

An Examination of The Seasonal Birth Pattern in Manitoba:
1920 to The Present

by

Timothy James Werschler

A thesis
presented to the University of Manitoba
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Geography

Winnipeg, Manitoba

(c) Timothy James Werschler, 1990



National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-63243-7

AN EXAMINATION OF THE SEASONAL BIRTH PATTERN IN MANITOBA:
1920 TO THE PRESENT

BY

TIMOTHY JAMES WERSCHLER

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

MASTER OF ARTS

© 1990

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this thesis, to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film, and UNIVERSITY MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

I hereby declare that I am the sole author of this thesis.

I authorize the University of Manitoba to lend this thesis to other institutions or individuals for the purpose of scholarly research.

Timothy James Werschler

I further authorize the University of Manitoba to reproduce this thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Timothy James Werschler

The University of Manitoba requires the signatures of all persons using or photocopying this thesis. Please sign below, and give address and date.

ABSTRACT

The objective of this thesis is to examine the seasonal birth pattern in Manitoba during the period 1920 to the present. First, a descriptive examination of the seasonal birth pattern from 1920 to 1985 is conducted. Second, the modern seasonal birth pattern is investigated by conducting questionnaire research on the reproductive behaviors and birth-month preferences of currently reproducing women in the city of Winnipeg.

The findings indicate that the seasonal birth pattern in Manitoba has undergone considerable change during the period 1920-1985. These changes are linked to broad socio-economic and demographic changes within the province during this period. The questionnaire survey data suggest that the modern seasonal birth pattern is influenced to some extent by a group of seasonal birth planners within the currently reproducing population. To conclude, some directions for further research are suggested.

ACKNOWLEDGMENTS

The author wishes to acknowledge the contribution of several individuals and agencies to this research effort. First, recognition is given to those agencies through which the questionnaire survey was administered (Appendix E). Without the cooperation of these offices, this research project would not have been possible.

An acknowledgment is also given to the members of the thesis committee. Professor Shiva Halli and Professor William Norton offered helpful comments during the writing of the manuscript. A special acknowledgment is reserved for Professor Geoffrey Smith, who served as thesis advisor.

CONTENTS

ABSTRACT	iv
ACKNOWLEDGMENTS	v

<u>Chapter</u>	<u>page</u>
I. INTRODUCTION	1
Thesis Objectives	1
Organization of The Thesis	1
Background to The Study	2
Contributions of The Thesis	4
II. LITERATURE REVIEW	5
Chapter Organization	5
The Effect of Climate on Seasonal Birth Patterns	6
Work Cycles And Seasonal Birth Patterns	7
Socio-Economic Status And Seasonal Birth Patterns	8
The Influence of Birth Planning on Seasonal Birth Patterns	10
Chapter Summary	11
III. THE SEASONAL BIRTH PATTERN IN MANITOBA	12
Chapter Organization	12
The Data	12
Examination of The Seasonal Birth Pattern	13
Amplitude of the Seasonal Birth Pattern	17
Disaggregation of The Modern Seasonal Birth Pattern	19
Chapter Summary	21
IV. DATA SOURCES AND SAMPLE DESIGN	22
Chapter Organization	22
Sample Population And Study Area	22
The Questionnaire Design	26
The Questionnaire Survey	27
Pre-test of The Questionnaire	27
The Main Survey	27
Response Rates	29
Chapter Summary	30

V.	ANALYSIS OF THE SURVEY RESULTS	31
	Chapter Organization	31
	Composition of The Sample	31
	Preferences For Month of Birth	34
	Importance of a Seasonally Planned Birth	39
	Respondents Who Seasonally Planned a Birth	40
	Chapter Summary	44
VI.	SUMMARY AND IMPLICATIONS	46
	The Findings	46
	The Seasonal Birth Pattern in Manitoba:	
	1920-1985	46
	Results of The Questionnaire Survey	48
	Implications of The Findings	51
	Directions For Future Research	52

	<u>Appendix</u>	<u>page</u>
A.	MANITOBA BIRTHS BY MONTH OF OCCURRENCE: 1920-1985	54
B.	RATIO SCORES OF MANITOBA BIRTHS: 1920-1985	56
C.	WINNIPEG BIRTHS BY MONTH OF OCCURRENCE: 1975-1988	58
D.	RATIO SCORES OF WINNIPEG BIRTHS: 1975-1988	59
E.	LIST OF DATA COLLECTION POINTS	60
F.	THE QUESTIONNAIRE	62
G.	MODIFICATIONS TO THE QUESTIONNAIRE	66
	BIBLIOGRAPHY	67

LIST OF FIGURES

<u>Figure</u>	<u>page</u>
3.1. Seasonal Birth Pattern in Manitoba: 1920-1985 . . .	14
3.2. Disaggregation of The Seasonal Birth Pattern: 1975-85	20
4.1. Location of Sampling Points in Winnipeg	24

LIST OF TABLES

<u>Table</u>	<u>page</u>
3.1. Urban/Rural Population Distribution in Manitoba: 1920-1986	15
3.2. Amplitude of the Seasonal Birth Pattern: 1920-1985	18
4.1. Summary of Interviews Completed at The Sampling Locations	25
5.1. Composition of Entire Sample	32
5.2. Birth-Month Preferences of The Respondents	34
5.3. Reasons For Choosing the Most Preferred Birth- Month	37
5.4. Reasons For Choosing The Least Preferred Birth- Month	38
5.5. Importance of a Seasonally Timed Birth	40
5.6. Proportion of Seasonal Birth Planners in Sample . . .	41
5.7. Characteristics of Planners And Non-Planners . . .	42
5.8. Reasons For Timing a Birth Cited by Planners . . .	43

Chapter I

INTRODUCTION

1.1 THESIS OBJECTIVES

The objective of this thesis is to examine seasonal birth patterns in Manitoba, Canada. Seasonal birth patterns are defined as the seasonal variation of births within a population. The specific research objectives of this thesis are twofold:

1. to examine the seasonal birth pattern in Manitoba during the period 1920-1985.
2. to analyze the modern seasonal birth pattern by conducting questionnaire research on the reproductive behaviors and birth-month preferences of currently reproducing women in the city of Winnipeg.

1.2 ORGANIZATION OF THE THESIS

The remainder of Chapter 1 deals with two other introductory topics. First, the background to the study is discussed. Second, the contributions of the thesis to the existing corpus of relevant research are identified. Chapter 2 surveys the related literature in this field.

Chapter 3 examines the seasonal birth pattern in Manitoba during the period 1920-1985. The chapter focuses primarily on the changes which have occurred in the pattern over time.

Chapters 4 and 5 examine the modern seasonal birth pattern in Winnipeg. Chapter 4 considers the data sources and sample design. In chapter 5, the questionnaire survey data are presented. These data are used to interpret the seasonal birth pattern within the city of Winnipeg.

Chapter 6 provides an overview of the main findings of the study, and makes some recommendations for further research.

1.3 BACKGROUND TO THE STUDY

Seasonal birth patterns have been observed in almost all human populations. As background information, the research on seasonal birth patterns in Canada will be briefly discussed. A full review of the relevant literature will be conducted in the following chapter.

There have been five studies on seasonal birth patterns in Canada. Three of these examined the birth patterns of Canadian Inuit (Condon, 1982; Condon and Scaglione, 1982; and Ehrenkrantz, 1983). Generally, the findings among the Inuit reveal that most births occur in the first half of the year. The peak birth months are March/April. The fewest births occur in October/November. The birth pattern of this

population seems to be influenced by physiological and sociological responses to extreme seasonal variation of environmental conditions (Condon, 1982 :167; Ehrenkrantz, 1984 :23). The conception peak is associated with the warmest month of the year, and with the longest days.

Cowgill (1966) examined the seasonal birth pattern in Canada during the period 1920-1962. During this period, there is a birth peak in March and a trough in November. Within Canada, the birth patterns in Manitoba, Saskatchewan, Alberta, and Quebec exhibit the greatest provincial "seasonality." Cowgill also notes that the amplitude of the birth pattern decreases after 1920. The amplitude of the seasonal birth pattern is defined as the magnitude of the variation of the birth pattern from the lowest birth month to the highest birth month.

Halli (1989) conducted an analysis of the contraceptive practices and the seasonal birth pattern of over 5000 Canadian women. The data were extracted from the 1984 Canadian Fertility Survey Halli observed that the peak birth months (August/September) lagged behind the most preferred birth months (April/May). Halli suggests that some couples attempt to target the arrival of their children toward spring, however, the delay between contraceptive cessation and successful pregnancy results in a birth peak during August/September.

These studies indicate that there are both spatial and temporal variations in the seasonal birth pattern in Canada. The researcher must be conscious of these variations, for it follows that the determinants of the birth pattern vary across space and time.

1.4 CONTRIBUTIONS OF THE THESIS

This thesis makes two contributions to the body of knowledge on seasonal birth patterns. First, this work attempts to verify and extend Cowgill's research on the seasonal birth pattern in Manitoba. This thesis will present 65 years of seasonal birth data in Manitoba, Canada. Such a record may be useful in discussing the longer-term changes in the seasonal birth pattern as they are effected by broad socio-economic and demographic changes within the province.

Second, this work contributes to the literature by conducting a detailed analysis of the modern seasonal birth pattern within an urban, contraceptive using population. This is achieved by way of questionnaire research on the reproductive behaviors and birth-month preferences of currently reproducing women in the city of Winnipeg, Manitoba.

Chapter II

LITERATURE REVIEW

2.1 CHAPTER ORGANIZATION

Seasonal birth patterns have long been of interest to geographers (Huntington, 1938). This is because seasonal birth patterns are seen to reflect the influence of economic, climatic, and social factors on human fertility. Contributions to the literature in this field have also been made by physiologists, demographers, sociologists, and economists. As a result of the diverse research into seasonal birth patterns, there are numerous hypotheses which purport to explain the phenomenon. Initial research in this field focussed on the role of climate in the determination of seasonal birth patterns. Later research examined the influence of work cycles and socio-economic status on the seasonal birth pattern. Recent work investigates the influence of birth-month preferences on seasonal birth patterns. In this chapter, each of these research directions are discussed in turn, and their application to the current research is outlined.

2.2 THE EFFECT OF CLIMATE ON SEASONAL BIRTH PATTERNS

Many of the studies on seasonal birth patterns investigate the role of climate in the determination of conception rates (Takahashi, 1965; Stoekal and Chaudhurry, 1972; Mathers and Harris, 1983). These studies indicate that climatic extremes act to decrease the coital frequency and/or fecundity of the individual.

Siever (1985) is a frequently cited paper which examined U.S. birth data by state. The data were compiled into 10 year periods from 1947 to 1976. The paper tests whether climate is related to the birth season. For the post-war period, the low birth season was April/May, and the birth peak was September. April/May births are associated with July/August conceptions. It was found that the magnitude of the April/May trough is most pronounced in the warmest states. Seiver argued that in the lower latitudes of the U.S., the summer months become so warm as to produce a reduction in coital frequency and/or the fecundity of the population.

Condon (1982) studied seasonal birth patterns in the Canadian Arctic. Condon's hypothesis was that the dramatic semi-annual changes in the climate of this region would affect the birth cycle. Indeed, both planned and unplanned births occurred predominantly in the first half of the year. He found that the use of contraception acted to further reinforce the seasonal pattern.

The above studies suggest that in societies which experience extreme climatic variation, the seasonal birth pattern can be influenced by climate. These findings however, have limited application to the study of the seasonal birth patterns of urban societies. In urban environments, the effects of climatic variation have been moderated through technology. A further difficulty in interpreting the effects of climate on the seasonal birth pattern is that climate also influences several other social and economic activities. As a result, it is difficult to determine whether the seasonal birth pattern is influenced directly or indirectly by climate.

2.3 WORK CYCLES AND SEASONAL BIRTH PATTERNS

There are two hypotheses regarding the association between work cycles and seasonal birth patterns. First, coital frequency and/or fecundity may decrease due to increased labour activity. Thompson and Robins (1973) studied the seasonal variation in conceptions in rural Uganda, and found that the conception rate increased whenever the agricultural work-load decreased.

Second, births may be timed so as not to interfere with peak work periods. Levy's (1986) analysis of seasonal fertility cycles in rural Egypt revealed that many couples timed the births of their children in order that they would not interfere with the labour-intensive months of the agricultural cycle.

These studies conclude that the seasonal birth pattern can also be influenced by the work cycle. In most cases, births are timed away from the labour-intensive seasons.

2.4 SOCIO-ECONOMIC STATUS AND SEASONAL BIRTH PATTERNS

Several studies on the relationship between socio-economic status and the seasonal birth pattern have been conducted in the United States (Pasamanick, 1960; Zelnick, 1969; Chaudhury, 1972; Warren and Tyler, 1979). These studies observe that the amplitude of the seasonal birth pattern is greater for low status groups. The birth pattern of the low status groups was found to be subject to greater variation, possibly due to less secure sources of income, inadequate housing, and variations in the nutritional quality of the diet. In the United Kingdom, however, James (1971) indicates that the amplitude of the seasonal birth pattern is greater in the high status groups. He speculates that this could be due to the fact that the upper status groups enjoy longer and more mobile holidays. Births in the high status groups are timed so as not to interfere with the holiday schedule. The seasonal birth pattern for the U.K. is a reliable February to May peak with a secondary peak in August. The trough is November/December.

In Lam and Miron (1987), the historical seasonal birth patterns of England, Luxembourg, Japan, and Sweden are examined. The authors found that the amplitude of the

seasonal birth pattern generally decreased over time. The decrease in the amplitude of the seasonal birth pattern is attributed to the advanced socio-economic development of these countries.

Cowgill (1966) is credited with the earliest analysis of the seasonal birth pattern in Canada. The results indicate that during the period 1920-1962, there is a March birth peak, and a lull in November. She found that the amplitude of the birth pattern is most pronounced in Quebec, Manitoba, Saskatchewan, and Alberta. The provinces with the lowest amplitude are British Columbia and Ontario. All the provinces with high seasonality (amplitude) were agriculturally based economies during that time. Cowgill argued that with increasing industrialization and urbanization, there would be a more stable food supply, and the environment would be moderated through better housing, clothing, etc. With moderation of environmental conditions, there is a concomitant moderation of the seasonal birth pattern.

In general, these studies indicate that increases in socio-economic status reduce the amplitude of the seasonal birth pattern. The amplitude of the seasonal birth pattern in modern societies is normally less than in pre-industrial societies. Nonetheless, there can be very distinct seasonal birth patterns in modern societies.

2.5 THE INFLUENCE OF BIRTH PLANNING ON SEASONAL BIRTH PATTERNS

In modern industrial societies, it is possible that contraceptive practices and unconstrained preferences for month of birth significantly influence the seasonal birth pattern. This possibility has only recently been investigated.

Shimura (1981) noted that the introduction and subsequent widespread use of oral contraceptives in the U.S. did not appear to change the nature of the U.S. birth pattern. The seasonal birth patterns of contracepting and non-contracepting couples were similar, but the pattern for contraceptors was of a greater amplitude. The greater seasonality of births among contracepting couples is an indication that effective contraceptive methods allow births to be more accurately timed.

Recent works by Rodgers (1984), and Rodgers and Udry (1985), indicate that birth-month preferences may significantly influence the seasonal birth pattern. Rodgers (1984) revealed a strong preference for April/May births in a sample of Wisconsin women. Data collected on the birth pattern of contracepting individuals revealed that there was a consistent August/September birth peak. The birth peak lagged behind the most preferred birth season by 3 to 4 months. Rodgers and Udry argue that there is a delay of approximately 3 months between contraceptive cessation and

conception. Rodgers and Udry attribute the secondary peak in February/March primarily to non-contraceptors. This suggests a biological basis for the secondary birth peak in February/March. These studies indicate that in modern societies, birth-month preferences may influence the seasonal birth pattern to some degree.

2.6 CHAPTER SUMMARY

The literature review has demonstrated that much research has been undertaken in an effort to increase understanding about seasonal birth patterns. The seasonal birth pattern is influenced by factors such as climate, work cycles, and socio-economic status. The effects of climate on the birth pattern are most pronounced in non-industrialized economies, and in areas where there is extreme seasonal variation in climate. Work cycles have most influence on birth patterns in rural-agrarian settings. Recent research indicates that with the introduction and subsequent widespread use of highly effective contraceptive methods, seasonal birth patterns may be increasingly influenced by birth-month preferences and other sociological factors. These findings are applicable to urban-industrial economies.

Chapter III

THE SEASONAL BIRTH PATTERN IN MANITOBA

3.1 CHAPTER ORGANIZATION

This chapter examines the seasonal birth pattern in Manitoba during the period 1920-1985. First, the data source is discussed. Second, a descriptive examination of the seasonal birth pattern is conducted. Third, a summary of the main findings is offered.

3.2 THE DATA

The data were obtained from Vital Statistics data for Manitoba. The Vital Statistics data record births by month and year, from 1920 to 1985 (Appendix A).

Two adjustments are made to the birth data in order to facilitate an examination of the seasonal birth pattern. First, the data are adjusted for variations in the length of month according to the following formula:

$$B_{ai} = (B_{ri} / n_i) * 30.4375$$

where:

B_{ai} = adjusted number of births for month i
 B_{ri} = unadjusted number of births for month i
 n_i = number of days in month i

In the case of February, a leap year correction is also made.

Second, the adjusted birth data are converted to ratio scores, which allow different series of birth data to be contrasted (Appendix B). Ratio score data are computed by:

$$R_i = (O_i / E_i) * 100$$

where:

R_i = ratio score for month i
 O_i = observed number of births in month i
 E_i = expected number of births in month i

The expected number of births is derived by dividing the total number of births in year i by 12 (the number of months in a year). Ratio values are expressed as the percentage deviation from the mean monthly number of births in a given year. This method of data conversion is conventional in the literature (Cowgill, 1966; Holland, 1989).

3.3 EXAMINATION OF THE SEASONAL BIRTH PATTERN

In order to examine the changes which have occurred in the seasonal birth pattern, the ratio score data are compiled into four periods: 1920-1939, 1940-1959, 1960-1974, 1975-1985. Figure 3.1 illustrates the seasonal birth pattern in Manitoba for each period.

The 1920-1939 period is characterized by a prominent February-April birth peak. The above average birth months were February to September. The lowest birth months were November/December. In the literature, an early spring birth peak is often attributed to the effects of the agricultural cycle (Nurge, 1970; Mosher, 1979; Knodel, 1981; Levy, 1986).

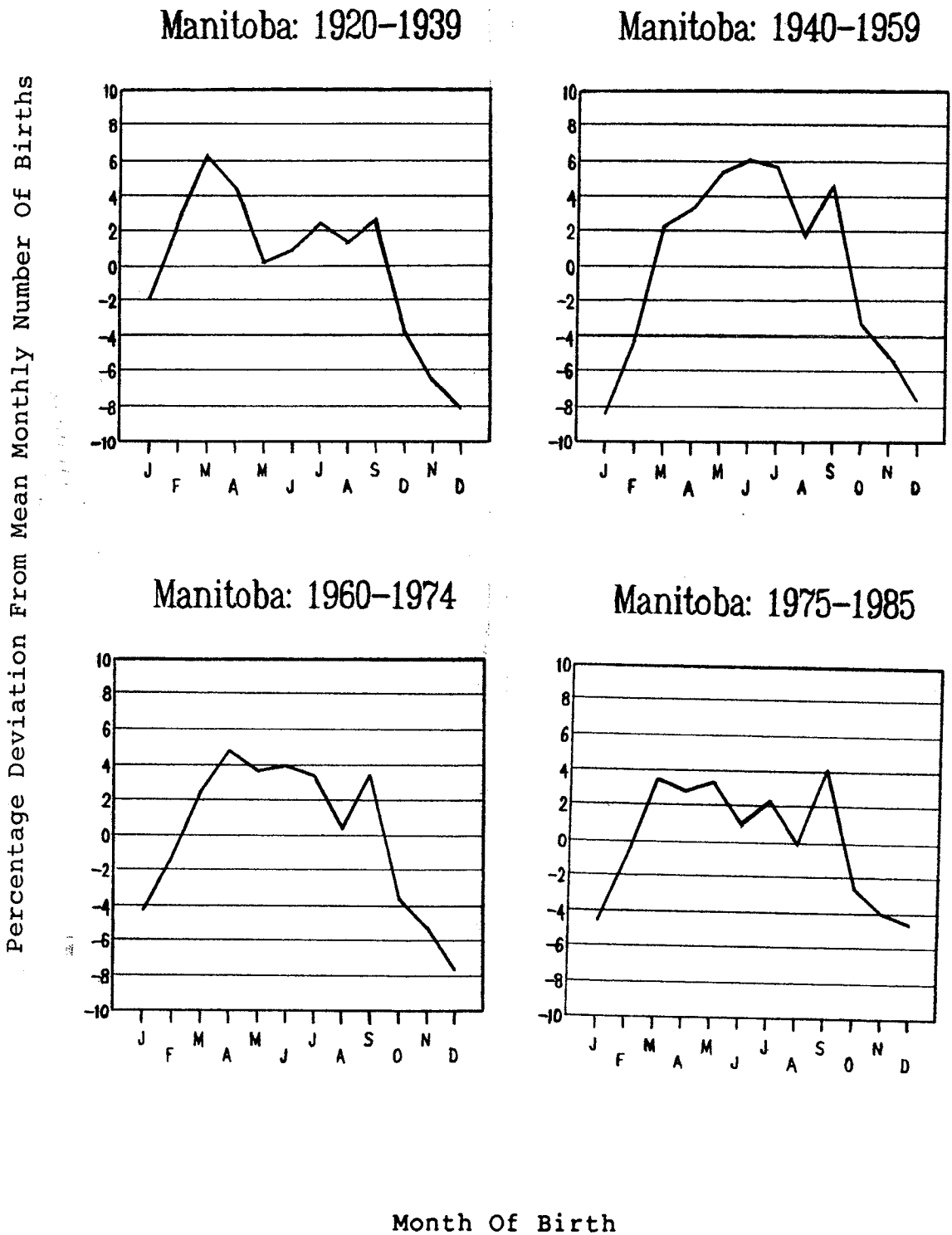


Figure 3.1: Seasonal Birth Pattern in Manitoba: 1920-1985

There are two reasons why early spring births would be preferred. First, a February-April birth means that a woman would not be in the advanced stages of pregnancy during the harvest (September). This would allow her to participate fully in the harvest activities. Second, an early spring birth would allow the woman ample post-natal recuperation time in order to participate in the spring sowing of the crops and gardens.

Table 3.1 illustrates the percentage urban/rural population distribution in Manitoba during the period 1921-1986. During the 1920-1939 period, Manitoba's population was approximately 57% rural. Manitoba's overall seasonal birth pattern was thus significantly influenced by that of the rural population. In addition to this, the seasonal birth pattern in many smaller urban centers may also have been influenced by the agricultural cycle. The economies in the smaller towns were, in many instances, directly linked to the agricultural cycle because they served as supply and transport centers for the surrounding

TABLE 3.1

Urban/Rural Population Distribution in Manitoba: 1920-1986

Year:	1921	1931	1941	1951	1961	1971	1981	1986
% Urban:	42.9	45.1	41.1	56.6	63.9	67.1	71.2	72.1
% Rural:	57.1	54.9	58.9	43.4	36.1	32.9	28.8	27.9

source: Statistics Canada

agricultural communities.

In the 1940-1959 period, a considerably different seasonal birth pattern is evident (Figure 3.1). The first observation that can be made about the 1940-1959 period is that the primary birth peak shifted from spring to summer. It is possible that changes in the rural/urban distribution of Manitoba's population influenced the change in the seasonal birth pattern. The economic diversification of the province during the post-war period influenced the rapid urbanization of the population during the period 1940-1959 (Table 3.1). During this period, Manitoba's overall seasonal birth pattern became heavily influenced by that of the urban population. The work/holiday cycle and birth month preferences of urban residents may have influenced a summer birth peak.

The mechanization of agricultural operations during the post-war period may also have influenced a shift in the birth peak within the rural population. Reductions in female labor demand as a result of increased mechanization, may have reduced the importance of a late-winter birth (Lam and Miron, 1987). Births could be targeted to other months without interrupting the agricultural work cycle.

The second feature of the 1940-1959 period is a secondary birth peak in September. The secondary birth peak in September has often been attributed to the "Christmas

holiday effect." Lam and Miron (1987) attempt to explain the seasonal birth pattern of Sweden by suggesting that the September birth peak is influenced by increased coital activity during the previous December. Whatever the cause, the birth peak in September becomes a feature of Manitoba's seasonal birth pattern for this and the two subsequent time periods.

The 1960-1974 and 1975-1985 periods are characterized by a weakening spring peak and winter trough. In the 1975-1985 period, September becomes the peak birth month. At first glance, the 1960-1985 period may be interpreted as a period of transition in which the spring birth peak is replaced by the September birth peak. In actuality, the magnitude of the spring peak and winter trough decrease substantially, while the magnitude of the September peak remains relatively constant. In order to interpret the changes in the birth pattern during this period, the changes in the amplitude of the seasonal birth pattern must be considered.

3.3.1 Amplitude of the Seasonal Birth Pattern

The amplitude of the seasonal birth pattern is the magnitude of the variation from the lowest birth month, to the highest birth month. Table 3.2 indicates the amplitude of the seasonal birth pattern according to the time periods used above.

TABLE 3.2

Amplitude of the Seasonal Birth Pattern: 1920-1985

Year Block	Ratio Score of Peak Month (%)	Ratio Score of Lowest Month (%)	Amplitude of Birth Pattern (%)
1920-1939	6.2	-8.2	14.4
1940-1959	6.1	-8.5	14.6
1960-1974	4.8	-7.6	12.4
1975-1985	4.2	-4.6	8.8

The first feature that can be observed in Table 3.2 is that the amplitude of the seasonal birth pattern has decreased over time. This finding is supported by Cowgill (1966) and Lam and Miron (1987), who state that the amplitude of the seasonal birth pattern decreases with the socio-economic development of a society. This decrease may also be due to the increased use of highly effective contraceptives after 1960 (Shimura, 1981). With near universal use of highly effective contraceptives, seasonal variations in coital frequency no longer influence great variations in births. As a result, the amplitude of the birth pattern decreases.

A second observation is that the magnitude of the mean minimum birth ratio is greater than that of the mean maximum birth ratio, in each period. These data undoubtedly reflect the fact that it is simply easier not to conceive, than to accurately time the arrival of a child.

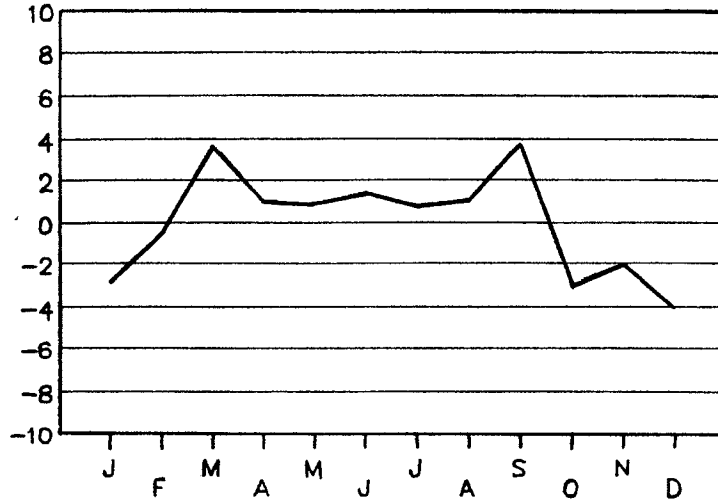
3.4 DISAGGREGATION OF THE MODERN SEASONAL BIRTH PATTERN

Figure 3.2 illustrates the modern seasonal birth pattern of Winnipeg, and that of Manitoba (Winnipeg excluded). The seasonal birth pattern of Manitoba (Winnipeg excluded) is characterized by birth peaks in March and September, and by a trough in December/January. Some couples may target the births of their children toward the spring so that the birth does not interfere with the agricultural work cycle. The September birth peak may be influenced by the Christmas holiday effect. Increased coital activity during the Christmas season may result in an increase in births during the following September.

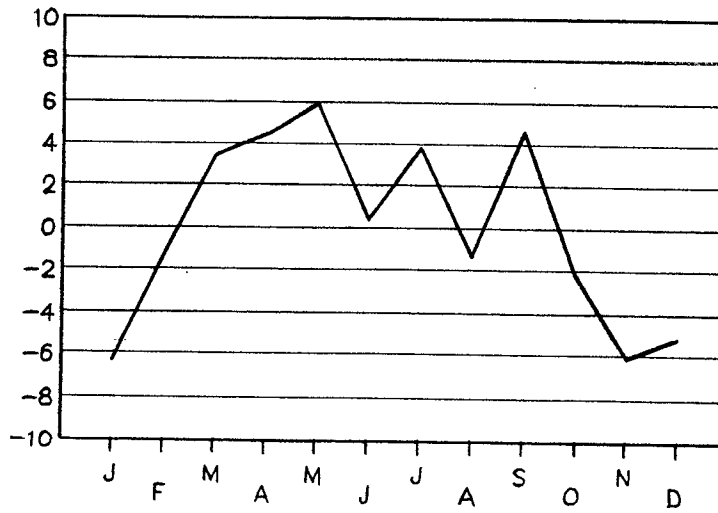
The seasonal birth pattern within Winnipeg is characterized by a birth peak in April/May, and a trough from November-January. It is possible that the birth peak in spring is influenced to some extent by the seasonal birth planners within the population of Winnipeg. The Christmas holiday effect may influence the secondary birth peak in September. The modern seasonal birth pattern in Winnipeg will be further interpreted in Chapters 4 and 5, through an analysis of the questionnaire survey data.

Manitoba (Winnipeg Excluded)

Percentage Deviation From Mean Monthly Number Of Births



Winnipeg



Month Of Birth

Figure 3.2: Disaggregation of The Seasonal Birth Pattern: 1975-85

3.5 CHAPTER SUMMARY

Substantial changes have occurred in the birth pattern during the period under consideration. The most significant change in the birth pattern is the distinct shift from a spring birth peak in the 1920-1939 period, to a summer peak in the 1940-1959 period. This shift may have been associated with the rapid urbanization of the province during this period, and with the post-war industrialization of Manitoba's economy.

The second substantial change has been the marked decrease in the amplitude of the seasonal birth pattern after 1960. This decrease may be the result of continued socio-economic development within the province, and the introduction of effective contraceptive methods. Disaggregation of the data has revealed that there are variations in the seasonal birth pattern within the province. These variations may be attributable to economic and social differences between the urban and rural populations in the province.