20, compared to the non-occurrence of the event of sexual intercourse at the given ages of 15, 16 or less than 20. The dichotomous nature of these dependent variables suggests that linear multivariate analysis may be inappropriate (Swafford, 1980; Aldrich and Nelson, 1984; Cleary and Angel, 1984; Evans, 1988). The analysis consists of a series of logistic regressions for these three separate dependent dichotomous variables.[8]

The logistic regression model can be expressed as:

$$\log\left(\frac{P}{1-P}\right) = \alpha + \Sigma \beta_i * X_i \qquad (1)$$

where P is the probability of event occurrence (in this case initiation of sexual intercourse by age 15, 16, or less than 20), α is the intercept and β_i represents slope coefficients for a set of explanatory variables X_i (in this study gender, current age, region, and language spoken at home). This equation can also be expressed as the predicted probability of the event occurring as a function of the explanatory variables; that is:

$$\text{Prob (sexual intercourse) by age k} = \frac{1}{1 - e^{-(\alpha+\beta_1 X_1 \beta_2 X_2 \beta_i X_i)}} \qquad (2)$$

where e is the base of the natural logarithm, and α , β_i and X_i have been defined in (1).

The parameters are estimated using Maximum Likelihood methods. The logistic regression coefficients are interpreted as a one unit increase in the explanatory variable under consideration as contributing to increase or decrease in the log odds of the dependent variable; the coefficients can be converted from log odds to odds by exponentiating the right side of equation 1 (Swafford, 1980).[9]

All independent or explanatory variables are deviation coded, which means that any category of the explanatory variables reflects its deviations from the overall average of the dependent variable. The log odds of the reference category for each predictor are computed by taking the negative sum of the log odds generated from the regression (Swafford, 1980). Model fitting of

the main effects and any interactions term is assessed by the reduction in error from the baseline Log Likelihood, which is the model containing the intercept only.

Current age group of respondent in this analysis is treated as a proxy for time, whereby, broad current age groups in the survey represent different generations of Canadians that experienced the event being studied sometime in the past. Thus, to examine the incidence of first coitus 35 or more years ago in Canada, we can examine the retrospective reporting of survey respondents aged 55 and over. For coitus occurring at ages 15-16, and under 20, the youngest current age group used was 17-19. When investigating the occurrence of sexual intercourse at ages 17-19, some downward bias on the estimated probability for the event to occur is expected since some of the younger respondents had not finished their period of risk.

TABLE 1. PERCENTAGE AND ESTIMATED CANADIAN POPULATION OVER AGE 15 REPORTING INITIATION OF SEXUAL INTERCOURSE BY AGE 15, AGE 16, AND UNDER AGE 20, AGES 15 AND OVER.

	Percentage Reporting Having Sexual Intercourse	Estimated [a] Population
By age 15	7.8	1,556,007
By age 16	26.7	5,323,206
Under age 20	58.8	11,712,709
Refusal to answer	6.2	1,223,200
Estimated Population [a] Over 15		20,643,379

Source: 1990 Health Promotion Survey

[a] Sample estimates are inflated to the population using projections from census data provided in the weighting in the 1990 HPS.

Results

Table 1 shows the estimated percentages and population over age 15 reporting sexual intercourse by age 15, by age 16, and ages less than 20. As can be seen from Table 1, the event of first coitus is likely not to occur by age

15 (8%), or by age 16 (27%), but more than likely to occur under age 20 (59%). Despite the sensitive nature of the question, only 6% refused to respond. Table 2 shows the multivariate analyses of the event of sexual intercourse occurring by ages 15, 16, and under age 20.

Sexual Intercourse by Ages 15, 16 and Under 20 in Canada Over Time

Generally, the incidence of first coitus occurring at ages under 20 has increased over time in Canada. Changes in the estimated probability of sexual intercourse by current age of respondent are shown in Figure 2. For the most part, monotonic increases are shown for younger generations of Canadians for first sexual intercourse occurring by ages 15, by 16 and under 20. One interesting departure from the monotonic trend exists. While increases are shown for the event to occur by ages 15 and 16 for the current ages of 15-19 and 17-19 respectively, a decrease is shown for the event to occur by age 19 for the current ages 17-19. In the absence of censoring, we could expect a much higher estimated probability for the event to occur under age 20 if past trends did continue for this age group. In other words, the measurement stopped at the survey date but the event may still occur to members of this age group past the survey date. Thus, in Figure 2, an additional segment has been added to the bar representing the event of first sexual intercourse occurring under age 20 for respondents currently aged 17-19 under these two assumptions.[10] Also examined was the distribution of non-response by current age group. Figure 2 shows an increasing trend in non-response by age, where older respondents are more likely to refuse to answer the question on the age they first had sexual intercourse.[11] Older respondents may find the question more sensitive than younger respondents or cannot recall the timing of an event after many years.

Table 2 shows multivariate log-odds by current age groups 15-19, 20-34, 35-44, 45-54, and 55 years and over. In all but three regressions, the addition of the variables region, sex and language spoken at home represented a significant improvement in fit from the baseline model (constant term only). No interactions between region, language and sex were found to be significant and thus, models with these interaction terms are not shown in Table 2 .

The table shows broad changes over current age for the influence of region, sex and language spoken at home on the log-odds of first sexual intercourse occurring at ages under 20. The log-odds for males engaging in sexual intercourse for the first time at the three teen ages considered decrease monotonically with increasing current age. These log-odds from Table 2

Table 2

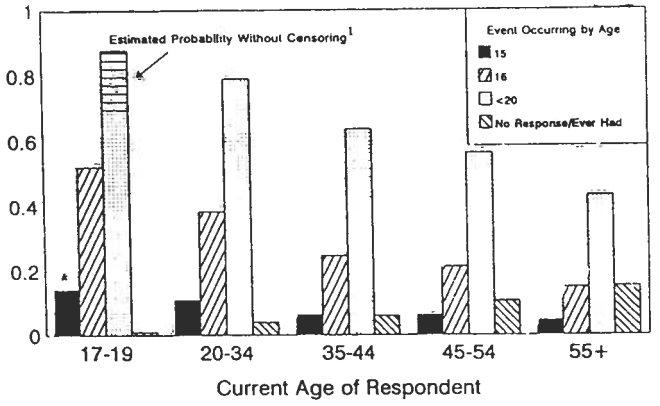
Log-Odds Age at First Intercourse by Current Age group by Sex, Region and Language Spoken at Home

Current Age Group	15-19			20-34			35-44			45-54			55+		
Age of Onset of First Sexual Intercourse	15[a]	16[b]	<20[b]	15	16	<20	15	16	<20	15	16	<20	15	16	<20
Sex															
Male	0.2026*	0.1342	0.1444	0.4777**	0.4297*	0.2741**	0.7201**	0.4688**	0.3711**	1.1121**	0.6239**	0.3673**	1.1448**	0.8721**	0.467**
Region of Residence															
Atlantic	0.1626	-0.1885	-0.0642	-0.0391	-0.0021	0.0988	0.0014	-0.1106	0.0228	0.093	0.0617	0.1254	0.2888	0.4831*	0.4776*
Quebec	0.6328*	0.0431	0.081	0.5236*	0.3059*	0.5821**	0.2966	0.6248*	0.4384*	0.1158	0.2451	0.0067	-0.0011	-0.4033*	-0.3003*
Ontario	-0.5724**	-0.0441	-0.0319	-0.346*	-0.2793*	-0.4441**	-0.3875*	-0.2939*	-0.2389*	0.3826*	-0.0626	0.0092	-0.2953	0.2041*	-0.0783
Prairies	-0.2393*	-0.1653	0.0873	-0.1831	-0.1315	-0.1526	-0.1611	-0.3857*	-0.1938	-0.2296	-0.1549	-0.0307	-0.3478	-0.4914*	-0.2519*
(BC)	0.0165	0.3549	-0.0722	0.0246	0.1071	-0.0642	0.2506	0.1654	-0.0285	-0.1302	-0.0693	-0.1106	0.3554	0.2075	0.1509
Language Spoken at Home															
English	0.0251	-0.1368	-0.1866	0.2357*	0.2045*	0.2897*	0.2193	0.5245**	0.4689**	-0.0074	0.0865	0.1281	-0.1127	-0.2211*	-0.0678
Constant	-1.8123**	0.1481	1.0888**	-2.2501**	-0.5472**	-1.3256**	-2.945**	-1.3936**	-0.4286**	-3.2081**	-1.4391**	-0.2401**	-3.3585**	-1.8299**	-0.1241*
-2 X Log-Likelihood	942**	1026	872	2829**	5376**	4151**	1120**	2645**	3143**	685**	1583**	2168**	931	2135**	3758**
-2 X Baseline Model Log-Likelihood [c]	979	1037	864	2936	5577	4255	1193	2783	3284	771	1684	2233	1054	2400	3933
Number of cases	968	613	613	4356	4356	4356	2528	2528	2528	1400	1400	1400	3067	3067	3067

* Significant at .05 level.
** Significant at .0001 level.
[a] Includes ages 15-19
[b] Includes ages 17-19
[c] Based on model with constant term entered

were transformed into the ratio of odds between males and females and are shown in Figure 3. For older age groups, 45-54 and 55 and over, males were found to be at least nine times more likely than females at these ages to engage in sexual intercourse by age 15, whereas for younger age groups the odds are closer to unity. Likewise, male odds for engaging in sexual intercourse by ages 16 and under age 20 have declined to unity over time.

FIGURE 2. ESTIMATED PROBABILITY OF SEXUAL INTERCOURSE FIRST OCCURRING BY AGES 15, 16 AND UNDER 20, BOTH SEXES BY CURRENT AGE GROUP OF RESPONDENT

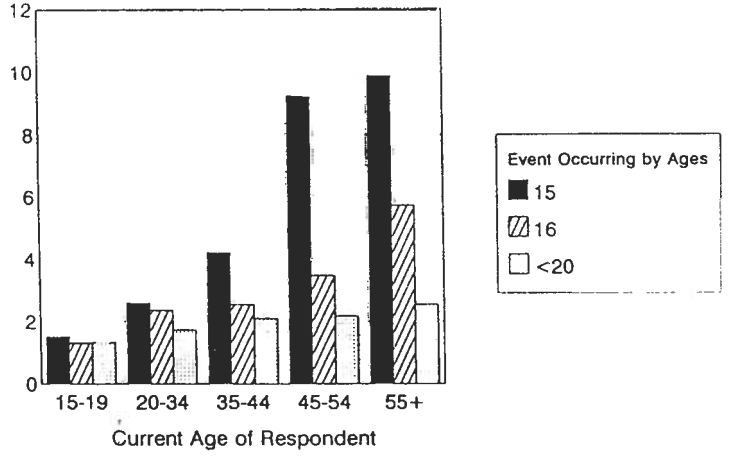


Data analyzed from the 1990 Health Promotion Survey
* Ages 15-19
[1] Censored at the current survey date. Event could still occur for this age group

The decreasing male odds for first sexual intercourse occurring under age 20 over time suggests some support for the egalitarian sex role hypothesis. It would appear that females are now just as likely as males to engage in sexual intercourse by ages 15, 16 and under age 20.

Regional odds of engaging in sexual intercourse show few definite and consistent patterns over the current age of respondent, except for the province of Quebec. There is little to support the hypotheses that regional patterns of the onset of coitus follow regional patterns observed for teenage fertility over time in Canada. Also little support is found for the hypothesis that the regions that are disadvantaged would show higher rates of the onset of first sexual intercourse. There is no clear discernible pattern to suggest that all regions have become similar over time (convergence of regions). In fact, Quebec seems to show patterns over time that contradict the regional hypothesis. For the event of sexual intercourse having occurred by the age of 15, in Quebec a pattern of increasing odds over the current age of respondent is shown. The younger respondents, those 15-19 and 20-34 show positive odds. For the event of sexual intercourse having occurred by the age of 16, increased odds are noted for respondents currently aged 20-34 and 35-44. Respondents, aged 35-44 living in Quebec, are twice as likely than

FIGURE 3. ESTIMATED MALE-FEMALE DIFFERENCES IN ODDS OF SEXUAL INTERCOURSE FIRST OCCURRING BY AGES 15, 16 AND UNDER 20, BY CURRENT AGE GROUP OF RESPONDENT



Data analyzed from the 1990 Health Promotion Survey

average to have had sexual intercourse by age 16. Decreased odds for having sexual intercourse by age 16 were shown for the older age group 55 and over. Even odds are shown for Quebec residents engaging in first sexual intercourse by age 20 and increased odds are shown for Quebec residents for ages 20-34 and 35-44. Once again, there may be a censoring problem with younger respondents aged 15-19, not completing their period of exposure to risk at the current survey date that may deflate the odds.

Estimated log-odds for English-speaking respondents show little support for a sub-cultural hypothesis that would see decreased odds for respondents who spoke French or other languages at home. Increased odds are shown for English-speaking respondents aged 35-44 for the onset of sexual intercourse by ages 16 and 19. At these ages, English-speaking respondents were 2.8 and 2.7 times more likely to have sexual intercourse than "other" languages.

Discussion

This study set out to examine whether there were differences in the age of onset for sexual intercourse in the teen years by current age, region of residence, sex, and language spoken at home. These are the only variables that are suitable in the available data set to study the event age at first sexual intercourse, which for many respondents occurred many years ago. Therefore, the predictors in the analysis had to be ascribed characteristics in order to properly specify temporal order of effects.

Among recent generations, the incidence of sexual intercourse under age 20 has increased in Canada. The age of onset for sexual intercourse in Canada has shifted toward younger teen ages. One important question that arises from these data is whether the lower observed rate in 1990 for first sexual intercourse under age 20 for Canadians aged 17 and 18, is the result of censoring or whether perhaps Canadian teenagers are actually abstaining from sexual intercourse. Comparisons of the Canadian results from the 1990 Health Promotion Survey with 1983 American results reported in Voydanoff and Donnelly (1990) suggest that Canadian teenagers have relatively lower rates of sexual activity.

Little evidence was found in support of the hypothesis that patterns of high sexual activity in a region corresponded to higher patterns of teenage fertility. For example, Quebec has historically shown a pattern of low teenage fertility, but in 1990 showed some increase in adolescent sexual activity, particularly at the younger teen ages. Also, there was no discernible pattern in the odds among the regions to suggest any regional convergence in the onset of sexual intercourse. No support was found for the hypothesis that a relatively disadvantaged region like the Atlantic would show higher rates of sexual activity among adolescents. Moreover, support is found for the hypothesis that language, as a measure of sub-cultural norms, against initiating sexual activity as teenagers, is of any relevance. Once again, an alternative explanation may be that combining French-speaking respondents with respondents speaking other languages may have the unintended result of two different trends canceling each other out.

The most significant finding in this study was the erosion over time (as measured retrospectively by current age in 1990) of male and female differences in the onset of sexual intercourse. Hobart (1972, 1979, 1984) has found a decline of the double standard regarding premarital sexual activity among Canadian college students. As a possible influence in the rise of premarital sexual activity in Canada, the egalitarian sex role hypothesis shows promise and should be pursued in future investigations with more

appropriate data. Surveys of premarital sexual experiences reported in the United States (Hayes, 1983 reported in Voydanoff and Donnelly, 1990) and Latin American countries (Deidre and Wulf, 1991; Population Reports, 1992) show a noticeable gap between males and females in the onset of sexual intercourse under age 20. The reasons for the different results in Canada needs to be explored more systematically and additional explanatory variables are needed such as measures of sexual education, degree of religiosity, and attitudes toward premarital sex.

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Notes

1. Summaries of American research on premarital and adolescent sexuality in the sixties, seventies and eighties can be found in several sources; Cannon and Long (1971), Chillman (1979), Clayton and Bokemeier (1980), Voydanoff and Donnelly (1990).

2. A Time/CNN poll of 500 teenagers aged 13-17.

3. Recent data on regional differences presented by Goyder (1993) suggests that regional patterns in differences observed in various demographic and social phenomena have eroded over time in Canada.

4. Alternatively, although not examined in this investigation, are situations where subgroup cultural norms could foster a pro-natalist mentality where sexual activity at younger ages could be the norm rather than the exception such as the fertility norms expressed among some of Canada's Aboriginal populations (see Trovato, 1987).

5. Williamson (1993) in her analysis of the 1990 Health Promotion Survey data on sexual health and STD prevention, speculates that the lower estimates in the younger current age groups, 15-19, may reflect that this generation has to contend with the possibly fatal consequences of their behaviour, and fewer are engaging in sexual intercourse at all (199).

6. There is potential for a systematic selection bias of older Canadians in the survey that may have reported differently from older Canadians excluded by mortality from participating in the survey. For example, if older Canadians excluded by mortality were more prone to consume alcohol, tobacco and engage in other risk taking behaviours they may have had an earlier onset of sexual intercourse than the survey sample.

7. Weights provided in the survey data set also inflate the sample estimates to calculate population estimates that are based on 1990 population projections. In this analysis, the data

were weighted using a ratio of the data set weight provided to the average weight. This procedure was done to adjust the significance levels to reflect the sample size rather than the estimate inflated to the population total.

8. Three separate dependent dichotomous variables were used rather than a polytomous dependent variable because of an adjustment for period of risk for one of the explanatory variables, current age of the respondent.

9. When expressing log odds or odds to predicted probabilities, it must be realized that because the relationship between odds and probabilities is not linear some adjustment is necessary. Discussions of the misinterpretation of logistic regression results and corrective adjustments can be found in Petersen (1985) and Demaris (1990).

10. The probability was estimated using an exponential regression equation to continue the series for the age group 17-19.

11. Although not shown in Table 2, an analysis of non-response showed that beyond age, non-response was not associated with the other explanatory variables, region of residence, gender and language spoken at home.

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