THE DEMOGRAPHY OF ADULT FUNCTIONAL LITERACY: THE CASE OF FOREIGN SPEAKING IMMIGRANTS IN CANADA

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Abstract

This thesis has as its major source the comprehensive and reliable database of the 1989 National Survey of Literacy Skills Used in Daily Activities. The chief aim is two fold: first,to explain the effects of selected demographic and socioeconomic variables on the foreign speaking immigrants' functional literacy in either one of the Canada's official languages; and, second, to explain the effects of these variables on their financial earnings.

The problem of attaining functional literacy in English or French experienced by foreign speaking immigrants is presented with reference to the Canadian historical, cultural and social context. Given the properties of functional literacy, which are context dependent, the writer is led to pose the following basic research questions: What are the major determinants of the functional literacy competencies of Canadian foreign speaking immigrants? and What are the effects of immigrant functional literacy, on the incomes of foreign speaking immigrants when controlling for the effects of social and demographic variables?

An analysis of the related literature lays a theoretical foundation for the research. The statistical technique of ordinary least squares regression is used to analyze the data.

The basic research questions are addressed and hypotheses tested within demographic and socioeconomic models. The findings show that the effects of many of demographic and socioeconomic factors are powerful and significant predictors of immigrant literacy abilities and achievement in English or French; especially age group membership, age starting learning English or French, the highest level of schooling completed before entry to Canada, and English or French spoken most often outside the home. Differences in the period of immigration, origin of birth (ethnicity) and occupational groups are also apparent in terms of literacy abilities and achievement.

Literacy variables, however, tend to have little influence on immigrant income. Gender, education, age, ethnicity and language are far more powerful than functional literacy in determining the personal incomes of foreign speaking immigrants.

The theoretical and practical implications of the research findings are addressed in the concluding chapters.

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TABLE OF CONTENTS

Page

Abstract.....ii

Acknowledgements.....iv

Table of Contents.....vi

List of Tables.....ix

List of Figures.....x

1. Context of the Study.....1

Introduction.....1
The Concept of Literacy.....2
Background to the Problem.....8
Brief History of Immigration in Canada.....9
Brief Overview of Immigrant Literacy.....13
Purpose of the Study.....18
Assumptions.....19
Basic Models and Research Questions.....20
Effects of Personal Predictors.....24
Effects of Social Context Predictors.....24
Effects of Educational Predictors.....25
Effects of Language Predictors.....25
Effects of a Socioeconomic Predictor.....26
Limitation of the Study.....26
Significance of the Study.....27

2. Review of Related Literature.....29

Introduction.....29
Literacy Research.....30
Historical Perspectives.....31
Philosophical Perspectives.....37
Psychological Perspectives.....45
Sociological Perspectives.....54
Immigrant Literacy Research.....63
Cultural Perspectives.....65
Political Perspectives.....71
Variables Which Influence Immigrant Literacy.....76
Personal Predictors.....77
Social Context Predictors.....78
Educational Predictors.....80
Language Predictors.....83
The Socioeconomic Preditor and the Dependent Variable 85
Conclusions.....86

3. **Methodology**.....89

Information on the Survey and Data.....90
Sampling.....90
Survey Instruments.....91
The Measurement of Functional literacy.....94

Data Collection.....97
Design of the Study.....98
Selecting the Sample of the Target Population.....99
Weighting the Data.....100
The Basic Models.....101
Two Stages of Model Development.....102
Description of Variables.....104
Personal Predictors.....105
Social Context Predictors.....106
Educational Predictors.....108
Language Predictors.....109
The Socioeconomic Predictor.....111
Endogenous and Intervening Variables.....113
The Dependent Variables.....115
Hypotheses.....115
Type of Methods.....122
Logit Regression and Probit Regression.....123
Ordinary Least Squares Regression.....124

4. **Results**.....125

Descriptive Analyses.....126
Comparisons Among Canadian Born Citizens and Immigrants in Literacy.....126
Comparisons Among Canadian Born Citizens and Immigrants in Income.....130
Summary.....131
Multivariate Analyses.....132
Factors Influencing the Reading and Numeracy Abilities of Non-official Language Speaking Immigrants in Canada.....135
Factors Influencing the Functional Literacy Achievements of Non-official Language Speaking Immigrants in Canada.....151
Analysis of the Effects on Personal Income of Non-official Language Speaking Immigrants in Canada.....160
Discussion of Findings.....171
Effects of Personal Predictors.....171
Effects of Social Context Predictors.....176
Effects of Educational Predictors.....177
Effects of Language Predictors.....179
Effects of the Socioeconomic Predictor.....181
Effects of Predictors on Income.....181

5. Conclusions.....184

Summary of the Findings in the Study.....185
Theoretical Implications of the Findings.....187
Practical Implications of the Findings.....191
Possibilities for Further Studies.....194

Bibliography.....196

Appendix A: Tables of Parameter Estimates.....202

Appendix B: Key to Variable Labels.....217

Appendix C: Key to World Regions of Origin.....221

LIST OF TABLES

Table Page

4.1 Means and Standard Deviations of the Literacy Variables and Income by Canadian Born Citizens and Immigrants, and by Official Language Speaking Immigrants and Non-official Language Speaking Immigrants.....128

4.2 Correlation Coefficients, Means, and Standard Deviations for the Variables in the Socioeconomic Model.....133

4.3 Standardized and Unstandardized Regression Coefficients and R s for Immigrant Literacy Variables (Model #1).....136

4.4 Standardized and Unstandardized Regression Coefficients and R s for Immigrant Financial Income (Model #2).....161

LIST OF FIGURES

Figure Page

1.1 Demographic Model #1.....21

1.2 Socioeconomic Model #2A.....22

1.2 Socioeconomic Model #2B.....23

CHAPTER ONE

Context of the Study

Literacy has been an international concern for decades. In Canada, however, it did not capture public attention until the 1970s when Canadian researchers became increasingly aware of the extent of illiteracy in the adult population. It has been realized since that illiteracy is not only the twin brother of poverty born in developing countries, but also a phenomenon to be found in industrialized countries. Canada faces the same serious problems of illiteracy as most developing countries, perhaps only at a different level of complexity. In Canada, as well as in other industrialized countries where levels of universal education are higher and the people have much more exposure to education than those in the developing countries, the criteria for literacy are also correspondingly higher. Although there are not many Canadians who are absolutely illiterate, a considerable proportion of the Canadian adult population is considered as being 'functionally illiterate' by normally accepted standards.

Immigrants comprise a large proportion of the 'functional illiterates' in Canada; and especially those with no English or French background. That is to say, a large number of foreign speaking immigrants make up the portion of the population lacking functional literacy in one of the official

languages. This has obviously attracted serious public concern, both from the government and academic institutions. In order to make an intensive and close study of the problem, this chapter will first discuss the concept of literacy as well as immigrant functional literacy and then survey the historical and social background of the problem. On that basis, it will construct the fundamental framework of the study by setting up two basic models and raising a series of related research questions which this study aims to address.

The Concept of Literacy

There is no universally or eternally applicable definition of literacy or illiteracy. Just like water or ice, there is no fixed form or shape for them. They can be streams, rivers, ice cubes or icebergs. Which form they might exist in totally relies on the environmental conditions and vessels that hold them. The concept of literacy changes over time and place; and depends as well on social, economic, and political contexts; and the same is true of illiteracy. Therefore, how literacy and illiteracy are defined depends on the literacy demands under certain conditions in different countries and cultures at given historical periods.

The classical definition of literacy and its adjective

form, literate, referred to a learned person who could read and write Latin. After the Reformation in 16th century, a literate person was further denoted as one who could read and write in one's own native language (Venezky, 1990). Modern usage of the term literacy, however, connotes a basic level of quality in reading, writing and numeracy. Since the 1950s, literacy has been viewed as a continuum of skills and competencies which are applied in a social context. In fact there exists a number of definitions for different levels of literacy on this continuum. Generally speaking, the continuum ranges from basic literacy to advanced literacy. In the technologically developed and print-oriented societies like West European countries, the United States and Canada, the levels of the literacy continuum are usually defined as follows (Thomas, 1983; Read & MacKay, 1984):

Basic Literacy. This is sometimes referred to as conventional literacy. At this level, the ability to read and write is limited to simple reading, writing and arithmetic tasks.

Survival Literacy. This level of literacy encompasses the basic skills and knowledge necessary for one to survive in a society, that is to say, to cope with one's social context and environment.

Functional Literacy. Functional literacy is related to social

and community development. It implies a level of literacy that sufficiently enable a person to function in a given social setting.

Technical Literacy. This is a high level in the continuum of literacy. Technical literacy is a set of skills and competencies required by specialists to facilitate the development of the society in specific domains. It includes humane literacy, scientific literacy, environment literacy, civic and political literacy, computer literacy, and visual literacy.

In order to develop the problem-solving capacities within a specialized field and reach the highest level on the literacy continuum, an underlying foundation of literacy skills is needed. Functional literacy actually serves as a bridge or the prerequisite for achieving technical literacy. In terms of the literacy continumm, functional literacy turns out to be a most appropriate definition as a goal for mass literacy in Canada (Read & Mackay, 1984). It may be considered a yardstick by which personal and national literacy and development are measured. Therefore, the concept of functional literacy will be the basic working definition for this thesis.

For the purpose of profiling the literacy skills in Canadian context from the Survey of Literacy Skills in Daily Activities, functional literacy is specifically defined as

missing from the original book

missing from the original book

literate in their first language. Therefore, it is not accurate and appropriate to report any rate of immigrant illiteracy without first indicating which pattern of immigrant illiteracy that rate represents. In the research on immigrant literacy, it is necessary and essential to draw the basic distinction between the immigrant literacy: being literate in the first language, the immigrant native language; and the immigrant literacy in one of the official languages: being functionally literate in one of the Canadian official languages, the immigrant's second language.

In addition, since functional literacy is phrased in terms of skills for the Survey of Literacy Skills in Daily Activities (LSUDA), it is impossible to bisect functional literacy into symmetric parts as "literacy" and "illiteracy". Functional literacy skills are relative and do not fall neatly into the above two categories. Therefore, it is worthwhile and more appropriate to express functional literacy on a continuum as well; a secondary continuum on the continuum of literacy, so as to avoid the improper application of the label of 'illiteracy'. Along this continuum, there are different levels for reading, writing and computation in terms of adequacy of meeting the demands of daily activities in today's society.

I conclude by stating the fact that functional literacy regarding immigrants in one of the official languages bears

even more complicated characteristics than does the general term "functional literacy". Also, it is important to emphasize the point that the present research attempts to study the functional literacy ability and achievement of foreign speaking immigrants in English or French, their second language, with a reference to their self assessment of literacy in their first language when possible.

Background to the Problem

Literacy research and study in Canada are more complex than those of most of other countries in the world. The simple truth lies in the fact that Canada is a multilingual (officially bilingual) country in which multiculturalism has been nourished in the past two decades. The immigration policy enables Canada to present its national population in a diversified pattern. This naturally generates a series of problems in terms of literacy. Canada has the regular literacy problems of every other country, and it also has its special and additional immigrant literacy problems. In order to properly investigate the immigrant functional literacy problems, it seems necessary to have an overall picture about the history of immigration in Canada.

Brief History of Immigration in Canada

As a matter of fact, immigration has always been a vigorous force in Canadian life. All Canadians are virtually immigrants or descendants of immigrants coming to the country during the past four centuries. Even the ancestors of the native Indians and Inuit were assumed to be the earliest "immigrants" from Asia to North America at some remote time. The continuous immigration has contributed tremendously to the formation of the nation and growth of the population.

Immigrants to Canada, however, were not evenly distributed over this history due to social, economic, and political constrains. Great swings have been observed in Canadian immigration since 1869. These reflected the fluctuation of immigration policy between openness and expansionism, and restraint and discouragement (Logan, 1991); it has also mirrored sets of curved lines of the social and economic development and conditions in both the immigrants' native land and Canada at the given periods.

According to Employment and Immigration Canada (1990), immigration policy in Canada was almost non-existent before 1867, being the result of the "laissez-faire" philosophy of the time. In 1869, the first Immigration Act was passed without exclusions from entry. In 1872 and 1879, amendments

were made to the legislation to exclude criminals and other 'vicious' classes, paupers and the destitute. In 1885, legislation was passed to restrain Chinese immigration by imposing upon them a heavy "head tax". During this period, there was a large demand for workers and farmers as the country was underpopulated with plenty of land and natural resources, while Europe was experiencing over-population and unemployment. Therefore, immigrants attracted to Canada came mainly from the British Isles, other European countries, and America.

Immigration continued steadily after the beginning of this century and in 1913 the number reached the historical peak of annual intake, a total of 400,870 (Ferguson, 1978). Canada kept its doors open to most immigrants until the eve of the Great Depression. As Employment and Immigration Canada (1990) recorded, government policies were changed to restrict immigration because of the social and economic pressures of 1929 Crash and prolonged drought in the Prairie at that time. Farm workers, relatives of landed immigrants and a few other occupational groups were not admitted. At the same time, the admissible Asiatic classes were reduced. During the Depression and the Second World War, immigration to Canada was discouraged and the numbers remained low. The majority of immigrants still came from Great Britain, the USA and the rest from other European countries during the pre-World War II

period.

After the Second World War, the conditions became favourable once again with the devastation of the European economy and the political crisis in Eastern Europe on the one hand and an unprecedented economic boom in North America on the other. Immigrants started pouring into the country in the 1950s, among whom the majority were European-born. They were from all parts of Europe: the United Kingdom, France, Italy, West Germany, Belgium, Netherlands, Poland, the U.S.S.R., Austria, Yugoslavia, Czechoslovakia, and Hungary. Some of them were admitted as refugees. The proportion of immigrants born in the USA dropped from 19% of the previous period to 3%. Asiatic immigration was still restricted because the government believed that the large-scale immigration from the Orient would give rise to social and economic problems due to the radical difference of oriental and occidental cultures (Hawkins, 1972).

By the 1960s, immigration from Europe declined as economic conditions improved there and the Canadian economic boom was over. According to Hawkins (1972), the new immigration regulations in 1962 marked a progressive change from the national origin restrictions, and the racial discrimination which until that time had been the major feature of Canada's immigration policy. The door was open to

people from other areas such as Asia, the East Indies, the West Indies, South and Central America, the Middle East and Africa. In addition, the Immigration Act of 1967 established the precise criteria known as the point system used in the selection of immigrants, with education, skill, and occupational demand as the main criteria. The number of arrivals increased for six successive years, and in 1967, it reached the highest of the decade, with immigrants coming from almost all over the world.

The immigration policies progressively developed in accordance with the changing needs for immigration at home and changing situation abroad since the sixties. According to Badets (1989), almost a half of today's immigrant population in Canada arrived after 1967. There have been rises and falls in number as well. However, the last two decades have witnessed major changes in the distribution of immigrants from different parts of the globe. In particular, the proportions originating in Asia, the Caribbean, Central and South America, and Africa have been increasing while the share from the traditional source countries such as Britain and the United States has been decreasing. People born in Asia, mostly in China, Hong Kong, India, the Philippines and Vietnam, formed the largest group of recent arrivals, representing 46% of all immigrants who came to Canada in the last decade (Logan, 1991; Employment & Immigration Canada, 1990).

According to 1986 Census, there were 3.9 million immigrants in Canada. They made up of 16% of the total population (Badets, 1989). Now, the population of over twenty-six million people is composed of people with diverse linguistic and cultural backgrounds, resulting from long and worldwide immigration. The two largest groups in the Canadian population are the English-speaking and French-speaking people, comprising about 87% of the total, and the remaining percentage is of the people whose native languages are neither English nor French. Since the pattern of immigration to Canada has been undergoing a big shift, the latter group is growing fast.

Brief Overview of Immigrant Literacy

As previously mentioned, the study of immigrant literacy in Canada is more complicated than that of literacy alone. Literacy for non-native speakers in a particular culture may be considered, therefore, as a thorny issue (Venezky, 1991). As the number of non-official language speakers is increasing rapidly in this country, immigrant literacy in one of the official languages has become a great concern both of the government and of the society.

Immigration acts as a supplementary contributor to national population growth. A larger population means more

producers and more consumers, which, in turn, results in a larger national market. Meanwhile, a larger population demands more services. Though there are more people competing for jobs, more employment opportunities are generated due to the growth of the population and production. Immigrants with qualifications meeting the prevailing needs of the developing economy fill the labour market gaps with less cost. In addition, immigrants from different cultural backgrounds bringing along their genuine talent and ethnic heritage are doubtlessly enriching the Canadian culture and reinforcing the development of multiculturalism (Ferguson, 1978). However, as revealed by the Southam Literacy Survey (1987), "immigration boosts Canada's functional illiteracy rate" (p. 22).

Immigrants have been selected carefully according to the regulations governing immigrant admission provided by the Immigration Act. The basic principles underlying immigration policy are as follows: "non-discrimination, the reunion of families, humanitarian concern for refugees, and the promotion of national goals, such as labour needs and public security" (Ferguson, 1978, p. 17). Three admissible classes of immigrants are categorised on the above basis: (a) family, (b) refugees, and (c) independent. The independent class consists of six sub-categories, which are assisted relatives, entrepreneurs, self-employed, investor, retired, and other independent.

The point-system criteria set up in 1967 only applies to the independent class, of which the knowledge of English and French counts 10% besides other criteria. Immigrants have been admitted into the country under one category or another to meet Canada's population and labour market needs. Though many immigrants admitted in the last decade came as independent applicants (43%), more than half fell into the other two categories, which are not subject to the point-system criteria (Logan, 1991). Therefore, the overall educational level and official language competency of immigrants are beyond control.

Inevitably, many of immigrants came into Canada, with little knowledge and skills in either of the official languages. In addition to quite a number of non-official-language speakers immigrating to Canada before 1960s, a great proportion of immigrants with non-English or non-French background came into the country since the door was open to people all over the world in 1960s. The quite recent shift in the pattern of immigration to Canada from the U.K and the U.S.A. to Asian and East European countries brought a lot more non-native speakers into Canada.

For these non-English or non-French speaking immigrants, the language deficit appears to be one of the greatest obstacles in their adaptation to the new country and to their cultural and institutional integration. In order to meet the

demands of the changed trend in immigration and the needs of new immigrants, a variety of language training programs have been offered to immigrants by federal and provincial governmental agencies as well as non-governmental associations. Nevertheless, the functional literacy needs of many immigrants in one of the official languages are not fully satisfied in certain programs for several reasons. Moreover, the language training programs are limited to cover only the immigrants who need them. In many cities, new immigrants have to be on the waiting list for quite a long time before being enroled in one of these language programs. Hence, immigrant functional literacy deficit in one of the official languages still remains a big problem and it has aroused great concern.

Two decades ago, Mackenzie and Reimers (1971) estimated in their study that 3.3 million Canadians were unable to read or write effectively. According to Read and MacKay's study in 1984, there were 3.5 million functional illiterate adults who had less than a grade 9 level of educational attainment. Immigrants from other countries other than the U.K. and the U.S. accounted for 18% of the functional illiterate population. That is to say, one out of five illiterates was an immigrant. According to the findings of the Southam study in 1987, the figure increased to 4.5 million. One adult in every four could not read or write at a level that would allow them to carry out regular daily tasks (Calamai, 1987). Fourty-two

percent of immigrants from countries other than those from English or French speaking countries were functionally illiterate. They made up 22% of all functional illiterates. Findings in the Southam Literacy Survey also indicated, "the three-million-plus immigrants now living in Canada barely nudge the national illiteracy level upwards, from 22 percent for native-born residents by themselves to 24 percent overall" (Calamai, 1987, p. 22).

In 1989, in preparation for the International Literacy Year of 1990, Statistics Canada conducted the most comprehensive survey of literacy skills ever performed in Canada. This research is based on the Statistics Canada database. The preliminary results from this survey, released in May 1990, confirmed that the lack of functional literacy remains a significant problem in Canada. Thirty-eight percent of adult Canadians aged 16 to 69 do not have reading and numeracy skills adequate to meet most everyday requirements. This percentage includes individuals without the ability to read at all (7% of Canada's adult population) and those with very limited numeracy ability (14%). Not surprisingly, certain groups among Canadians have a greater likelihood of having lower skill levels; for example, older age groups, those with low levels of educational attainment, and immigrants. It is shown that immigrants were more likely (52%) than Canadian born persons (34%) to have inadequate reading skills to meet

most everyday requirements (Statistics Canada, 1990, p. 8). Immigrants were also found to be more likely (43%) than Canadian born persons (37%) to have limited functional numeracy skills not sufficient to meet daily demands, most probably due to lack of ability to perform the numeracy operations requiring the use of documents and forms within the context of everyday life in Canada (Statistics Canada, 1990, p. 8). The reality of immigrant functional literacy in one of the official languages calls for both theoretical formulation and statistical analysis.

Purpose of the Study

Based on the database of the 1989 National Survey of Literacy Skills Used in Daily Activities, this research will concentrate on the study of the functional literacy in either one of the Canadian official languages of the immigrants whose mother tongue is neither English nor French. Taking into account the social and demographic aspects and characteristics of the target population, this writer will attempt to assess the relative literacy ability and achievement in order to investigate the effects of selected social and demographic factors on their literacy ability and achievement. In the same manner, the effect of literacy ability and achievement on the income of the group will be analysed, when controlling for

these same social and demographic factors.

Assumptions

It is assumed that the data provided by the 1989 National Survey of Literacy Skills Used in Daily Activities are the most extensive and reliable available for the study of the functional literacy in one of the official languages of foreign speaking immigrants. The sample of the target population selected from the data is also assumed to be the representative of foreign speaking immigrants in Canada. Further, this study will be conducted under the assumptions that personal variables (age, gender, period of immigration), social context variables (the immigrant's origin in terms of world regions, province of the immigrant residence), educational variables (parental educational attainment level, the highest level of schooling that the immigrant completed before he or she first immigrated to Canada, the highest level of educational attainment achieved in Canada), language variables (literacy proficiency in the first language, age starting learning English or French, language spoken at home, language spoken outside the home) and a socioeconomic variable (immigrant occupations), are all exogenous variables. Literacy ability and achievement (reading and numeracy) are assumed to be endogenous variables of the first consideration and intervening variables as well. Financial/economic income is

then the dependent variable of final interest.

Basic Models and Research Questions

Two basic models for the study are thus constituted on the basis of the above assumptions. The first one is the demographic model with literacy abilities and achievement as endogenous variables (see Figure 1). The second model is the socioeconomic model or covariance model, with literacy abilities and achievement as the intervening variable and financial income as the dependent variable (see Figure 2A and Figure 2B).

What are the major determinants of the functional literacy competencies of Canadian foreign speaking immigrants? What are the effects of immigrant functional literacy, in turn, when controlling for the social and demographic variables, on the income of those foreign speaking immigrants? These are the foremost questions to be addressed. The answers call for the estimation of the three basic model presented in Figures 1, 2A and 2B.

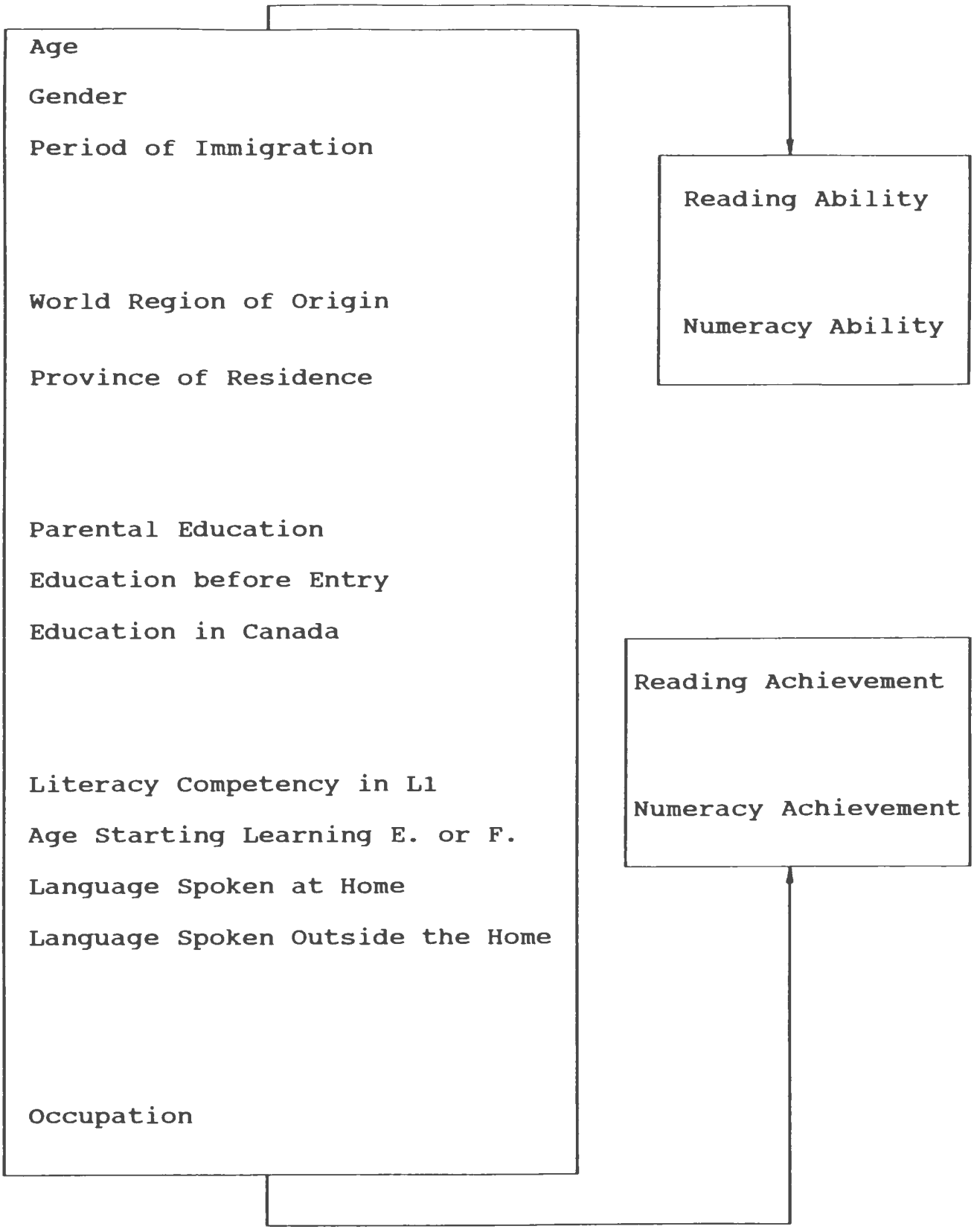

Figure 1.1. Demographic Model #1

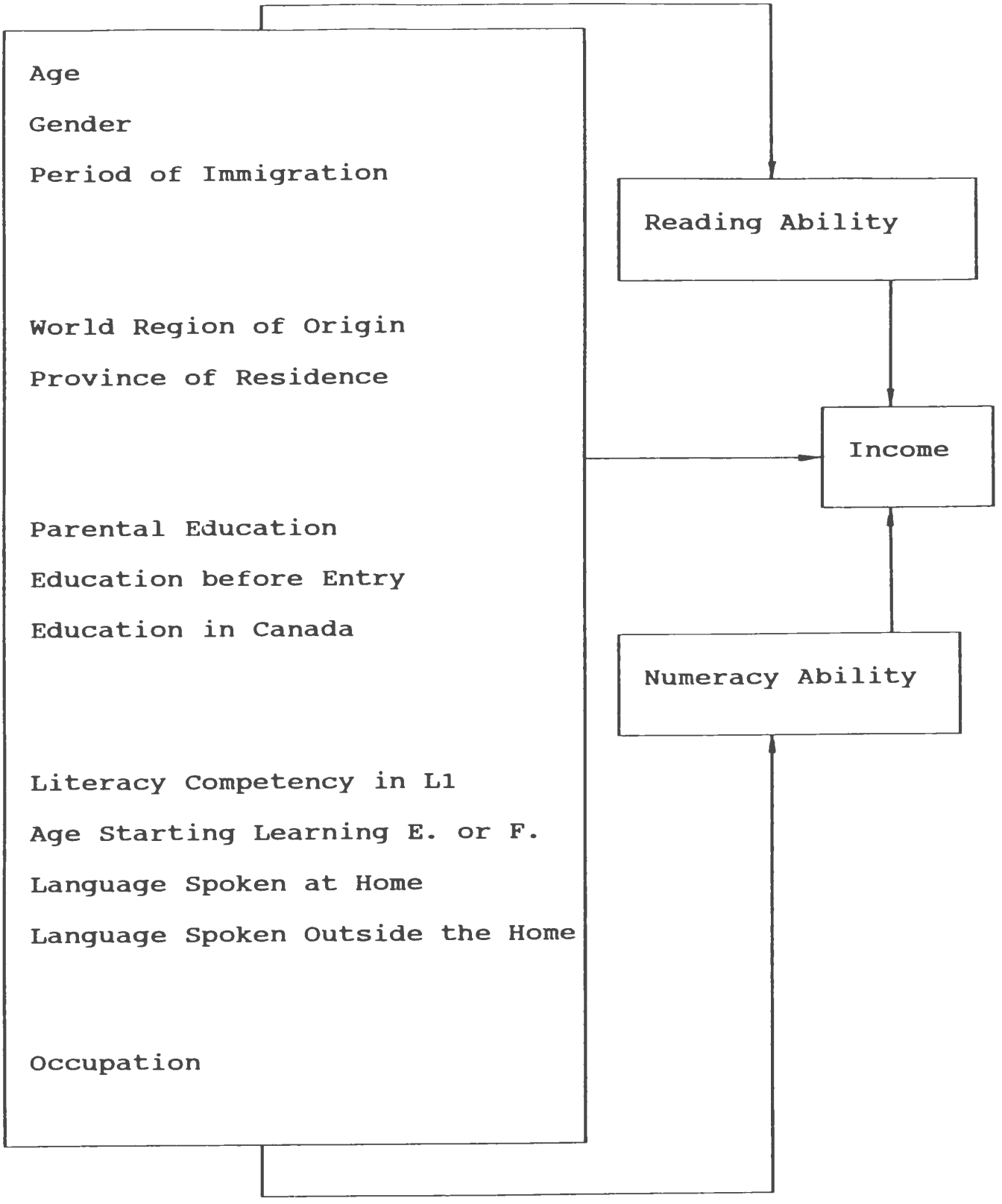

Figure 1.3. Socioeconomic Model #2A

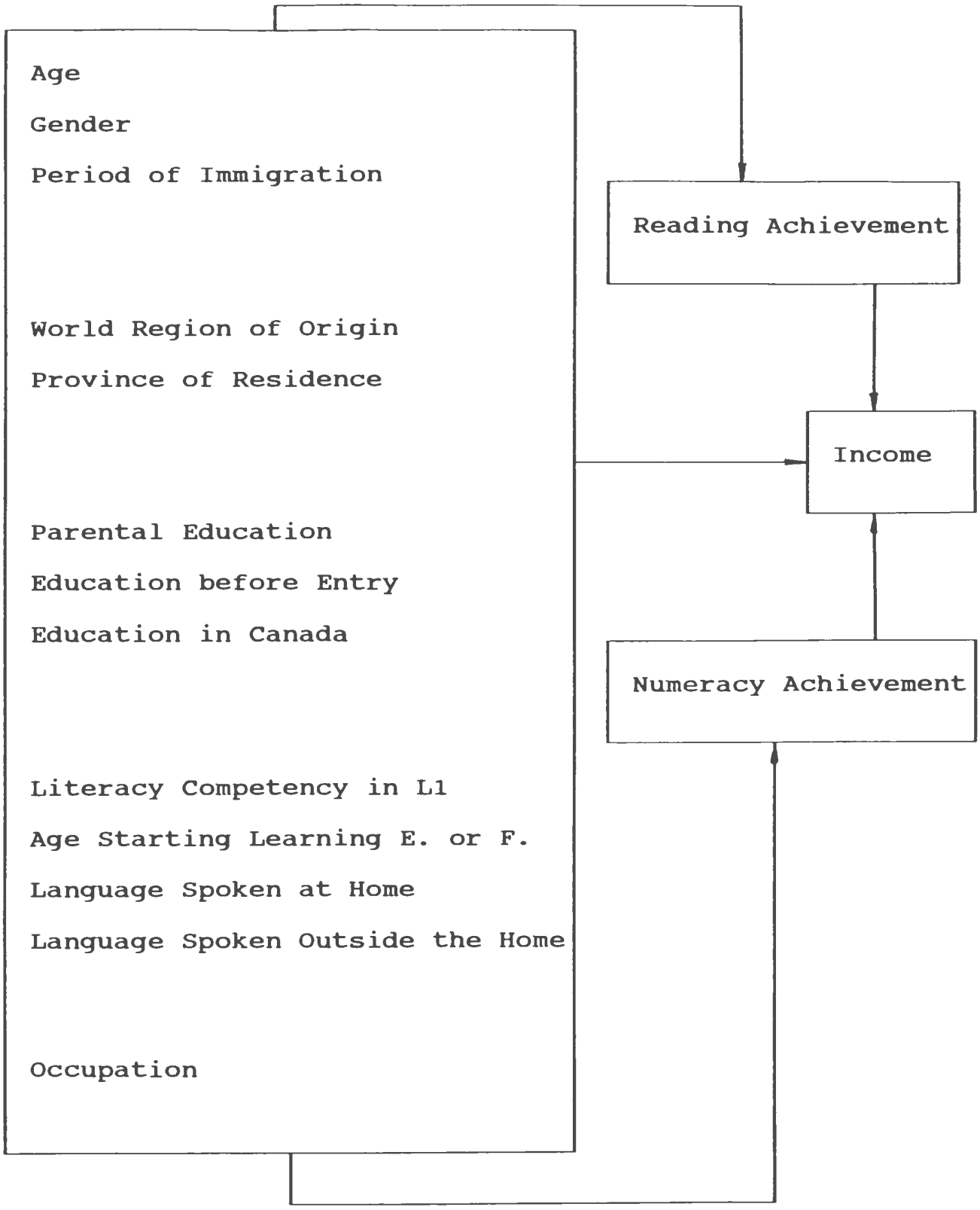

Figure 1.3. Socioeconomic Model #2B

The following are the specific and basic research questions addressed in the actual study.

Effects of Personal Predictors

1) Do age differences account for the differentiation in immigrant literacy abilities, functional literacy and immigrant income as well?
2) Does gender make a significant difference in immigrant literacy abilities, functional literacy in one of the official languages and immigrant income?
3) Is it true that the longer the immigrant has resided in Canada, the higher his or her literacy abilities and level of functional literacy in English or French, the higher his or her income would be?

Effects of Social Context Predictors

4) Do the world regions of origin make any difference in terms of literacy abilities, functional literacy and income?
5) Does the province of the immigrant's residence account for his or her literacy abilities, level of functional literacy and income?

Effects of Educational Predictors

6) To what extent does the immigrant's parental education influence his or her own literacy abilities, level of functional literacy and income?
7) What is the association (other things equal) between the highest level of immigrant schooling completed before entry and literacy abilities, and functional literacy in one of the official languages?
8) Is the variable 'highest level of the immigrant educational attainment achieved in Canada' critical in accounting for the immigrant literacy abilities, the level of his or her functional literacy in English or French as well as the immigrant income?

Effects of Language Predictors

9) What is the association between the self assessed literacy proficiency in the first language and literacy competency in the second language?
10) To what extent does the variable 'age starting learning English or French' influence the immigrant literacy abilities, and level of immigrant functional literacy?
11) Does the variable 'language spoken at home' make

any significant difference in the immigrant literacy abilities, his or her functional literacy competencies in one of the official languages and income as well?

12) What is the relationship between 'language spoken outside the home' and the immigrant literacy abilities, and level of functional literacy?

Effects of the Socioeconomic Predictor

13) How much does the immigrant's occupation account for his or her literacy abilities, functional literacy and income?

14) What difference does it make to the effects of the social and demographic factors on the income of immigrants when their literacy abilities and literacy achievement are taken into account?

Limitations of the Study

The study is limited, to a certain extent, by the nature of the National Survey of Literacy Skills Used in Daily Activities. As it is not a survey just done for the purpose of the study on immigrant functional literacy, the data it provided may not best satisfy the purpose of this study. For

instance, the variable of country of birth has been collapsed into eight groups of world regions: U.S.A., South America, Western Europe, Eastern Europe, Northern Europe, Southern Europe, Africa, Asia and Oceania. The variable of the native language has been collapsed into one: other, if not English or French. Besides, the only measure of non-official language literacy for foreign speaking immigrant respondents is a self assessment of literacy proficiency in their first language. As a result, some of the analyses cannot be accurately done with the data available.

In addition, those who reported having no skills in either of the two official languages and therefore did not take the literacy skill tests are excluded from the data (104 cases in the sample). The results, therefore, do not indicate the literacy proficiency of all adult immigrants. Under such circumstances, generalizations based on the findings will be made with these precautions in mind.

Significance of the Study

There have been a number of studies conducted in the field of functional literacy on a national scale, and the criteria and measurement used have been different, from grade 9 level of educational attainment to direct measure of

functional literacy. But, there are only a limited number of research projects ever done in the area of immigrant functional literacy.

This current study is based on the most comprehensive and powerful database available so far; and especially one with a reliable direct measure of adult functional literacy. In addition, the study employs the powerful ordinary least squares regression estimator to analyze the data. All these advantages of the study will promote clear and accurate pictures not only of the descriptive characteristics of foreign speaking immigrant functional literacy, but also of the relationships between socioeconomic and demographic variables and immigrant functional literacy abilities as well as economic earnings. Therefore, the research will, hopefully and ideally, yield findings to support both the theory and practice of immigrant literacy and ESL (English as second language) programs.

CHAPTER TWO

Review of Related Literature

Introduction

Immigrant literacy in one of the official languages has aroused great public concern, largely because Canada is a nation with citizens from diverse cultural and ethnical backgrounds; and the degree of its diversity is still increasing. As well, immigrant literacy has stimulated controversy because it has social, cultural and political implications. In Canada, cultural pluralism became the legitimate policy by replacing traditional cultural assimilation, yet institutional integration is hard to achieve. The cultural context seems to be favourable, but immigrants, more often than not, tend to be socially and economically disenfranchised. Immigrant literacy under such conditions, therefore, is dichotomous in terms of its uses. It can be an effective means of facilitating immigrants' adjustment to the new life in Canada and their full participation in the societal life; it can also be used as a 'gatekeeper' to prevent immigrants from being accepted as participatory and equal members in Canadian society.

In this chapter, I will examine both the vertical and horizontal axes of these issues in the light of related literature. Immigrant literacy is a subset within the general realm of literacy studies, sharing common themes and theories. Therefore, I will base

my literature review on the discussion of literacy from four different perspectives: 1) historical perspectives, 2) philosophical perspectives, 3) psychological perspectives, and 4) sociological perspectives. Discrepancies in different perspectives will be addressed, followed by a discussion of immigrant literacy from cultural and political perspectives. Then, results of previous researches and relevant literature will be discussed in the context of demographic and socioeconomic models in order to establish a theoretical framework for studying the personal contextual factors of immigrant literacy.

Literacy Research

Literacy is an educational issue of major public and global concern. In the last forty years, there have been more than one hundred national literacy campaigns in the world, including industrialized and newly developing countries. According to the Canadian expert on literacy Audrey Thomas (1983), what is important to recognize is that literacy is not an end in itself, it serves as a means for achieving various ends. Literacy is a bridge to economic, cultural and personal development. Thus, the eradication of illiteracy has become a goal of governments of different ideological persuasions throughout the world. The relationship of literacy to a variety of discrete individual goals and expectations is relative, and depends on the prevailing cultural, social,

political and economic context. What constitutes literacy, its definition, and measurement depends largely on its ideological context.

It is clear that "literacy is multi-dimensional and has both qualitative and quantitative aspects" (Thomas, 1983, p. 16). Literacy is a reflection of political and social realities; literacy is considered a tool for extending the power of the intellect; literacy is regarded as the necessary means for a higher quality of life; literacy is viewed as a foundation stone of all kinds of modern development (Mulira, 1975; Hunter, 1987; Thomas, 1983). It is my goal to explain these dimensions of literacy from these perspectives.

Historical Perspectives

Practices and concepts of literacy undergo historical evolution. Generally, literacy was born of the creation of the written language and developed under the condition of technological changes. The invention of the printing press, the advent of the paperback book, the implementation of universal education, the generalized use of mass media, cybernetics and space communication technology, and increasing applications of microelectronic technology have made widespread literacy possible.

Historically, literacy began as a means of serving religious needs. It further evolved in response to conditions encouraging trade and commerce, craft and industrial production, urbanization and administration (Hilliard, 1992; Thomas, 1983). In other words, the history of literacy has been a result of social development.

In the Western world, after the invention of the Greek alphabet about 700 B.C., its twin brother literacy did not experience the immediate and wide 'adoption' due to the scarceness of writing material and the poor art of script. However, literacy was diffused to a certain extent, but later destroyed along with the prosperity and fall of the classical world of Greece and Rome. Roman and Byzantine churches became the only places to preserve a literate culture from complete destruction (Thomas, 1983). People in the Church Orders were the only ones who could read and write in Greek or Latin. The clergy provided schools for religious purpose: preparing the future priests and spreading the religion.

Thomas (1983) points out that "between the eleventh and twelfth centuries, the growth of towns provided a turning point in literacy development..." (p. 33). The development of trade and industry in urbanized society necessitated a division of labour and required social literacy. The emergence of the paper industry, the invention and introduction of the printing press laid very important technological foundations for social literacy. Books could be produced in large quantity and more people began to learn

to read and write. Literacy spread from the church to trade, government and middle class circles (Mulira, 1975).

The Renaissance and Reformation in the sixteenth century provided favourable social and cultural conditions for the dissemination of literacy. Along with the increasing demands for literacy due to the spread of religion and social and economic development, public schools were set up which nurtured literacy.

However, according to the African expert on literacy Mulira, "universal literacy is very recent in human history" (p. 8). Universal and compulsory school education in the industrialized countries like Canada, the United States and the United Kingdom is little more than 100 years old. As the era advances and society develops, the concept of literacy is changing in accordance with the contexts in which it is found. Over forty years ago, UNESCO defined literacy as being able to read with understanding and write a simple statement on daily life (Amstutz, 1992). The level of educational attainment of an individual was acknowledged as an important reference to yield a proxy indicator of people's literacy levels and basic social demands for literacy. Thus, those who had four years' primary educational attainment could be considered literate. This is still true in many pre-industrial or industrializing countries; and once deemed sufficient for industrial countries; but it is no longer an acceptable criterion in a post-industrial society.

In 1962, UNESCO revised its definition of literacy,

> A person is literate when he [or she] has acquired the essential knowledge and skills which enable him [or her] to engage in all those activities in which literacy is required for effective functioning in his [or her] group and community and whose attainment in reading, writing and arithmetic make it possible for him [or her] to continue to use these skills towards his [or her] own and the community's development (p. 3)

In 1965, UNESCO developed the notion of functional literacy and made it an integral part of economic and social development. Mulira (1975) indicates in his study that functional literacy, as defined by UNESCO in 1965, includes three literal goals:

> One: learning the rudimental lessons in reading, writing and arithmetic; Two: reading follow-up books, practising writing and working harder arithmetic exercises up to the standard of proficiency; Three: follow a process of continuing education or adult education which should lead to self-improvement for life (p. 92).

In 1978, UNESCO once again revised its definition of functional literacy, which was widely accepted:

> A person is functionally literate who can engage in all those activities in which literacy is required for effective functioning of his/her group and community and also for enabling him/her to continue to use reading, writing and calculation for his/her own and the community's development (Statistics Canada, 1991, p. 53).

The latter definition is rephrased in terms of the immediate consequences of functional literacy rather than in terms of the underlying skills. It also implies that literacy is relative to space and time, i.e., context. The same person may be functionally literate at one time in one context, but not at a different time or

in another culture or society.

The criteria for literacy differ from country to country depending on social, economic and political constraints. Statistically, adults with less than elementary schooling are generally considered functionally illiterate in developing countries, while in developed countries, grade 8 is commonly used as one of the criteria for functional literacy (Thomas, 1983, Read & MacKay, 1984).

Higher criteria for literacy in post-industrialised countries is the result of their social, economical, and technological development. The Canadian expert on literacy Cairns (1983) states that, besides the criterion of educational attainment, "functional literacy may be considered as the ability to utilize effectively the communication systems of a given society at a particular time and to participate fully in the rights, responsibilities and privileges of citizenship" (p. 2). The so-called post-industrial age now seems to be entering a new 'information age' wherein large amounts of information circulate daily via the mass media, the computer and other print and non-print devices. The new, highly sophisticated information systems are so overwhelming that even the most qualified individuals find it difficult to keep up. The technological change and the transformation of communication systems have posed new requirements for the basic print literacy in advanced countries like Canada. Therefore, the working definition

of functional literacy for the 1989 Canadian National Survey of Literacy Skills Used in Daily Activities is specifically stated as "the information processing skills necessary to use the printed material commonly encountered at work, at home and in the community" (Statistics Canada, 1991, p. 14).

As pointed out by Thomas in her study in 1983, much of the printed information which is in circulation, like newspapers, journals, magazines, and documentary materials which Canadian adults have to cope with in the daily life, such as advertisements, and application forms, are written at a grade 10 readability level or higher. Besides, in today's highly technological society, the requirement for entry to most skilled jobs is at least the attainment of a grade 10 level of education. American scholar Mikulecky (1990) estimates that over 90 percent of jobs in the workplace nowadays involve regular practice of literacy, and that great amount of occupational materials are written at high school levels of difficulty or even higher.

Increasing literacy demands reflect the increased literacy ability level of the population. A literate of 1960s Canada may be a functional illiterate in 1990s Canada. It is also true that an immigrant who is highly literate in his/her native land may be functionally illiterate in the Canadian context.

It is clear that the evolution of literacy is the mirror of

social, economic and political development, and that the changing requirements for literacy reflect the demands and realities of different societies at different phases of development. Literacy use has expanded to nearly every aspect of the society. "Average ability levels have climbed..., and the complexity of literacy tasks has increased in reaction to the increased literacy sophistication of the population and the increased complexity of occupational and social tasks" (Mikulecky, 1990, p. 27).

Philosophical Perspectives

In a cultural-personal dialectic, literacy, in turn, evolves to serve as a foundation for modernization: individual, political, economic, and social. Literacy is not neutral and is never itself an isolated or absolute goal. Countries, governmental or non-governmental organizations, religious-based agencies, concerned community activists initiate literacy campaigns or literacy programs for different purposes. The purposes and practices of literacy are all inextricably intertwined with stakeholders' interests and social and political contexts. Therefore, literacy is a value-laden term and context-dependent.

The Brazilian Marxist educator and lay liberation theologian Paulo Freire's insights of the nature, the functions and the implications of literacy and literacy education is widely influential and frequently discussed in the literature. Freire has

been the leading proponent of conceptualizing literacy as a process of cultural action for freedom (Freire, 1970). According to Freire, literacy education essentially implies an orientation towards the relationship between individuals and the world. For people, orientation in the world means humanizing the world by transforming it.

Illiterates, in Freire's opinion, are neither merely undernourished, lacking the "bread of the spirit", nor merely marginal to the social structure. In reality, illiteracy is a manifestation of the "culture of silence", which is often directly related to political, religious or economic oppression. By the same token, in general, highly literate societies dominate the less literate societies. Literacy may be an essential component of colonialism/imperialism. Illiterates are often found in the dominated strata of society. They live in an implicit world and they lose their voice in the world of literacy. Giving illiterates the gift of the word will not endow them with a voice if everything else, such as personal reflection of the world, reality and social structure remained unchanged. Freire believes that the only road to humanization for illiterates as well as everyone else is authentic transformation of the dehumanizing structure from oppressive capitalism and colonialism to a Marxist humanist state.

Freire's desire for a Marxist humanist state aside, he sees the acquisition of literacy not as the passive, mechanistic or

merely participative process of receiving knowledge and skills. This type of process of acquisition is anti-dialogic and can only lead to restricted literacy--confined to a purely technical level. He claims that the acquisition of literacy should be an active and contemplative process of consciousness. This process involves thinking, reflecting and critically analyzing the process of reading and writing itself, the profound significance of language, and ultimately, the reality and the society they live in.

Since language, thought and the world are closely related, the cognitive dimensions of the literacy process must include the relationships of men with their existential reality and the world. Literacy learning experience should be an integral part of acquiring values and forming mentalities as well as the integration of the physical, cognitive, affective, and spiritual dimensions. "...reading and writing words encompasses the reading of the world, that is, the critical understanding of politics in the world" (Freire, 1987, pp. 212-13). As Luria (1976) points out, "Words ... carry not only meaning but also the fundamental units of consciousness reflecting the external world" (p. 9).

Freire's approach is based on fairly modern understandings of the nature of inner and outer speech. His philosophical roots are in Latin American Marxism, Catholic liberation theology, existentialism and modern interactionism. From his point of view, learning subjects cannot be separated from their objective world in

the adult literacy process. A synthesis between the knowing subjects and knowable objects through the authentic dialogue of the learner and the educator is required. Freire rejects the current 'problem solving' ideology and proposes the notion of 'problematising' social reality. "The educator's role is to propose problems about the codified existential situations in order to help the learners arrive at a more and more critical view of their reality" (Freire, 1970, p. 217). The learners should have their consciousness raised in the process of acquiring literacy, so as to enable themselves to analyze the historical and social conditions in which particular 'problems' arise.

Freire's position has had considerable impact on Latin American countries' literacy campaigns. It has had influence on other countries as well. However, his approach is limited by his political orientation, and his overstress on the changing of political and social structure, which is considered to be the cause of illiteracy and the culture of silence. Obviously, illiteracy is a universal phenomenon and it is a human problem occurring at various degrees in different countries in all kinds of social structures. Some socialist countries experience the serious problem of illiteracy and some highly developed capitalist countries enjoy high rates of literacy among their population. Therefore, the social structure may not indispensably be the direct cause of illiteracy as Freire believes. The process of literacy may not necessarily be connected with the transforming of political and

social structures. And the changing of the social structure may not be the only way to humanization for all the illiterates.

Besides, Freire lays too much emphasis on outer factors like social structure, external reality while he neglects one's inner factors, like personal differences and personal responsibilities to the society. The acquisition of literacy, an active and contemplative process of consciousness, should also include the realization of self-esteem, self-responsibilities and emancipation of ego in relation to the profound understanding of the world.

The American social historian Harvey Graff (1979) approaches the nature of literacy from an ideological perspective. Examining the process of literacy education for different ethnic and occupational groups in Canadian cities in the nineteenth century, Graff demonstrates that the under-class and deprived ethnic groups were virtually further oppressed through acquiring literacy. The concept of 'literacy' or 'illiteracy' was related to 'the specific context of social structural processes'. To the ruling classes, illiterates were regarded as inferior but dangerous to the social structure, as alien to the dominant culture. Without education of social values and approved patterns of behaviour, they presented a threat to the established order. Therefore, the endeavour to increase literacy rates was a political action to consolidate the position of the ruling group and the existent social structure.

As a result, the teaching of literacy in nineteenth century Canada was strictly controlled within the framework that satisfied the interests of the ruling class, with only certain consequences of literacy acquisition to be allowed.

The learners were provided no opportunity to foster their logical and critical thinking. Instead, they were being taught narrow mechanical skills of reading and writing which supported moral norms, conventional conceptions and the ideology of the ruling class.

The "Royal" readers and the "McGuffy" readers were used in all schools whether private or public. The methods of teaching reading were of the "look-say" variety, which were uniformly poor. The most pervasive feature of the readers was their moral tone and their confessional orientation to religion -- mostly Protestant.

Members from certain minorities were told that their mother tongue was inferior and was in some way correlated with their deprivation and disadvantage. Literacy appeared to them to be merely school-related reading and school-related writing, while at latent levels, it was always associated with certain social values and political assumptions. Differences of culture were to be eradicated by means of literacy and all students would be assimilated to one dominant cultural and social order. Hence, as the English anthropologist Brian Street comments, "in nineteenth

century Canada the needs and uses of literacy were constructed in relation to class and ethnicity and to their relative power positions in the context of specific social and economic structures" (p. 109).

Through his study, Graff (1979) establishes that literacy in nineteenth century Canada was in effect a practice for a larger ideological agenda: mass literacy training as a form of ideological imposition and a vehicle for cultural hegemony. He discovered that literacy did not increase social, political and economic equality and democracy, nor did it help improve the living conditions of the working class. Rather, it played a role designed to perpetuate social stratification. Graff concludes that the particular forms and practices of literacy are determined by an ideology.

Graff's ideological approach to literacy has implications regarding the nature and functions of literacy. It has been supported by evidences from different social and economic contexts (Luke, 1988). In explaining a normative agenda embodied in the transmission of literacy since the founding of state schools in fifteenth-century Germany, the German scholar Jenny Cook-Gumperz (1986) points out,

> We expect literacy to provide not just a technical skill but also a set of prescriptions. ... Literacy is not just the simple ability to read and write, but by possessing and performing these skills we exercise socially approved and approvable talents: in other words literacy is a socially constructed phenomenon (p. 1).

The link between literacy and ideology is also found in works by Allan Luke (1988), Brian Street (1984) and Bruce Bain and Agnes Yu (1987). Among those, the Canadian psychologists Bain and Yu (1987) highlight the inseparable nature of the relationship between ideology and the practice of literacy education by analyzing how Canadian ideology controlled the practice of second language education in Canada. Second language education and the practice of immigrant literacy education, in the Canadian context serves a bourgeois ideological agenda. " Language..., as Vygotsky stated, is 'a social means of perception, conception and belief'" (Bain & Yu, 1987, p. 2). The practice of second language education is another reflection of relations between social classes, genders, races, and economic power and social groups. This is evident in the issues of what to learn and how to learn it. The history of second language education in Canada is virtually a mirror of the history of the evolution of Canadian ideology.

From philosophical perspectives, we can see that the purposes and practices of literacy are value-laden. Literacy has its political, social and ideological nature. For Freire, the process of literacy education is the process of cultural action for freedom. However, as Graff, Bain and Yu note, it can be used to reinforce social control, social stratification and cultural hegemony.

Psychological Perspectives

Besides its social and political functions, literacy has important psychological and cognitive consequences. This aspect of literacy has generated considerable debate.

From the perspective of cognitive psychology, literacy is a means of altering the structure and functions of higher mental activities. The Russian psychologist, lawyer and educator Lev Vygotsky claimed that the mastery and internalization of social sign systems, especially language, both oral and written, discursive and non-discursive, play a key mediational role in individuals' psychological processes (Wertsch, 1983). Vygotsky argued that symbolic technologies--e.g., language and literacy--empower and amplify cognition out of the natural or phylogenetic line into the cultural and ontogenetic line. Cultural mediation results in an elaborated organization of 'higher mental functions' (Bain & Yu, 1991).

Vygotsky's views have received considerable support. Bruner, Oliver and Greenfield (1966) raised a similar claim "that cultures with symbolic technologies such as writing push cognitive growth better, earlier and longer than others" (p. 654). Ample evidence for Vygotsky's claim can be found in Luria's research.

Vygotsky's student, the Russian medical doctor and

psychologist, Alexander Luria conducted field studies in Uzbekistan and Kirgizia in the Soviet Union in 1931-1932 (although the findings were not published until 1974 and translated into English only in 1976). Luria studied adult subjects who differed widely in previous exposure to Russian culture and education. Some of the subjects were illiterate, non-literate and others were moderately literate. Luria and his assistants tested the subjects on various cognitive tasks, including the identification of geometrical figures, the classification of similar objects, formally syllogistic and inferential reasoning, requests for definitions of concrete objects and abstract concepts, and the articulation of self-analysis. Responses to the tasks and their ways of fulfilling the tasks were studied. Luria discovered that, non-literates' modes of thought tend to be concrete, situational and functional, based on direct contexts and experience rather than abstract, conceptual and theoretical thinking. The type of thinking which depends on a linguistic, logical mode of thought is found in literate people.

For example, illiterate subjects identified geometrical figures by assigning them the names of the real objects that they knew, such as a plate, a mirror and a door. They never gave those diagrams the abstract names as a circle, a square and so on as moderately literate subjects did. When illiterate subjects were asked to classify four objects given, like <u>hammer, saw, log, hatchet,</u> they consistently grouped them in terms of practical situations rather than in terms of categories. A 25-year-old

illiterate peasant insisted that the four objects were all alike: "The saw will saw the log and the hatchet will chop it into small pieces. If one of these has to go, I'd throw out the hatchet. It doesn't do as good a job as a saw" (1976, p. 56). But an 18-year-old subject, though only moderately literate, could classify a series in categorical terms: hammer, saw and hatchet were tools (1976, p. 74).

Luria's research shows that great contrasts exist between illiterates and literates in terms of cognition. Luria also pointed out, however, that nonliterate subjects can make valid judgments about things that concern them directly and that their kind of concrete thinking is not to be considered inferior, nor is it genetically determined. Luria believed that most of his subjects could easily shift from situational thinking to abstract thinking, the kind of thinking apparently best suited to a technological culture, after a brief training in literacy (Ong, 1982; D'Angelo, 1982).

Luria concluded that the qualitative improvement of cognitive processes is a function of literacy, and that as the thought processes are developing, they radically change perceptions of reality (D'Angelo, 1982). Luria (1976) put it in this way:

> The generalized way in which reality is reflected ... undergoes radical restructuring. The isolation of the essential features of objects and assignment of objects to a general category of objects with the same features ceases to be regarded as something minor and

> insignificant. New, theoretical thought operations arise -- analogies of the properties of things, assignment of them to abstract categories, and so forth. Thinking processes begin to involve more and more abstraction and generalization. Theoretical "categorical" thought begins to function in addition to operations of practical "situational" thinking and occupies a more prominent place, sometimes beginning to dominate human cognitive activity. Gradually we see the "transition from the sensory to the rational" ... one of the most important aspects of the development of consciousness (pp. 162-63).

As the research suggests, literacy seems to transform cognitive processes. It appears to facilitate the transition from sensorimotor and perceptual thinking to theoretical and conceptual thinking. Literacy restructures the cognitive processes and enables individuals to generalize, to draw inferences, and to perceive cause-and-effect relationships in new and different ways. In short, literacy opens the eyes and minds to a new world, a symbolic universe which was previously only dim and implicit. Literacy helps illiterate people emerge from the shadows and from the culture of silence.

Even though these major findings and claims of cognitive changes brought about by literacy have been generally accepted, some inferences and assumptions of this line of research, however, have been questioned. The American humanist Walter Ong (1982, 1984), psychologists Sylvia Scribner and Michael Cole (1981), Bain and Yu (1991) note that besides literacy, schooling also has great effects on cognitive changes, and that literacy has its dysfunctional effects on human holistic cognitive development in

positive impacts on the human cognition.

Ong (1982, 1984) provides a quite different perspective from Luria's on the relationship between literacy and cognition and difference between literacy and orality. He cites Luria's findings to illustrate the difference between the situational thinking of oral (illiterate) people from the abstract thinking of literate people. However, he questions the reliability of the cognitive tasks that Luria used for his subjects. Most of those tasks, Ong thinks, are school oriented with which an oral respondent is not necessarily familiar. Therefore, it is difficult to assess accurately the native intellectual abilities of oral people. Ong argues that the mental processes of oral cultures are not 'primitive', 'prelogical' or 'illogical,' nor are oral people essentially unintelligent.

Oral peoples created great epics like Homer's Iliad and Odyssey. For centuries, those works were falsely assumed by scholars as written compositions. Ong states that oral cultures can produce incredibly complicated, intelligent and beautiful organizations of thought and experience, though it is true that oral people think in quite different ways from literate people.

Ong (1984) further argues that "there can be no doubt that for the advance of human consciousness, for its greater actualization, writing and reading, with the interiorization they implement and

enforce, have been indispensable, absolutely required" (p.185). Nevertheless, it is the reality that once an oral person becomes literate, he loses his preliterate cognitive abilities. Literacy has to be born at the death of primary orality. Writing and reading entail 'the cultural gains' as well as 'cultural losses'. In his conclusion, Ong claims (1982),

> ontogenetically and phylogenetically, it is the oral word that first illuminates consciousness with articulate language, that first divides subject and predicate and then relates them to one another, and that ties to human beings to one another in society. Writing introduces division and alienation, but a higher unity as well. It intensifies the sense of self and fosters more conscious interaction between persons. Writing is consciousness-raising (p. 179).

It will be ideal, however, if "orality-literacy dynamics enter integrally into the modern evolution of consciousness toward both greater interiorization and greater openness" (Ong, 1982, p. 179).

Scribner and Cole's research (1981) questioned the cognitive consequences of literacy and, at the same time, showed some possibilities for the realization of Ong's ideal. Scribner and Cole conducted elaborate comparison research on three different types of the Vai literacy of Liberia: the Vai syllabic script, Arabic literacy, and English literacy. The indigenous Vai writing system used for personal and social needs is acquired in the informal settings outside school. This provided Scribner and Cole with a unique opportunity to study the effects of literacy on human cognition isolated from the effects of formal schooling.

In their study, Scribner and Cole found out that the three types of literacy systems are learned in different ways, used for different purposes and thus, produce different but important cognitive consequences. Each type of literacy, however, is not equally efficient in all cognitive domains (Bain & Yu, 1991). The style and level of cognitive skills demonstrated by Vai literates in the study is not same as that indicated by schooling. For instance, it appeared that Vai literacy facilitated explicit verbalisation skills and that Vai script associated skills were more localised than those developed by schooling. Schooling turned out to be a significant variable which contributed more to tested cognitive skills (Scribner & Cole, 1981).

Scribner and Cole's findings are considered as providing an important development in literacy studies within the discipline of psychology (Street, 1984). The implications of their findings are: (1) that the effects of literacy on human cognitive development are determined by and also limited to closely related practices, (2) that what has been considered as the results of literacy is more likely to be the consequences of the formal education, (3) that there are different types of literacy beside the type of literacy acquired through schooling. Some may be desirable for developing the integration of orality and literacy.

The recent case studies in the area conducted by Bruce Bain and Agnes Yu (1991) in the People's Republic China provide a wealth

of support for Ong's position. Bain and Yu also question the cognitive amplification hypotheses. Bain and Yu studied the cognitive abilities of adult male subjects, Qin, Han and Huang, three peasants in rural China. The three subjects, two literates, one nonliterate, were tested by recalling the text of the Lonesome Opossum the next day after they learned the text and again three months later. The purpose of the study was "to determine the influence of acquired cognitive structure on text reproduction" (Bain & Yu, 1991, p.867). All three fully recalled the text the next day no matter how they had been presented the text. Three months later, the two literates missed many details, propositions and a number of themes of the tale, while the nonliterate was able to recall the entire tale. What can be deduced?

On the analysis of the subjects' text reproduction, Bain and Yu argue that the experience of literacy enables literates to organize and structure narrative forms internally along thematic lines, but this same process also results in loss of details of substructures. Nonliterates lack the ability to abstract and classify in the literate manner, but reproduce the text completely. "The absence of this type of cultural amplifier nonetheless serves the social purpose of maintaining the integrity of the whole tale" (Bain & Yu, 1991, p. 872).

Bain and Yu's results of the case studies suggest that literacy not only has its limits in certain aspects, but also has

dysfunctional effects on holistic cognitive development. Huang, nonliterate, outperforms the other two literates in text reproduction because he has not yet acquired amplified cognitive structures. On the other hand, Qin and Han, in the process of becoming literate, have lost their preliterate cognitive strategies. Bain and Yu suggest the views of Vygotsky (1978), Luria (1976), Bruner, Oliver and Greenfield (1966) on literacy and cognition are perhaps too optimistic, thus supporting Ong's contention of a need to develop oral and literate forms. Though symbolic technologies do push cognitive growth earlier and longer, the result is not necessarily always better. Bain and Yu (1991) propose a dialectic theory of practice of literacy which while consistent with Ong's, also extends Ong's position:

> do not throw out the baby with the bath water... Why not find ways of maintaining and furthering traditional modes of cognition as a complement to literate modes of cognition? We have the resources to find out how nonliterate experience captures various types of cognitive problems. The problem would then become one of finding ways of gaining the systematization and abstraction abilities which derive from literacy without losing the holistic character of nonliterate experience. Functioning with oral syntax and literate syntax in harmonious relations may result in more unified cognitive dynamics than seem possible by means of oral or literate syntax alone. Do mind and society not need Euclid and Homer? (pp. 874-75)

In summary, the debate on the effects of literacy on cognitive process suggest it is impossible to deny that literacy does have significant effects on cognitive development and consciousness. Many aspects of the cognitive impacts of literate competence,

however, may in reality be the results of "the conflation of the effects of schooling as a socialization and literacy educational process with the effects of literacy per se " (Luke, 1988, p. 14). Literacy and schooling empower literates to think in logical and linguistic modes and to reflect on reality in a different, more abstract way. However, the impact of literacy is not as perfect as some believe. The consequences of literacy are construed by social contexts and different purposes and uses. There even seems to be some dysfunctional consequences of literacy through formal schooling: we lose some very valuable oral properties of human cognition. In fact, there exist other types of literacy besides school literacy, which provide possibilities of producing different desired cognitive consequences. The aim of the practice of literacy and literacy education should be to find an appropriate way in order to achieve a wiser rhythm in the ways of Homer and Euclid.

Sociological Perspectives

Sociological perspectives of literacy encompass the ideas and views on social functions of literacy on the life-styles of people, the quality of the workforce, social mobility, economic advancement, and such like. The relationships between literacy to wealth and poverty, literacy and employment are crucial and controversial issues in the sociology of literacy domain.

To promote individual, economic and social development is

often considered the primary purpose of literacy. Many literacy educators believe that by increasing ability to read, write, and think, individuals can greatly develop their potentials and capabilities needed in a modern technological life. As a result, they are, theoretically, able to increase social mobility and economic circumstances related to higher educational levels. On the community level, it is also believed that different groups of people such as ethnic communities and economic classes can increase the social standing of their group as a whole when the group enjoys a higher level of literacy (Amstutz, 1992). Hence, literacy has been viewed as a prerequisite to the economic and social well-being for individuals as well as for an entire community (Rose, 1992).

Many critics and scholars do not agree that literacy is the key to social mobility (Fingeret, 1991; Anstutz, 1992). They think these arguments ignore the realities of social class and social structure and also ignore the complex web of forces contributing to the economic and social problems of a society. The purposes of some literacy programs, they argue, are not really to empower the people who are poor and disenfranchised, but to support the maintenance of the present distribution of wealth and power. By providing limited and highly specific job training, literacy programs, if they ever can, enable adults to fit into the existing niches in the workplace (Fingeret, 1991). They still remain at the bottom of the society. Becoming literate only helps them enter primary employment while it hardly raises their social status.

It is true that when we analyze the social functions of literacy, we can not discuss them independently from social forces and social context. Literacy may have impact on social mobility to a certain extent; however, the variation of social mobility is more likely to be controlled by social and political conditions. China is a good example. Literacy in China had long been regarded as cultural capital for the ruling and middle classes. After liberation, Mao claimed that the exploiting classes had been eliminated in the new China, and that the working people would become the masters of the new China. They had the right to have access to literacy and education in order to function within the society as genuine masters. On the social level, the social status of the lower classes was raised, not because of literacy, but because of the change of the society. Though people with higher levels of literacy were still respected, they were often regarded as petty bourgeoisie and were the objects of reformation.

During the Cultural Revolution, Mao directed a national cultural tragedy in China. The higher the level of literacy one had, the more one was to be despised and the lower the social status one would have. The working class was the leading class while the well educated people were deemed reactionary. In those times, many intellects, teachers and professors, were driven out of their positions, and assigned to do menial labour. Being literate, especially highly literate, was regarded as a sign of decadence. Many young people worked in factories to be a member of the leading

class rather than to go to high school and risk being seen as decadent.

After Mao passed away in 1976, the situation changed dramatically. When Deng became the leader, he decided to promote education and literacy in order to advance economic and social development. Literacy was restored to its rightful place. Well educated people began to enjoy higher social status once again. The social trend made it possible for young people to prefer to finish high school and make every effort to enter universities. Literacy level positively influenced social mobility in this era in China, thus illustrating the point that the value of literacy is context dependent. Nonetheless, literacy and literacy education do present the possibility of mobility especially when social and political conditions appear to be favourable.

Literacy is also viewed as a road to wealth and economic development. It is commonly claimed that illiteracy is linked with poverty, disease and underdevelopment. If we draw a literacy diagram of the world, a diagram of economic income per capita, and a diagram of gross national product to compare them, it is easy to see a strong positive correlation between literacy and wealth and social development. The countries which are rich, economically and highly developed are always the countries with higher rates of literacy. Likewise, the countries which are poor, economically backward are always the countries with lower rates of literacy.

Because of a literate population, Japan and West Germany witnessed high and speedy development in technology and economy. In contrast, countries with high illiteracy rates are hindered in their efforts to modernize. Because such countries also tend to have high death rates, as Mulira (1975) points out, "This clearly shows that illiteracy, poverty and disease go hand in hand". Poor health is virtually the result of combined effects of illiteracy and poverty, lack of health knowledge and lack of medical care. Therefore, it is believed that literacy education should be made an opportunity for acquiring competence and information that can immediately be used to improve living conditions and standards (Unesco, 1976). Functional literacy training is therefore particularly needed for illiterate adults so as to bring about a mental and cultural change, which "will lead to an economic and social change, hence true development" (Mulira, 1975).

When it comes to individuals in a particular society, however, the picture of literacy and wealth, illiteracy and poverty may not be the same though the superficial appearance could be similar. It shows that those who are illiterate are also most commonly impoverished. A close scrutiny reveals the secrets and the true causal relations of illiteracy and poverty. As Freire (1970) points out, most illiterates are poor not because of their illiteracy, but because they belong to the lower and dominated strata of the society. The lower social status and economic poverty deprive them of the opportunity to learn to read and write, and hence keep them

away from participating fully in social life as a valuable citizen. Illiteracy can be regarded as a twin brother of poverty born of lower social status. For illiterates living in poverty whose basic needs for food, water, shelter, clothes can hardly be partially satisfied, the motivation, the energy and the time needed for learning to read and write are most likely devoted to the struggle for survival each day. Illiteracy, then, becomes an additional factor to keep illiterates in the low social statuses and poverty. This social phenomenon cannot be totally altered by the practice of literacy per se if other conditions remain unchanged.

Based on his study on the nineteenth century Canada, Graff (1979) challenges the old beliefs about the relationships of literacy to wealth and poverty. In his study, Graff discovers that in some places, there were not many illiterates among the poor. For instance, "of all the poor in Hamilton in the 1861 census, only 13% were illiterate" (p. 84). It is not reasonable or convincing to attribute poverty to illiteracy, when most of the poor were literate. Besides, Graff found that certain ethnic groups were disadvantaged, regardless their literacy rates. "Among the Irish Catholics, the largest and poorest group, literacy brought little benefit; 65 % of the literate and 76 % of the illiterate were poor" (pp. 86-7). Being literate did not make much difference (only 11 %) to being poor for this disadvantaged ethnic group. "The disadvantages with which ethnicity and race confront these groups were simply too great for education to reduce significantly, or for

illiteracy to handicap much more" (p. 87). But the distribution of poverty among literates and illiterates was distinct among groups advantaged over others, like English groups, even though the illiterate in those groups gained more through their origins in terms of wealth than other illiterates. This indicates that only when other conditions are equal does literacy act as a determining variable. Graff then claims that the primary cause of poverty was ethnic origin rather than literacy with regard to nineteenth century Canada, and that social stratification also varied with age, gender, and ethnicity rather than with levels of literacy (p. 91).

Graff concludes that literacy is not an independent determining variable among other factors such as migration patterns, social origins, wealth, employment, and family formation when levels of literacy achievement are compared with those factors. Literacy serves to mediate these primary processes and interacts with them. From his study of nineteenth century Canada, literacy proved not to be sufficiently powerful to overcome the prejudice of age, gender and race, concerning job opportunity. Once again, certain ethnic groups were advantaged over others no matter what their literacy rates were. The result shows that it was not because one was illiterate that he/she ended up in the worst jobs with the lowest pay, but because of one's ethnic background. Ethnicity turned out to be the significant independent variable rather than literacy in determining one's job opportunity as well

as one's wealth.

Though Canada has undergone great social, political and economical changes since last century and has developed into a democratic and highly industrialized country, what was found a century ago is still true to a certain extent in today's Canada. However, literacy, on the other hand, is playing a more and more important and powerful role in determining one's ability to compete in the job-market and in turn, that will affect one's economic conditions.

Due to the transformation from primary production to automation, lots of manufacturing jobs have vanished and simple manual and menial jobs requiring minimal level of literacy are becoming fewer. Millions of new jobs have been created in information systems and service areas, and they require a high level of literacy. The higher requirements for literacy in the workplace keep illiterates from getting those jobs (Lloyd, 1992). Though increasing the literacy level of individuals cannot create additional jobs and new job opportunities, it can help individuals raise their ability and competence so that they can qualify for jobs with adequate pay. In this way, the possibilities are considerably increased for the new literates to enter or reenter the workforce and to get better jobs.

Moreover, literacy is generally viewed as a motor of economic

advancement for a country. It is revealed in the 1989 Canada National Survey of Literacy Skills Used in Daily Activities that 30% of the workers in service producing industries (which are more heavily information-oriented than other industries), and more than half the workers in farming and other occupations in the primary industries as well as in the manufacturing, personal services and construction industries, are found not to have sufficient reading skills to meet most everyday demands. The deficiency of literacy in the workforce has proved to be a serious hurdle to the development of productivity and the economy (DesLauriers, 1990; Lloyd, 1992). Firstly, literacy deficits prevent the workers from carrying out work-related assignments and instructions accurately and effectively, which results in lowered productivity. Secondly, lack of literacy skills hinder the introduction and implementation of new technology and new means of production, which increases the cost of training and retraining of the workers and reduces competitiveness.

The Canadian scholar DesLauriers (1990) notes that since technology advances rapidly, production methods and product lines have to be altered swiftly in order to meet the demands of the productivity and competitiveness of business. Very few of these changes and innovations can be introduced without significant training or retraining of the workforce, the most important component of productive forces. Literacy is apparently the prerequisite, as the production-related training can hardly be

carried on if the trainees do not have the necessary reading, writing and numeracy skills. The findings of the study conducted by DesLauriers (1990) on the impact of illiteracy on the productivity and competitiveness of Canada business show that many companies and employers provide both technical and literacy-related training programs due to the literacy deficits in their workforce (pp. 2-3). It has also been shown that functional literacy training is an necessary and effective means to improve the quality of the workforce and increase industrial productivity.

Increasing literacy levels by itself does not guarantee wealth, employment, productivity, social mobility and better life conditions. This is because those variables are also controlled by more powerful political and social forces. Nevertheless, literacy can empower individuals to strive for better and enriched personal and collectiv lives.

Immigrant Literacy Research

Immigrant literacy can be seen as a branch of general literacy research. Although most of the principles and theories in literacy apply to the research, yet, immigrant literacy has its own special properties and characteristics that are worthy of special theoretical study and research.

The study of immigrant literacy has become extraordinarily necessary, since for the last two decades, Canada has witnessed dramatic change in immigration trends. More and more non-English or non-French speaking people have immigrated to Canada. In the 1989 Canada National Survey of Literacy Skills Used in Daily Activities, it was reported that there were nearly two million Canadian adult immigrants whose mother tongue was neither English nor French (Statistics Canada, 1991). Canada has developed into a nation with high ethnic diversity. Immigrant literacy in one of the Canadian official languages has become a public concern and a ticklish issue. Unfortunately, there is not much literature available in this area. Therefore, it is hoped that this research can shed some light on the problem.

As noted in Chapter One, the term "immigrant literacy" has peculiar implications. In this thesis, what I am going to focus my discussion on is the functional literacy of the foreign speaking immigrants in either English or French.

The following discussion concerns the issues of immigrant literacy as seen from two perspectives: cultural perspectives and political perspectives. These perspectives are generated from the properties of immigrant literacy.

Cultural Perspectives

Immigrant literacy in one of the official languages is essential for immigrants to start a new life in Canada. Besides learning how to speak either, or both languages, immigrants must learn how to read and write English or French, lingua communis, so that they can communicate with other Canadians effectively, find jobs and work productively usually under the supervision of a non-immigrant boss, consume and enjoy what is being offered by the society and participate fully in the societal life. Otherwise, by losing their 'voice', they will be disenfranchised and submerged into the culture of silence, no matter how competent they are in their native languages and what expertise they have.

Immigrant literacy, or immigrant functional literacy, does not simply encompass the knowledge and skills in language and numeracy. Functional literacy is a kind of contextual literacy which "refers to people being able to function within the context in which they live and work" (Amstutz, 1992, p. 17). As the context in which the immigrants live and work has changed dramatically in most cases, cultural differences and conflicts are one of the major concerns of immigrant literacy.

In order to be accepted as equal members in Canadian society and participate fully and function effectively in the Canadian social, cultural and economical contexts, immigrants have to

overcome not only linguistic, but also cultural, and social obstacles. The cultural and social obstacles are much more problematic if immigrants are 'functionally illiterate' in both of the official languages. Their little knowledge of the Canadian cultural and social contexts puts them into an even worse circumstance than that of the Canadian-born illiterates. They must learn about the Canadian culture in which functional literacy is embedded. On the other hand, literacy in one of the Canada's official languages is the prerequisite and means of the cultural integration for immigrants. Therefore, the cultural transition becomes an integral and indispensable part of the process of immigrant literacy.

The practice of immigrant literacy cannot be separated from its historical and political-ideological context (Bain & Yu, 1987). There have been two different positions in the cultural transition in immigration and immigrant literacy: cultural assimilation and cultural pluralism (Beck, 1975; Lambert, 1975; Bain & Yu, 1987; Economic Council of Canada, 1991). These two positions are based on two distinct assumptions about ethnic and cultural diversity. The assumption behind cultural assimilation is that diversity is a negative and undesirable value which threatens the social control of the dominant group. Therefore, the practice of immigrant literacy should aim at eliminating the cultural and ethnic differences between immigrants and non-immigrants as quickly as possible so as to maintain the prevailing cultural-economic

hegemony. The immigrant literacy programs are then presented as the process of Canadianization based on the concept of and belief in forced cultural assimilation.

According to the assimilationist thesis, in order to be accepted in the host society, immigrants have to forsake their own cultures and languages as they are of low prestige and are even barriers to immigrants' assimilation. At the same time, immigrants should, through the process of cultural assimilation, progressively assume the characteristics of the native-born.

But one psychological principle underpins the cultural assimilation of the immigrant literacy education: one will not absorb a body of cultural information until one is willingly prepared to do so. The fundamental cause of the literacy crisis is the unwillingness, resentment or the inability of immigrants to change cultures (Winterowd, 1989).

History has showed that forced cultural assimilation puts immigrants in a forced inferior status. On the one hand, such a practice leads to low self-esteem which has negative consequences for literacy; on the other hand, it would no doubt generate discrimination and ethnic tension. Therefore, such cultural assimilation would only replace ethnic diversity with ethnic conflict. Studies in various countries also suggest that the process of convergence seldom occurs in practice without negative

results (Richmond & Kalback, 1980). As Bain and Yu (1987) clearly state, "Nations based on a singular criterion such as language or race or religion or ethnicity are dangerous anachronisms that appeal to base emotions" (p. 3).

Contrary to assimilation, cultural pluralism is based on the assumption that ethnic and cultural diversity is a positive value. The difference is not something to fear, punish and victimize but a desirable dynamic to bring about change and development. "Modern social democracies--like language and gene pools--require a constant influx of new life to keep them vital" (Bain & Yu, 1987). The premise that distinctive subgroups exist within a society is an advantage to all. They provide a richness of foreign cultural heritages, a different set of values, different social and economic experiences, new life-styles, and a variety of sources of pleasure: Chinese cooking, Italian pizza, Austrian music, Japanese brush painting--'the spice of life'. All of these are doubtlessly making imperceptible changes in the quality of life in Canada. This assumption from a social perspective forms the ground work for cultural pluralism.

Another assumption of cultural pluralism comes from a psychological perspective. It is supposed that given the reassurance and the recognition needed to strengthen the cultural roots and background of the immigrant, he/she will develop a strong positive self-image that makes him/her proud of his/her heritage

culture and language. That in turn can help the immigrant identify voluntarily with the host culture. Hence, the immigrant is more likely to gain the best results of literacy training, both linguistically and culturally. Eventually, he/she will 'ideally and hopefully' feel at home in his/her own community as well as in the broader Canadian society and make the best contribution he/she can to the societal life and his/her new country (Caccia, 1975).

Therefore, immigrants should not abandon their cultural identity in order to be accepted in the host society, nor preserve the differences which are not compatible with Canadian customs. They need to make positive cultural transition or adapt their heritage culture to the host culture, making a valuable addition to both (Lambert, 1975).

Theoretically, cultural pluralism is an appropriate policy for promoting immigrant literacy in Canada. It is believed that cultural pluralism can help immigrants overcome "cultural shock" and "cultural conflict" by facilitating a positive process of adjustment to cultural and social Canadian realities. Cultural pluralism can also provide a favourable environment for immigrants to learn the language as well as social traffic rules, to reflect upon Canadian social values, cultural and political issues. Most important of all, cultural pluralism can avoid racial discrimination to a great extent through its promotion of mutual accommodation. Hence, it brings peoples with diverse ethnic and

cultural backgrounds into a nation of harmonious unity.

Practically, however, these beliefs have proved to be too naive and optimistic. There is no doubt that cultural pluralism is the more advantaged strategy compared to cultural assimilation (Beck, 1975; Caccia, 1975; Lambert, 1975; Economic Council of Canada, 1991). In reality, however, it has not brought about all the expected consequences. Bain and Yu (1987) seize the point at issue by stating that cultural pluralism is only possible when different social and ethnic groups live side by side with no group being dominant in all spheres or almost all spheres.

Daniel Moynihan, of the U.S. Senate, and Nathan Glazer, a professor of sociology, (1970) provide a distinction which has significant application in the Canadian context. That is the distinction between cultural assimilation and cultural pluralism; and, economic integration and economic disenfranchisement. Bain and Yu (1987) reveal that though it may be possible for both the majority and minorities to agree upon the importance of cultural pluralism in a nation, there are always disputes about and conflicts on how to bring about a genuine economic and institutional integration. It is often the case that immigrants can be allowed to maintain their own cultural identity, but it is hard for them to achieve structural integration: to be accepted as participatory and equal members in Canadian society. Many of them are kept socially marginalized and economically disenfranchised. As

a result, the supposed sociological and psychological effects of cultural pluralism are greatly restricted and limited.

In effect, true cultural pluralism can never be realized without institutional integration. Thus, the process of immigrants' cultural transition cannot be studied independently from the process of structural integration in terms of immigrant literacy research. These two processes are both distinct from each other and complementary to each other. Literacy plays an important role to mediate these processes and interact with them. These issues lead to the following discussion: political perspectives of immigrant literacy.

Political Perspectives

Immigrant literacy is the human right of every immigrant entering Canada for his/her cultural and institutional integration. That is to say that every immigrant is entitled to get access to the immigrant literacy programs to meet his/her linguistic, social and cultural needs.

Unfortunately, many of immigrants are barely aware of that right. When they arrive in Canada, a lot of them are just so busy settling down in the new country that they do not give the issue careful thought. After they settle down, many of them have to work

immediately to support their families. They often find themselves without time or energy to go to language schools even though they realize that becoming literate in one of the Canadian official languages is highly necessary. Besides, they are often not well informed of what kind of services are available to them and what type of immigrant literacy programs are offered to them and where. Many assume that their official language deficit is their personal problem and they have to solve it by themselves. Some of them even feel they are losing face by going out asking for help. This is especially so if they cannot speak much English or French.

Instead, faced by survival needs, many immigrants have to go out to find jobs without substantial training in the language. Hence the jobs they take are often unskilled or semi-skilled, regardless of work experience in their homelands. Many professionals, highly skilled workers as well as unskilled immigrants start their career in Canada by working as manual workers. This is the case of many new Chinese immigrants I have known in St. John's, Newfoundland. While the economy was bad, experienced teachers, engineers and researchers had often to work as cleaners, dish-washers, or baby-sitters because of their low language skills. Their experience in China could not help them at all in acquiring a job, and their educational background and degrees did not count much because their literacy skills in English were too limited to allow them to function effectively. This may be regarded as one of the most complicated cases in immigrant literacy

in one of the official languages. On the one hand, these Chinese immigrants had reached the highest literacy level: technical literacy, in their mother tongue; on the other hand, they had merely arrived at the basic or survival literacy level in English. Lack of the functional literacy in English, the necessary bridge to higher level, their technical literacy in their native language would not likely be transferable.

When their basic survival needs were satisfied after a year or two, many of them decided to go to ESL programs to learn English. To learn just how to speak English was not their aim. Their aim was to aquire literacy in English. Lack of functional literacy in English appeared to be the highest and the most difficult barrier for many of them. Hence, literacy in English was regarded as the most important and possible means to increase social mobility to them. They believed that by increasing their literacy level in English they could increase their ability to compete on the labour market and thereby raise their social status. However, after they obtained the certificate from the language schools, they found out that it was still impossible for them to get opportunities in their own professions to use their training. Their educational background did not have high credit because that was from another culture.

In order to find a job in their previous fields, a Canadian degree was critical. Therefore, they had to go back university for another degree, even if they had one or two already. They must have

another Canadian "visa" to re-enter the professions in which they had expertise. In the meantime, because for several years they had not worked in their own fields, some of them could well lose their skills and expertise, and would be unable to keep up with new methods and techniques. In effect, their previous training was being wasted. There was a need for them to go back university. But, what would happen to them after they obtained their Canadian degrees? The survey of some Chinese immigrant students I did in Newfoundland indicates that it is possible for them to find jobs, having had Canadian degrees. But, compared with other Canadian classmates, for one reason or another, they were still disadvantaged. Usually, they had to have higher qualifications than their competitors in order to get the same type of job. Many of them had to continue studying for higher degrees, having failed in finding jobs in their training fields.

This example of new Chinese immigrants may reflect the common phenomenon for a lot of immigrants who were professional or technical workers (Ferguson, 1978). And the experience of Chinese immigrants , to some extent, demonstrates Graff's claim that one's ethnic background may play a more important role than literacy in dertermining one's job opportunities as well as social status. It also supports Mikulecky's (1991) conclusion regarding the implication of literacy use, "because literacy use and purpose are so closely linked with racially segregated social contexts and networks, a heavy potential exists that literacy may be used

inappropriately for discrimination and gatekeeping" (p. 29). Literacy in one of the Canadian official language sometimes is used inappropriately to serve as a screen to hide subtle racial discrimination, keeping immigrants disenfranchised, cutting them off from enjoyment of real equal opportunities for employment and wealth.

Cultural pluralism is indeed a much more progressive policy than cultural assimilation. However, it will be an empty framework if it is not carried out with substantial institutional integration. Cultural pluralism without structural integration permits cultural differences but bolsters social class differences as well. Most immigrants enter the social system on the lower rungs of the ladder, with comparatively low occupational status. Literacy in one of the Canadian official languages is supposed to be an effective means to enable them to climb up the ladder. Unfortunately, racial discrimination and prejudice may make use of literacy to keep them at the bottom or lower ranks of the social hierarchy. As for the economically well-to-do immigrants, literacy is not a gatekeeper as long as they can earn big money by engaging in business. They retain the social status they have had regardless of being literate or illiterate in English or French. Under such circumstance, socioeconomic background may have great impact on literacy but not vice versa.

Multiculturalism aims at providing equal opportunities for

different cultures. However, genuine cultural pluralism cannot be expected unless a genuine institutional integration is brought about. It is clear that "race is only skin deep, but it poses unrelenting difficulties for some people" (Yu, 1991). Many immigrants, especially the target population of this study without English or French background, are in a disadvantaged position. Literacy therefore can and should be a positive means to help them instead of keeping them deprived. All the progressive social forces should work to that aim. Canada, one of the leading nations for attracting immigrants with diverse linguistic and cultural backgrounds, should also become the leading democratic nation, promoting equality of opportunity regardless of race or gender.

Variables Which Influence Immigrant Literacy

From the previous discussion on the properties, functions and uses of literacy, it is shown and repeatedly emphasized that literacy is context dependent. Thus, the cultural, social and political contexts of immigrant literacy in one of the Canadian official languages have been studied. Since this study is designed to investigate the demographic antecedents of immigrant functional literacy, plus the independent effect of literacy, in a covariance model, on earnings, the following discussion, then, will focus on the specific personal and contextual variables in the context of the two basic models: demographic and socioeconomic. The variables

have been chosen among the ones which are availabe in the Survey of Literacy Ability Used in Daily Activities. They are assumed to be independent variables in the models and they are expected to have effects on adult immigrant literacy abilities and achievement as well as on income.

Ample evidence has been found in the literature to support the choice of the variables and theory relevant to the research models. I will elaborate on some of these variables in the two basic models in relation to the relevant theory and research.

Personal Predictors

Age and gender. Age and gender are always considered as basic variables in a demographic model. Because so many social and economic characteristics are age and sex related (Richmond & Kalback, 1980), many of the differences between immigrants and their literacy competence are expected to be related to differences in their age-gender structure. It is generally believed, for example, that older foreign speaking immigrants (55-69 age group) will have less literacy ability in English or French, even though some of them have been in Canada for quite a long time. Further, immigrant women are usually found less well educated and seem to experience greater difficulties than men in learning English or French (Read & MacKay, 1984; Boyd, 1991).

Period of immigration. Period of immigration refers to the actual period of time immigrants came to live in Canada. Given the importance of time in the literacy process and exposure to either English or French in the authentic context, the period of immigration becomes an important control variable in the study. Two major changes may be reflected in the characteristics of immigrant literacy ability by period of immigration: "a) changes that occur primarily as a result of the passing of time and the accumulation of educational, work and other experiences; and b) changes in the characteristics of the immigrants arriving in Canada" at different periods of time (Richmond & Kalback, 1980). The recent immigrants who learned English or French only recently are likely to be found disadvantaged by a limited knowledge of an official language (Statistics Canada, 1991).

Social Context Predictors

World regions of origin. World regions of origin refers to country of birth. The data in geographic terms, available in this LSUDA category, are provided in world regions instead of specific countries. Country of birth is of primary importance in identifying immigrant population and the composition of the target group in addition to the mother-tongues (Read & MacKay, 1984). It may also have effects on the variation of immigrant literacy abilities and achievements. According to 1989 UNESCO data on illiteracy rates around the world, certain world regions have very high rates: Asia,

75 percent of the total; Africa, 18 percent; Latin America and the Caribbean, 5 percent; while the industrialized countries only have 2 percent (Amstutz, 1992). The data here only refer to those who are unable to read and write, and do not include functional illiterates. Immigrants from those source regions will inevitably bear some of the literacy characteristics of the regions. Read and MacKay (1984) found that immigrant educational levels, which are considered to be the criterion for literacy, appear to be at two extremes. At one end of the spectrum, some immigrants from certain areas tend to be highly educated; at the other end, those lacking formal education from other areas will tend to need a great deal of official language and literacy training to facilitate their functioning in the host country.

Province of residence. "The official bilingual and multicultural nature of Canadian society and the immigrants' increasing preference for settling in Canada's largest metropolitan centres provided the rationale for the choice of geographical areas of residence" (Richmond & Warren, 1980). Previous research on literacy shows that province of residence is a powerful indicator which reveals high variability of literacy rates among provinces (Thomas, 1983; Calamai, 1987; Bulcock, 1992). It is assumed that province of residence may yield similar results for the differentials of immigrant literacy ability and achievement due to the difference in city environment and in opportunities of literacy programs.

Educational Predictors

Parental education. Parental education is one of the most powerful predictors in educational research (Clifton, Williams & Clancy, 1990, 1991). The notion that home environments play an important role in individuals early literacy development has been supported by several studies (Sibold, 1992). Parental education, especially mother's education, has proved to have significance in accounting for the outcomes and literacy of their children. It appears that higher the parental education levels, the higher the expectations they will have from their children and the more favourable home environments they will provide for the younger generation. As a result, their children are more likely to gain higher level of literacy. According to Finn (1986), "parents are their children's first and most influential teacher" (p. 7). Parents provide children with rich experiences which help children develop their attitudes, interests, and foundations for learning and literacy. Children usually need adults to share their literacy heritage to lead them into literacy. On the other hand, like literacy, illiteracy is intergenerationally transmitted within families (Sibold, 1992).

Education before entry. Education before entry refers to the highest level of education received in the immigrant's native countries before they emigrating to Canada.

There are two rationales for this. Firstly, level of literacy has a strong and positive correlation with level of education. As noted above, the educational attainment has been used as one of the methods of measurement to estimate literacy levels in general. That is one of the measuring devices suggested by UNESCO and has been one of the major measurements for most of the researches and studies conducted on the analyses of literacy and illiteracy. It is obvious that data of the educational attainment of the population cannot be the only yardstick to measure literacy levels. This is because: 1) there are cases in which people, though in the category of less than criterial educational attainment (grade nine), actually have achieved the equivalence of that level of education or higher through self-education and life experience. 2) there are also examples in which some have attained a certain grade of education, but may not have acquired the equivalent knowledge and skills due to personal and school differences (Thomas, 1983). Therefore, the accuracy of the outcomes on the actual level of functional literacy based only on the data of educational attainment of the population is questionable. Nonetheless, the recent studies still indicate with strong evidence that education attainment is a powerful predictor accounting for literacy levels (Thomas, 1983; Read & MacKay, 1984; Calamai, 1987; Statistics Canada, 1991).

Secondly, the immigrants with good educational qualifications may have better oppotunities to further their education in Canada.

As a result, they may have higher level of functional literacy in one of the Canadian official languages. Besides, some immigrants who had certain levels of education before they came to Canada had some exposure to English or French in the schools of their native countries. For example, English is a compulsory course in secondary schools, colleges and universities in China. Therefore, those immigrants have gained certain reading and writing abilities in either English or French which will definitely facilitate their learning and functioning in that language after they immigrated to Canada.

Education in Canada. Education in Canada means the highest level of education received in Canada. For both language and social reasons, this variable is expected to be a strong predictor. Receiving an education in Canada is obviously the best and most efficient way leading to functional literacy or a higher level of literacy in one of the official languages. Learning is effective because it takes place in the Canadian context with the most suitable language environments and literacy skills learned can be applied to the real life immediately. Calamai (1987) concludes that "schooling in Canada is much better for reducing illiteracy (in one of the official languages) than schooling elsewhere" (p. 22).

Language Predictors

Literacy competency in the first language. Literacy ability is believed to be transferable from one context to another. If the immigrant has adequate mother tongue competency, it will be easier for him/her to acquire functional literacy in a second language. It has long been believed that acquisition of literacy in the second language is dependent on the first language development in the school context (Vygotsky, 1928). This is because he/she has already internalized functions of language and possesses the common characteristics of a literate.

Age when starting learning English or French. This variable is a dominant factor in acquiring literacy abilities for the target population. All previous research indicates that "the age when one of Canada's official languages was learned plays a key role in the development of reading skills in that language" (Statistics Canada, 1991). The foreign speaking immigrants who started to learn one of the official languages before age of 15 have significantly higher rates of functional literacy than those who began to learn English or French after age of 15. Penfield and Roberts (1959) state that a child's brain has a specialized capacity for learning languages while the brain of the adult, however effective it may be in other directions and domains, is usually inferior to that of the child as far as language is concerned. The physiological reason for that is that there is a biological clock of the brain of human beings in

certain domains. Certain capacities of a child's brain are superior to those of an adult's, and they decreases with the passage of year. The second reason for the difference of language learning between a child and an adult, according to Penfield and Roberts, is the psychological urge. A child learns a new language as a method of learning about life, and he/she learns it through the direct method. An adult learns a new language with a conscious purpose through the means of his/her mother tongue, which is the indirect method. Therefore, a child usually appears to be more successful language learners than an adult.

Language spoken at home. It is assumed that if immigrants speak one of the official languages at home, their literacy level in that language will tend to be higher than those who speak their mother tongue at home. Though immigrants can choose to speak either one of the official languages at home or their mother tongue in the multicultural Canada, it is believed that it is better for them to speak either English or French so as to raise their level of literacy in the official language. In the findings of the Southam survey in 1987, Calamai (1987) points out that "English spoken in the home or learned before starting school consistently produces higher literacy levels than French or all other languages", though he notices that "this finding is coloured by the high illiteracy rate among older French Canadians and older immigrants" (p. 22). Therefore, language spoken at home will be an interesting variable to test if it is statistically significant in accounting for

literacy achievement in the language.

Language spoken outside the home. It is believed that if immigrants speak English or French outside the home most of time, their literacy level in that language will tend to be higher than that of those who only or most of times speak their mother tongues. The indicator is that the more exposure to one of the official languages and the more involved in the language environment, the higher level of literacy in the language will be. The simple reason is that language learning, and in particular language knowledge, is the product of the social and cultural contexts. This has been echoed by many of the researchers in the field such as Roberts (1959), Harris (1982), and Olson (1983).

The Socioeconomic Predictor and the Dependant Variable

Occupation. Occupational achievement of the target population has been a central concern in the study of immigration (Richmond & Kalback, 1980). It is also an indispensable variable in research in literacy and immigrant literacy (Thomas, 1983; Read & MacKay, 1984; Statistics Canada, 1991). The variable provides an index of the social status of immigrants. As different occupations have different demands for literacy, differential effects on immigrant literacy ability and achievement are expected.

Income. The earnings of immigrants is a dependent variable in

the study. It is an important indicator which is expected to reflect the effects of demographic and socioeconomic variables as well as the effects of literacy ability and achievement. It can be tested whether literacy, or ethnicity, or other factors are the more powerful predictors in determining immigrants' living standards. It may provide cogent proof in support of certain arguments and claims discussed earlier.

The above discussion on the variables of immigrant literacy will be the guideline of the research. Hopefully, the analyses and results will yield findings and evidence to give support for the several theories discussed in this chapter.

Conclusion

The related literature on literacy and immigrant literacy supplies a wealth of theories to the research on immigrant literacy. From historical perspectives, literacy is the product of social and historical contexts. The concept and definition of literacy has been in the process of change along with the social, political and economical development. The criteria for literacy also vary in accordance with time and space. Although literacy is a controversial issue in different domains, it is clear that literacy is never a neutral term; there is always an ideological agenda included in the process. The process of literacy practice

can be a cultural action for freedom, and it can also be a means of reinforcing social control, social stratification and cultural hegemony. As far as the functions of literacy are concerned, literacy is often considered as a foundation stone for human development, both psychologically and sociologically. However, its functions have always been controlled and determined by social and political conditions. It is also worthwhile to notice that literacy may have certain negative and even dysfunctional effects.

Likewise, immigrant literacy possesses to a large extent the same characteristics as literacy, while retaining its specific properties. The historical process of immigrant literacy in Canada mirrors the shift of Canadian ideology, from cultural assimilation to cultural pluralism. Though cultural pluralism creates better cultural environments for immigrant literacy, social inequality still exists if genuine institutional integration does not take place. As was mentioned previously, literacy is sometimes misused as a "gatekeeper" for keeping immigrants disenfranchised. It should be emphasized again that, for immigrants, literacy is their human right. It is an important prerequisite and, at the same time, an indispensable means for them to adjust to the new life and participate fully in the societal life in Canada.

Beside these cultural, social and political contextual factors, there are specific demographic and socioeconomic background factors which have direct effects on immigrant literacy

achievement on a personal level. The study of the direct effects of these factors on immigrant literacy, and of their direct and indirect effects, when immigrant literacy is taken into consideration, on financial income in the two basic models are the focus of the research. Combined with the discussion on literacy and immigrant literacy in general on social level, the elaboration on these influential variables on immigrant literacy in the light of related literature have laid a theoretical foundation for the study.

CHAPTER THREE

Methodology

Methodology can be considered as an important vehicle to the success of a study. As mentioned previously, this study was based on the 1989 National Survey of Literacy Skills Used in Daily Activities (LSUDA). It employed the statistical method of the ordinary least squares regression to analyze the data. By means of that, the study endeavours to explain and predict a set of socioeconomic and demographic characteristics in relation to the functional literacy of foreign speaking immigrants as well as to their income.

This chapter firstly conveys the necessary information on the survey (LSUDA) and data collection based on the material provided by Statistics Canada (1990). Secondly, the design of the study is displayed and described in detail, including sample selection, data weighting and model development. This chapter, thirdly, specifies each of the variables in terms of mnemonics. Then the basic hypotheses are raised for testing in demographic and socioeconomic models. Finally, a discussion is addressed to possible type of methods for the research and the reason for the choice of the method actually used.

Information on the Survey and Data

The National Survey of Literacy Skills Used in Daily Activities (LSUDA) was conducted by Statistics Canada in collaboration with the Department of the Secretary of State of Canada in October 1989, after the completion of a feasibility study in April 1988 and a pilot survey in April 1989. The principal objective of the LSUDA was to develop a detailed and precise literacy profile of Canada's population aged 16-69 for each official language, which would allow extensive and intensive analyses of the assessed literacy skills of Canadian adults in relation to various socioeconomic and demographic indicators. The special and central feature of the LSUDA was the direct and multi-dimensional assessment of the literacy skills of the Canadian adult population (Statistics Canada, 1990, 1991).

Sampling

The Survey of Literacy Skills Used in Daily Activities was administered as a sub-sample of the Labour Force Survey (LFS) sample. The LFS is Canada's largest continuing monthly household survey of the general population aged 15 or older in Canada's ten provinces. The LFS sample was obtained through a stratified, multi-stage process by probability sampling at all stages of the design. Approximately 47400 households were selected from three types of areas (self-representing, non-self-representing, and special areas)

in different economic regions. About 98400 eligible persons were further selected from these dwellings, which formed the LFS sample. From this sample, one person aged between 16-69 was initially selected at random from each dwelling for the LSUDA. Then, records representing selected individuals were sorted twice according to age, province, educational attainment, and LFS stratum identification in order to make the sample representative. In this way, the LSUDA selected its typical sample of 13571 persons aged 16-69 across Canada.

The use of LFS respondents was advantageous because personal information (age, gender, province of residence, educational attainment, etc.) was already obtained. The information was used either to efficiently tailor the sample to meet the specific survey requirements or to be included directly into the database.

Residents of Yukon and the Northwest Territories, members of the Armed Forces, persons living on Indian reserves and inmates of institutions were not included in the sample of LSUDA as these populations had been excluded from the coverage of the LFS. The exclusion of these groups accounted for about less than 3% of the Canadian population aged 16-69 (Statistics Canada, 1990, 1991).

Survey Instruments

The survey instruments consisted of two main components: a

background questionnaire and a series of tasks that were designed to directly measure the literacy skill levels of Canadian adult population.

Primarily, the background questionnaire gathered two kinds of information:

1) Information was gathered on individual socio-demographic characteristics in relation to literacy skills. For instance, the level of schooling of the respondent, parent educational achievement, the immigration status, the mother tongue, the age at which English or French was first learned, the literacy demands of the occupation, etc..

2) Information was also gathered on self perceived literacy skills and needs in English or French, and, self assessed literacy competency on the mother tongue other than English and French if applicable.

A "screening" questionnaire and a "main" questionnaire formed the second component of the survey, in which there were a total of 44 specific tasks.

1) The "screening" questionnaire contained 7 core tasks requiring literacy at lower or middle levels. It was designed to identify respondents with very limited literacy skills in one of the official languages. Those who had very low literacy abilities were not required to perform the remainder of the tasks in the "main" questionnaire.

2) The "main" questionnaire with 37 tasks which were more diversified in complexity and subject matter, was designed to measure specific reading, writing and numeracy abilities.

All these tasks were designed to measure a range of different literacy abilities according to predefined levels for reading, writing and numeracy (see the next page). Most importantly, all the tasks were of those types commonly encountered in daily life in Canadian society. In other words, tasks were confined to different levels within the functional literacy continuum. Tasks more likely encountered in the school settings or involved technical literacy were excluded.

For reading, tasks required abilities ranged from locating an item, or a piece of information, to more complex abilities like integrating various pieces of information in a document. For example, respondents were asked to circle the expiry date on a driver's licence or to complete a line graph after reading a graph on tourism. Since it required a long time to complete the writing tasks, there were only two writing tasks: a simple message requesting a household member to turn on the oven and a letter to a company requesting the repair of an appliance. Tasks to measure numeracy abilities included locating family swim hours on a swimming pool schedule, to find the lowest price by comparing grocery labels, to check the net deposit on a deposit slip, and to calculate the shipping charge on a catalogue order form. In some

cases, a task was used to measure both reading and numeracy abilities when both abilities were to be involved in completing, such as reading a swimming pool schedule and filling in a bank deposit slip (Statistics Canada, 1990, 1991).

The Measurement of Functional Literacy

As noted previously, functional literacy was defined as a continuum for reading, writing, and numeracy in the LSUDA. There were four levels for reading, which was considered the main component of functional literacy (Statistics Canada, 1990).

Level 1: Canadians at this level have difficulty dealing with printed materials. They most likely identify themselves as people who cannot read.

Level 2: Canadians at this level can use printed materials only for limited purposes such as finding a familiar word in a simple text. They would likely recognize themselves as having difficulties with common reading materials.

Level 3: Canadians at this level can use reading materials in a variety of situations, provided the material is simple, clearly laid out and

the tasks involved are not too complicated. While these people generally do not see themselves as having significant reading difficulties, they tend to avoid situations requiring reading.

Level 4: Canadians at this level meet most everyday reading demands. This is a diverse group which exhibits a wide range of reading skills.

There were three levels for numeracy.

Level 1: Canadians at this level have very limited numeracy abilities which enable them to, at most, locate and recognize numbers in isolation or in a short text.

Level 2: Canadians at this level can deal with material requiring them to perform a simple numerical operation such as an addition and subtraction.

Level 3: Canadians at this level can deal with material requiring them to perform simple sequences of numerical operations which enable them to meet most everyday demands.

All the tasks were grouped into those different reading and numeracy levels according to their level of difficulty through a statistical scaling technique called item response theory (IRT). IRT calculated an estimate of each task's difficulty on a scale ranging from 0 to 500. The ranges for each level were determined on the basis of the scores of the easiest task at that level and the most difficult task at that same level. The reading continuum was then divided into the following levels:

Level 1: Under 160

Level 2: 160-204

Level 3: 205-244

Level 4: 245 and over

IRT was used not only to assign scores to tasks that reflected their difficulty, but also to determine individuals' reading and numeracy ability score and level in accordance with their performance. The individual's score was the difficulty of the most difficult task that the individual had an 80% chance of answering correctly. Thus, an individual's level was the highest level at which he/she could perform consistently. Any individual whose score was over 245 was at reading level 4, and any whose score was over 205 but less than 245 was at reading level 3 and so on.

Data Collection

The data collection was done by way of a personal interview in the respondent's household in October, 1989. The interviewers carrying out the data collection were the same interviewers for the Labour Force Survey. They had been trained to administer the interview in a neutral manner and to adhere strictly to interview instructions. Their training also helped them to deal with various situations involving language difficulties, literacy deficiency, reluctance and other difficulties possibly occurring during the interview. In addition, they were provided with a Training Manual, an Interviewers Manual and a Procedures Manual.

Interviewers were supposed to record all responses for each task: an attempt, a refusal or a verbally expressed inability to perform the task by the respondent. They were expected to encourage respondents to read and attempt all tasks. If a respondent could not speak one of the official languages, an interpreter was employed to administer the background questionnaire. Then, the respondent was asked to try the simulated tasks without the help of the interpreter. An account was made of respondents who were unable to perform any of the simulated tasks due to language barriers.

The overall response rate was 70% for the LSUDA, with 9455 respondents. It was expressed as a percentage of actual individual responses to the survey out of the preselected sample. Analysis of

the non-respondents by age and schooling suggested that they were not concentrated in any particular group in terms of age and schooling.

Therefore, the LSUDA data can be described as the richest and the most reliable database ever available for the study of immigrant functional literacy in one of the official languages as well as on Canadian adult literacy (Statistics Canada, 1990, 1991).

Design of the Study

The urgent needs of studying the functional literacy of foreign speaking immigrants in one of the official languages makes this project worthwhile and valuable. The 1989 National Survey of Literacy Skills Used in Daily Activities provided this research with the sample of the target population and the comprehensive data. The related literature contributed to the theoretical basis and conceptual framework of the study. Then, the concrete analyses on the effects of the demographic predictors on functional literacy in English or French, and the analyses on the independent and dependent effects of literacy on economic earnings are conducted in the basic models and extended models at two stages.

Selecting the Sample of the Target Population

The sample of the target population for the study was selected by two criteria: 1) birth place being outside Canada; 2) mother tongue being other than English or French. A considerable portion of immigrants who were born outside Canada speak English or French. It is also true that quite a number of Canadians born in Canada did not speak English or French as their first language. Therefore, neither of the above two variables could be used as sole criterion to determine the sample of the target population. Only when those two variables were employed simultaneously to be the criteria, could the right sample be selected. As a result, 624 cases were selected out of 9455 respondents in the LSUDA sample (some 6.6 percent) to represent the population of non-official-language-speaking immigrants in Canada in this research.

Weighting the Data

In a probability sample such as the sample in this research, each case in the sample represents several other persons not in the sample. This is to say that the sample for the study represent a certain number of the defined population. To derive unbiased estimates representative of the national population of foreign speaking immigrants aged 16-69, the weighting procedures were used in order to compensate for the over- or undersampling.

A weighting variable was predefined in the database. The final weight attached to each record was the product of the following factors: the selection probabilities, the cluster sub-weight, the balancing factor for non-response, the rural-urban factor, the province-age-sex ratio adjustment factor and the independent economic region adjustment factor.

In the analyses, the weighting variable was first divided by 10000. Therefore, the numbers of weighted cases obtained are exactly same as the figures released by Statistics Canada. There were 624 sample cases selected from the LSUDA for this research. After weighting in statistical procedures, the weighted target population that the sample stood for was of **1909435** cases.

However, as the weighted cases increased, certain parameters, i.e., t-value and probability, appeared to be significant merely because of the artificially large weighted number of cases. In order to reduce the inflation of t-value and probability and make the results more accurate and interpretable, all weights were then divided by a constant, 3060. As a result, the weighted number of cases exactly corresponded to the unweighted number of cases with all the estimates for the population unchanged except desired change in t-value and probability.

The Basic Models

These two basic models, namely, the demographic model and the socioeconomic model, were designed on the basis of established conventions and previous research in regard to the particular properties of immigrant literacy in one of the official languages. Figures 1, 2A and 2B (pp. 21-23) present the two basic models.

Five groups of variables are related to literacy (reading and numeracy) ability and achievement variables in the way shown in the first demographic model. Each group is composed of a set of variables which are expected to have effects on immigrant functional literacy in English or French. The five groups are (i) immigrant personal predictors: age, gender, period of immigration; (ii) social context predictors: the immigrant's origin in terms of world regions, province of the immigrant residence; (iii) educational predictors: parental educational attainment level, the highest level of schooling that the immigrant completed before he or she first immigrated to Canada, the highest level of educational attainment achieved in Canada; (iv) language predictors: self assessment of literacy proficiency in the first language, age when starting to learn English or French, language spoken at home, language spoken outside the home; and (v) a socioeconomic predictor: the immigrant's occupation. These five groups of variables are assumed to be exogenous and independent variables, which are expected to have impact on the immigrant

functional literacy in one of the official languages.

The variables standing for the immigrant functional literacy in one of the official languages in the model are reading ability, numeracy ability, reading achievement and numeracy achievement. They are assumed to be endogenous variables and dependent variables in the first model. In other words, they are expected to be responsive to the demographic variables. In the second model, all the independent variables are basically same, while literacy abilities and achievement: reading ability and numeracy ability, reading and numeracy achievement, become endogenous and intervening variables. On the one hand, these four variables are accounted for by the demographic variables. On the other hand, they have independent effects on the other variable, income, which is the dependent variable of final interest or the criterion variable in the socioeconomic model. From the review of the relevant literature and previous research, the two basic models are shown to be theoretically acceptable.

Two Stages of Model Development

There were two stages of model development in the research. At the first stage, the analysis was done in the two basic models and the goodness of fit of the models was tested statistically in terms of R square, adjusted R square, with due consideration given to standard errors and F-values. The results showed that the goodness

of fit for the four equations in the model were satisfactory. The highest R square is .55 for RDABIL (reading ability) and the lowest is .32 for NUMACH (numeracy achievement). That means the basic model can explain 55% of variance in reading ability and 32% of variance in numeracy achievement.

Then effects of independent variables on each dependent variables were examined and independent variables were selected by their regression coefficient, t-value and significance level. One more independent variable, occupation, was added to the basic socioeconomic model. Two variables, literacy competency in the first language and province of residence, appeared to be not statistically significant in most of the equations. At the beginning of the second stage, six dummy variables were created from province of residence for further analysis in the semi-developed models. Once again, no significant differences could be found between provinces in terms of immigrant literacy abilities. Therefore, both literacy competency in the first language and province of residence were eliminated from the developed models at the second stage. Other variables were rearranged according to the results of the analyses done at the first stage. At the second stage, four sets of dummy variables were created out of the original variables so as to develop demographic and socioeconomic models.

The final analyses were conducted respectively in developed

demographic model and socioeconomic models in the manner shown in Figures 1, 2A and 2B. The only difference between the two developed socioeconomic models is that in developed model 2A, the intervening variables are reading ability and numeracy ability while in developed model 2B, they are reading achievement and numeracy achievement. Due to its effect on the degrees of freedom, standard error and F-value, a minimum ratio of the number of cases to the number of independent and intervening variables in the equations of a model (20:1) is required. With created dummy variables, there are 29 independent variables plus 2 of the 4 intervening variables in one of the 4 equations for each model, which are the maximum independent and intervening variables a model may contain for a sample of 624 weighted cases. If all the 4 intervening variables had been included in one model, it would have exceed the maximum number of variables allowed. As a result, 2 degrees of freedom would be lost and the standard error would increase. The results, therefore, might not be accurate and reliable. Besides, literacy achievements are proxies for literacy abilities. If the 4 variables are included in one model, it might violate the assumption of linear independence of the two sets. Therefore, similar yet necessary analyses had to be done in two separate models.

Description of Variables

As mentioned above, there were five sets of exogenous variables in the basic models, each containing one to four

variables, thirteen in total. Besides, there are four endogenous and intervening variables and one dependent variable. In the developed models, four sets of dummy or dichotomous variables were created, which brought the number of independent variables up to 29. The following is the detailed description of the variables used in the study.

Personal Predictors

Age

The age variable provided in the database was collapsed into five groups: 1) 16-24 years; 2) 25-34 years; 3) 35-44 years; 4) 45-54 years; 5) 55-69 years. The age variable was a single ordinal variable in the basic models, coded in a scale of 1-5 as stated above. In the stage-two models, five dummy or dichotomous variables, AGE1 to AGE5, were created from the age variable so that its effects could be studied in detail.

Gender

Gender, like age, was a variable derived from the April 1989 file of the LFS. It was a binary variable: males were coded as "1" and females were coded as "2".

Period of Immigration

This variable was an ordinal variable denoted by five periods during which immigrants first arrived to live in Canada: 1) prior to 1950; 2) 1950-1959; 3) 1960-1969; 4) 1970-1979; 5) 1980-1989.

For the purpose of the analyses in this study, the variable was recoded as 1) 1980-1989, 2) 1970-1979, 3) 1960-1969, 4) 1950-1959, and 5) prior to 1950. When coded in this sequence, the earlier periods of immigration yielded higher values. At the second stage, five dummy variables were created out of Period of Immigration, PRDIMM1 (1980-89) to PRDIMM5 (prior to 1950). Each referred to a corresponding coded period.

Social Context Predictors

World Region of Origin

This variable was indicated by the immigrant's birthplace in terms of world regions. It was a nominal variable. The original variable was Country of Birth. It was grouped into world regions as 1) USA, 2) South America, 3) Western Europe, 4) Eastern Europe, 5) Northern Europe, 6) Southern Europe, 7) Africa, 8) Asia and Oceania. As another variable in the questionnaire, Ethnic Origin, was dropped from the database for confidentiality reasons, grouped Country of Birth was the only measure available for the immigrant's origin. Therefore, this variable only provides information of the immigrant's origin in terms of birthplace. It was not a reliable measure of a person's ethnic or cultural origin due to the increasing mobility of the world's population.

In the stage-two models, another set of dummy variables was derived from World Region of Origin. They were BIRTH1: born in

South America; BIRTH2: born in Western Europe; BIRTH3: born in Eastern Europe; BIRTH4: born in Northern Europe; BIRTH5: born in Southern Europe; BIRTH6: born in Africa; BIRTH7: born in Asia and Oceania. Those who were born in the U.S.A. and whose mother tongue was not English were likely to be the descendants of migrants from other regions to the U.S.A.. It was obviously an ambiguous indicator of one's origin in this case. Therefore, this group (only five cases) was not included in the dummy variables.

Province of Residence

This variable indicated the province where the immigrant was living as a resident at the time of the survey. The sample covered 10 provinces except the Yukon and the Northwest Territories. The original variable from the database was coded on a scale of 0 to 9 from the east to the west. Since most of immigrants preferred to settle in Canada's largest metropolitan centres, e.g., Toronto, Montreal, Vancouver, Calgary, the distribution of immigrants settlement in Canada was enormously differentiated. The same was true with the provincial allocation of the sample. In this case, the variable was recoded to better reflect the characteristics of the immigrant settlement: 3) Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick (East Canada); 4) Quebec; 5) Ontario; 6) Manitoba and Saskatchewan (Prairies); 8) Alberta; 9) British Columbia.

Six dummy variables corresponding to the coding scale were

created for the further analysis with Ontario as a reference variable. It was expected that province of residence would have effects on the variance of immigrant functional literacy in one of the official languages, because it was assumed that the metropolitan centres which had been attracting a lot of immigrants would provide better immigrant services and immigrant literacy programs than other provinces and areas. However, the effects of province of residence was not statistically significant in accounting for the differences in immigrant literacy in one of the official languages in the model, with t-values less than 1. (It is considered statistically significant if a t-value is equal to or greater than 2) . Therefore, province of residence was dropped at the second stage of model development.

Educational Predictors

Parental Education

Two measures, father's and mother's eduction, were combined to be used as an indicator of parental education. Father's and mother's education were reported as the highest level of schooling completed by each parent. They were recoded into seven-point scales in the study: 1) no schooling or kindergarten only; 2) elementary school; 3) some secondary school or trade\vocational training; 4) secondary school\trade\vocational certificate or diploma; 5) some college\university; 6) college\university certificate or diploma; 7) bachelor degree or above. This was an ordinal variable.

Education before Entry

This variable referred to the highest level of schooling that the immigrant completed before he or she first came to live in Canada. It was an ordinal variable. Like parental education, it was also recoded into a seven-point scale, ranging from "no schooling or kindergarten only" to "bachelors degree or above".

Education in Canada

This variable referred to the highest level of educational attainment that the immigrant achieved in Canada. The same seven-point scale was employed here to recode the variable. The higher value indicated the higher level of schooling completed. It was an ordinal variable.

Language Predictors

Literacy Competency in the First Language

This was a composite variable. Two measures were used as the indicator of literacy competency in the first language. One was on wether or not the respondent could read or write in the first language. The other measure was obtained by the self assessment of the immigrant on his or her reading and writing skills in the first language. A scale of 1 to 5 was used to measure the literacy of the first language, ranging from being poor to being excellent. Whereas the variable for the research used the same scale but with one more

value, 0 , added to the scale, which indicated those who were illiterate in their first language. This was an ordinal variable. There were 10 missing cases for this variable. The missing subjects were those who did neither state wether they could read or write in their native language nor what level of their competency was in their native language.

Age When Starting to Learn English or French

This variable was categorized into five age groups corresponding to when the immigrant first started to learn English or French. The five age groups were scaled in this way: 1) 1-4 years; 2) 5-10 years; 3) 11-15 years; 4) 16-20 years; 5) 21 or older. Since the previous studies show that age when starting to learn English or French has a sort of inverse variation with level of literacy in English or French, the variable was recoded in the inverse way: 1) 21 or older; 2) 16-20 years; 3) 11-15 years; 4) 5-10 years; 5) 1-4 years. This was an ordinal variable. Those who did not speak English or French were considered as missing cases.

Language Spoken at Home

This variable referred to the language the immigrant spoke most often at home. There were three categories for this variable in the database: 1) English; 2) French; 3) other. For reasons of confidentiality, all languages other than English and French were collapsed into "other". In this study, the variable was recoded

into a dichotomous variable: 0) other languages; 1) English or French. There was one subject who did not state what language spoken most often at home. That was considered as a missing case.

Language Spoken Outside the Home

This variable referred to the language the immigrant spoke most often in activities outside the home, i.e., at work, in social life, and in communities. This variable was also a dichotomous variable, coded in the same way as Language Spoken at Home: 0) other languages; 1) English and French. Two subjects who did not state were considered as missing cases.

The Socioeconomic Predictor

Occupation

This variable was obtained from the Labour Force File done in April 1989. The variable indicated the type of occupation the immigrant held in April 1989, or of the last job held prior to that date within a 5 year period. It had been collapsed into 31 categories of occupation, and 2 categories for being not employed in the database. It was recoded again in this study for the convenience of analysis in the following manner:

1) not employed, including two categories: 32, never worked\permanently unable to work, and 33, last worked more than 5 years ago;
2) transportation and equipment, including three categories:

29, transport equipment operating occupations, 30, material handling, and 31, other crafts and equipment operators;

3) construction, consisting of four categories: 25, wood products, rubber, plastics and other related, 26, mechanics and repairman, except electrical, 27, excavating, paving, wire communications and related, and 28, other construction trades;

4) skilled manual occupations, containing three categories: 22, machining and related occupations, 23, electrical, electronics and related equipment, and 24, textiles, furs and leather goods;

5) primary occupations, including three types: 19, farm occupations, 20, primary occupations, and 21, processing occupations.

6) services, consisting of five gropes: 14, sales occupations, 15, protective services, 16, food, beverage preparation; lodging and accommodation related, 17, personal, apparel and furnishing services, and 18, other service occupations;

7) clerical occupations, encompassing the following categories: 9, stenographic and typing, 10, bookkeeping, account-recording and related, 11, EDP operators and material recording, 12, reception, information, mail and message distribution, and 13, library, file., correspondence, other clerical and related;

8) professional, containing the following: 3, life science, maths, systems analysts and related; 4, architects, engineers and related; 5, social science, religion and related, 6, teaching and related, 7, health occupations and related, and 8, artistic and recreation;

9) management, consisting of two categories: 1, managers and administrators, and 2, management and administration related.

This variable was not included in the demographic model at first. When province of residence and literacy competency in native language were found not to be statistically significant predictors ($t<2$) and were dropped from the models at the second stage, occupation was added to the socioeconomic model to be examined.

At the second stage of model development, nine dummy or dichotomous variables were used for occupation, from OCCU1 to OCCU9 according to the coded order of the variable.

Endogenous and Intervening Variables

Reading Ability

Reading ability was indicated by an individual's score on reading items on a 0-500 scale. The scoring method was item response theory scoring. ITR scoring provided a joint estimate of item difficulty and examinee reading ability. Generally, IRT

difficulty-ability estimates presented standard scores on a scale with a theoretical mean of 0 and a standard deviation of 1. This variable was an interval variable.

Numeracy Ability

Numeracy ability was indicated by an individual's score on numeracy items. The score was obtained and presented in the same way as reading ability: item response theory scoring. It was an interval variable.

Reading Achievement

This was a dichotomous variable created out of the variable "reading level" in the database. The original variable had a scale of four reading levels plus 0 for those who did not attempt the tasks because of language barriers. An individual's reading level was determined by his or her reading ability score. Whereas reading achievement was dichotomized into reading level 4 achieved, representing 36.1% of the target population, and less than reading level 4 obtained, representing 63.9% of the target population. In other words, the variable denoted the functional literacy acquired to meet most everyday reading demands, or the lack of such literacy.

Numeracy Achievement

This was a dichotomous variable similar to reading achievement. The original variable in the database was "numeracy

level". It indicated different numeracy levels of the subjects based on their IRT numeracy ability score. Numeracy achievement was dichotomized into numeracy level 3 achieved by the immigrant, representing 42.1% of the population, and less than numeracy level 3 obtained, representing 57.9% of the population. That is to say, the variable indicated the functional literacy acquired that enabled the immigrant to perform simple sequences of numerical operations to meet most everyday numeracy demands, or the deficiency of it.

The Dependent Variable

Income

This was an interval variable referring to the immigrant's personal income before taxes and other deductions. It ranged from 0) no income to 8) $60,000 or more. Those who did not state or said that they did not know what their personal income was before taxes and other deductions were considered as missing cases.

Hypotheses

At the first stage of model development, 48 hypotheses were raised, related to influence of the demographic predictors on reading ability, literacy achievement, numeracy ability and numeracy achievement respectively, which formed the basic

demographic model. After test analyses, 5 more hypotheses, related to the effects of occupation on the four intervening literacy variables as well as on income, were added to the research design. Meanwhile, 10 additional hypotheses were brought up, concerning the impact of the demographic predictors on income. Besides, 4 extending hypotheses were raised, related to the effects of reading ability, literacy achievement, numeracy ability, and numeracy achievement on income, when controlling for the demographic variables. With a total of 59 hypotheses, the basic socioeconomic model was constructed.

At the second stage of model development, 8 hypotheses, concerning the influence of province of residence and literacy competency of the first language, which had been rejected, were eliminated from the models. With 4 sets of dummy variable created, there were altogether 33 independent variables, 2 intervening variables and 1 dependent variable in the correlation matrix in each model. One of the dummy variables in each of the 4 sets was omitted from the equations to become the reference variable against which the remaining effect parameters were evaluated. The reference variable usually represents the second largest group within each set of the dummy variables. Thus, 29 independent variables were entered in each of the eight equations within two models, plus 2 intervening variables in two of the eight equations. That incorporated 178 hypotheses. They formed a set of twin extended socioeconomic models: socioeconomic model A and socioeconomic

model B.

The following are the basic hypotheses:

1A. Immigrant literacy (reading and numeracy) abilities will be responsive to age group membership. The younger age cohorts are expected to have higher literacy abilities than the older age cohorts.

1B. Literacy achievement (reading and numeracy achievement) will be responsive to age cohorts in a similar manner. The younger age goups are also more likely to achieve functional literacy in English or French than the older age groups.

1C. Income is expected to be responsive to age group membership, too, but in a different manner from literacy abilities and achievement. Middle aged groups may earn more than either the youngest and the oldest groups.

2A. Gender is expected to make a difference in immigrant literacy abilities. Given the unequal social status and unequal opportunities for education and employment for men and women in some of the source countries, women immigrants are likely to have lower literacy abilities.

2B. Likewise, gender is expected to make a difference in immigrant literacy achievement. Women are likely to be less functionally literate in one of the Canadian official languages than are men immigrants, and to have more difficulties in dealing with print material in daily life.

2C. The gender difference in immigrant personal income will be

greater than in the literacy area. Women immigrants are likely to be significantly disadvantaged in terms of personal income.

3A. Other conditions being equal, the longer the immigrant has resided in Canada, the higher his or her literacy abilities will be.

3B. Similar relationships will be found in period of immigration and literacy achievement: the longer the immigrant has resided in Canada, the more likely he or she will be functionally literate in English or French.

3C. The same will hold true for the relationship between period of immigration and personal income. The immigrant income is expected to have a positive linear relationship with the period for which he or she has lived in Canada.

4A. Immigrant literacy abilities will reflect the differences of world regions of origin in terms of cultural background and literacy level. Immigrants who were born in regions with similar cultural background as Canada and high national literacy level, e.g., West Europe, are likely to perform better in literacy than those born in other regions. However, those who were born in Asia may achieve better outcomes in numeracy, given the theory that Asians are likely to be good at numeracy.

4B. Immigrant literacy achievement will reflect the differences of world regions of origin in a similar manner to immigrant literacy abilities.

4C. Income, then, is expected to be responsive to world regions of

origin, too. There will be significant differences of origin in personal income. Immigrants of visible minorities are more likely to be disadvantaged in personal income.

5A. Province of residence will affect immigrant literacy abilities Given that better immigrant services and literacy programs are provided in those largest metropolitan areas, like Ontario, Quebec, British Columbia and Alberta, immigrants who live in those provinces are likely to have higher literacy abilities.

5B. The same will be true with the relationships between province of residence and immigrant literacy achievement. The immigrants who live in the largest metropolitan areas are more likely to be functionally literate than immigrants residing in other provinces.

6A. Parental education will have a positive influence on immigrant literacy abilities. The higher the parental education level, the higher the immigrant literacy abilities will be, other conditions being equal.

6B. The higher the parental education level, the more likely the immigrant will be functionally literate in English or French if other conditions are equal.

6C. Parental education will have an effect on immigrant personal income, but the effect may not be highly significant.

7A. Immigrant literacy abilities will vary positively as the level of the immigrant educational attainment in his of her native country before entry.

7B. The higher the level of educational attainment the immigrant

achieved before entering Canada, the more likely he or she will be functionally literate in English or French.

7C. Education before entry will have a positive effect on personal income.

7D. However, education before entry tends to be a less powerful determinant than education in Canada for immigrant literacy abilities and achievement, as well as personal income.

8A. Eduction in Canada is expected to be one of the most powerful predictors in accounting for immigrant literacy abilities and achievement, as well as income.

8B. The higher the level of educational attainment the immigrant achieved in Canada, the higher the immigrant literacy abilities will be.

8C. Education in Canada will have a significantly positive effect on immigrant functional literacy in one of the Canadian official languages.

8D. Personal income is highly responsive to education in Canada.

9A. Immigrant literacy abilities in one of the official languages is a function of literacy competency in the first language, given the theory on the correlation between literacy in the first language and in the second language.

9B. Literacy competency in the first language will have a positive effect on immigrant literacy achievement.

10A. Age when starting learning English or French will be another powerful predictor in accounting for immigrant literacy abilities and achievement. The immigrants who started learning

English or French at younger age cohorts will have higher literacy abilities than those who started in older age cohorts.

10B. The immigrants who started learning English or French at younger age cohorts are more likely to be functionally literate in that language.

10C. Age when starting learning English or French has a significant effect on personal income, other conditions being equal.

11A. The language spoken at home will affect the immigrant literacy abilities in a positive way, and the effect will be significant.

11B. The immigrants who speak English or French most often at home are more likely to be functionally literate than those who do not.

11C. The immigrants who speak English or French most often at home tend to have better communicative skills in that language, which will enable them to earn more income.

12A. Language spoken outside the home will affect the immigrant literacy abilities in the same way as does language spoken at home. The immigrants who speak English or French most often in activities outside the home tend to have higher literacy abilities than those who do not.

12B. The immigrants who speak English or French most often in activities outside the home are more likely to be functionally literate in that language than those who do not.

12C. Language spoken outside the home will influence personal income.

13A. Immigrant literacy abilities in English or French is a function of the type of occupation the immigrant has, due to the different functional literacy requirements of various types of occupation.

13B. As well, immigrant literacy achievement is a function of the immigrant occupation.

13C. Likewise, the immigrant's income will be responsive to the type of occupation he or she has.

14A. When controlling for demographic and socioeconomic predictors, the impact of literacy abilities and literacy achievement on immigrant personal income will not be significant.

14B. Immigrant literacy abilities and achievement will mediate the effects of the demographic and socioeconomic predictors on income. The higher the literacy abilities and achievement in English or French, the less the negative effects the demographic and socioeconomic predictors will exert on income, in turn, the higher the income will be.

Type of Methods

Besides basic descriptive statistics and anova analysis, there are other modes of analysis possible for the models, such as logit regression, probit regression and ordinary least squares regression.

Logit Regression and Probit Regression

For developed socioeconomic model A, two intervening variables are dummy or dichotomous variables. In this case, logit regression and probit regression should be applied. However, missing cases became a formidable obstacle in the analysis. All the cases with missing data for even one variable were rejected, with only 504 valid unweighted cases out of 624 left in the logit and probit models. Therefore, the results would not be reliable. Besides, the dependent variable, personal income, is not a dichotomous variable and thus, ordinary least squares procedures have to be used for analysis of step two in the model. There would occure a problem that total effects cannot be calculated with indirect effects estimated with two different procedures: logit and probit regression, and ordinary least square regression, since they are not in a way that can be directly comparable (Clifton, Williams & Clancy, 1990). Because of these two main reasons, logit analysis and probit analysis were not used for the final analyses in the study. In addition, according to Bulcock (1990), "when mean response range for a binary dependent variable is between .3 and .7..., there is little to be gained from using either logit or probit analysis" (p.33). It is the case here in developed socioeconomic model A, where the mean of literacy achievement is .361 and the mean of numeracy achievement is .421. As a result, ordinary least squares regression was employed instead of logit and probit regression in the analyses.

Ordinary Least Squares Regression

Ordinary least squares regression is the most effective and comprehensive mode of analysis. It can provide a wide range of statistical information, including mean, standard deviation, variance, covariance, correlation, 1-tailed significance, R square, regression coefficients, t-values and F-values, etc..

Ordinary least squares regression was used in the study to analyze the data, explain and predict the effects of demographic and socioeconomic predictors on functional literacy and income. It maximized the accuracy of predictions of immigrant functional literacy and income with the least sum of the squared residuals (errors of estimate) within the models as criterion. All the predictions of intervening variables (literacy abilities and achievement) and dependent variable (income) from independent variables as well as intervening variables evidenced a regression toward the means, which formed the lines of best fit. Thus, reliable explanation and prediction on the demographic and socioeconomic characteristics of immigrant functional literacy and income could be made on the basis of the results.

The software this study used to run ordinary least squares regression and other anova and descriptive analyses is SPSS-X release 4.1 for VAX/VMS.

CHAPTER FOUR

Results

In this chapter, I will report and discuss the results of the data analyses for the two models; namely, the demographic model and the socioeconomic model. Before doing this, it is worthwhile to compare the results of descriptive analyses on the literacy abilities, literacy achievements and personal income of Canadian born citizens with those of the general immigrant population; and similarly, to compare the same results for official language speaking immigrants with those for non-official language speaking immigrants. Differences will be drawn from the comparisons. By doing so, a clear picture of present situation of non-official language speaking immigrants' functional literacy and economic status will be depicted in the Canadian context. Thereafter, the focus will be moved to non-official language speaking immigrants. The results of multivariate analyses obtained by using ordinary least square procedures will be presented in table forms and elaborated in the following sessions: (i) factors influencing the reading and numeracy abilities of non-official language speaking immigrants in Canada; (ii) factors influencing the functional reading and numeracy achievements of non-official language speaking immigrants in Canada; (iii) analysis of the effects on personal income of non-official language speaking immigrants. Finally, the findings will be discussed in the forms of the two developed models so as to answer the basic research questions raised in Chapter One.

Descriptive Analyses

Comparisons Among Canadian Born Citizens and Immigrants in Literacy

A literacy and personal income profile of two sets of subpopulations of the Canadian adults aged 16-69 is presented in Table 4.1. Of the defined Canadian adults population, 82.1% are Canadian born citizens, and 17.9% were born outside Canada, or are immigrants in general sense. Among those immigrants, 39.9% are official language speakers, i.e., English or French being their first language, and 60.1% are non-official language speakers, whose mother tongue is any language other than English or French.

It was reported by Statistics Canada (1991) that "sixty-two percent of Canadian adults aged 16 to 69 have sufficient reading skills to deal with most everyday reading requirements (level 4). Their skills enable them to acquire further knowledge using printed material" (p. 9). This is the percentage of the total population represented by the survey sample, including persons who reported having no skills in either of Canada's official languages. As for numeracy, sixty-two percent of the Canadian adult population have level 3 numeracy skills which enable them to meet the numeracy demands required in most everyday activities. However, this does not include those who reported having no skills in either of the

Canadian official languages or those whose reading skills were too limited to undertake the main test items.

The results of descriptive analyses of this research presented in Table 4.1 show significant differences in literacy profiles when comparisons are made between Canadian born citizens and immigrants. Sixty-six percent of Canadian born citizens achieved level 4 reading skills compared to forty-eight percent for general immigrants and sixty-three for the total of the two subpopulations. Correspondingly, the mean score of reading ability for Canadian born citizens is 260.0, while it is 237.3 for general immigrants, which is 22.7 points lower.

The same is true with the numeracy level and ability. Sixty-two percent of Canadian born citizens have numeracy skills of level 3 and fifty-one percent of general immigrant population are categorized at the same level. The percentage of the entire population reaching numeracy level 3 is sixty. The mean score of numeracy ability for Canadian born citizens (252.5) is 26.4 points higher than that of general immigrants (226.1).

The gaps are even wider between official language speaking immigrants and non-official language speaking immigrants on all the four literacy variables. Sixty-seven percent of official language speaking immigrants have reading skills of level 4 which enable them to function effectively in dealing with printed material in

Table 4.1

Means and Standard Deviations of the Literacy Variables and Income by Canadian Born Citizens and Immigrants, and by Official Language Speaking Immigrants and Non-official Language Speaking Immigrants

	Population (Thousands)	RDACH $\bar{X}$	RDACH SD	NUMACH $\bar{X}$	NUMACH SD
Canada Total*	**17699**	**.63**	**.48**	**.60**	**.49**
Canadian Born Citizens	14522	.66	.47	.62	.49
Immigrants	3177	.48	.50	.51	.50
E./F. Spkg Immigrants	1267	.67	.47	.65	.48
Non E./F. Spkg Imm.	1909	.36	.48	.42	.49

	RDABIL $\bar{X}$	RDABIL SD	NUMABIL $\bar{X}$	NUMABIL SD	INCOME $\bar{X}$	INCOME SD
Canada Total	**255.9**	**47.3**	**247.7**	**58.9**	**3.98**	**2.25**
Canadian Born Citizens	260.0	43.8	252.5	50.0	3.95	2.22
Immigrants	237.3	56.9	226.1	85.7	4.12	2.32
E./F. Spkg Immigrants	263.8	42.0	259.6	44.0	4.37	2.31
Non E./F. Spkg Imm.	219.7	58.7	203.9	98.4	3.95	2.31

Source: Survey of Literacy Skills Used in Daily Activities, Statistics Canada, 1989.
Note: Excludes persons who reported having no skills in either of Canada's official languages.
* Total excludes "Not Stated" country of origin.

daily activities. Sixty-five percent of them reached numeracy level 3 which allow them to perform most numeracy operations required in everyday life. In contrast, only 36% of non-official language speaking immigrants achieved reading skills of level 4, and 42% achieved numeracy skills of level 3.

The differences between the mean scores of reading ability and numeracy ability for these two subpopulations are 44.1 and 55.7 respectively (263.8 on reading ability and 259.6 on numeracy ability for official language speaking immigrants compared to 219.7 and 203.9 for non-official language speaking immigrants).

As presented above and illustrated in Table 4.1, it can be stated that Canadian born citizens are more likely to be functionally literate than general immigrants. However, dramatic differences are observed in the general population of immigrants in terms of literacy profiles. Immigrants with English or French as their first langauge apparently have higher reading skills and numeracy skills than the total population. They outperform both Canadian born citizens and non-official language speaking immigrants in terms of all the literacy profiles. Of this subpopulation, 1% more than Canadian born citizens and 31% more than non-official language speaking immigrants are found at reading level 4. Three percent more than Canadian born citizens and 23% more than non-official language speaking immigrants are found at numeracy level 3. Not surprisingly, non-official language speaking

immigrants are less likely than all the other subpopulations to be found at functional literacy levels (reading level 4 and numeracy level 3). Their deficit of functional literacy in Canada's official languages simply bring the national literacy level downwards.

Comparisons Among Canadian Born Citizens and Immigrants in Income

The results of the analysis on personal income of these two sets of subpopulations are somewhat unexpected. For the total population, the mean of income is 3.9834. That is to say, the average income of Canadians is approximately $20,000 to $25,000. Canadian born citizens as a whole subpopulation, have a slightly lower mean income level than the entire population, 3.9543 compared to 4.1187 for general immigrants. Whereas among the immigrants, the official language speaking immigrants have as a mean income level of 4.3695 compared to 3.9493 for the non-official language speaking immigrants. Although the average income for non-official language speaking immigrants is a little lower than that of Canadian born citizens, the difference is negligible (with F-value equals .0042) when the number of weighted cases is reduced to a number exactly corresponding to that of unweighted cases.

However, the estimates of standard deviation for the two subpopulations show that Canadian born citizens (2.2286) have income closer to the mean than do non-official language speaking immigrants (2.3136). At one end, 7% of non-official language

speaking immigrants reported having no income compared to 2.8% of Canadian born citizens. This implies that the rate of unemployment among non-official language speaking immigrants is higher than that of Canadian born citizens. At the other end, 8% of non-official language speaking immigrants have incomes of $50,000 or more while the percentage of Canadian born citizens in this category is 6.5%. It can be inferred that the higher rate of entrepreneurship and the number of self-employed among non-official language speaking immigrants somehow boosted up the average personal income for the whole population.

Among the two sets of subpopulations, official language speaking immigrants, are more successful in terms of personal income than the rest of the subpopulations. On the other hand, there appears to be no statistically significant difference between the personal incomes of non-official language speaking immigrants and those of Canadian born citizens.

Summary

From the comparisons with Canadian born citizens and official language speaking immigrants, it is shown that the target population for this research, i.e., non-official language speaking immigrants, are undoubtedly disadvantaged in functional literacy. This is mainly because of their comparatively limited knowledge of either of the official languages and their presumed lack of

familiarity with the Canadian cultural and social contexts. However, non-official language speaking immigrants, as a whole, seem not to be disadvantaged in terms of personal income compared to Canadian born citizens. Nevertheless, more foreign speaking immigrants reported having no income than did Canadian born citizens.

Multivariate Analyses

Further multivariate analyses focusing on the target population were conducted with ordinary least square procedures in the forms of two developed models. The correlation coefficients between all the variables in the developed models are presented in Table 4.2. The standardized and unstandardized effect parameters for the four literacy variables are displayed in Table 4.3. And the standardized and unstandardized effect parameters for personal income are reported in the form of two steps in the developed models in Table 4.4. More detailed parameter estimates for developed models (Tables A8-A14) as well as basic models (Tables A1-A7) are illustrated in tables presented in Appendix A.

The findings of the analyses in the two developed models will be reported with reference to the basic models in three sections: (i) factors influencing the reading and numeracy abilities of non-official language speaking immigrants in Canada, (ii) factors influencing the functional reading and numeracy achievements

Table 4.2
Correlation Coefficients, Means, and Standard Deviations
for the Variables in the Socioeconomic Model

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. AGE1	-																			
2. AGE2	-.156	-																		
3. AGE3	-.195	-.280	-																	
4. AGE4	-.171	-.245	-.305	-																
5. AGE5	-.190	-.273	-.340	-.297	-															
6. GENDER	-.036	.044	.019	.019	-.051	-														
7. PDIMM1	.130	.252	-.038	-.052	-.227	.029	-													
8. PDIMM2	.178	.014	.143	-.002	-.278	.067	-.329	-												
9. PDIMM3	-.078	-.011	-.060	.127	.005	-.073	-.294	-.268	-											
10.PDIMM4	-.196	-.215	.008	-.060	.375	-.024	-.356	-.325	-.290	-										
11.PDIMM5	-.074	-.107	-.104	.007	.245	-.011	-.135	-.123	-.110	-.134	-									
12.BIRTH1	.012	.097	-.027	.071	-.135	.081	.124	.113	-.072	-.148	-.065	-								
13.BIRTH2	-.072	-.115	.033	.007	.112	-.046	-.151	-.180	-.047	.348	.033	-.112	-							
14.BIRTH3	-.051	-.141	-.093	-.049	.302	.001	-.137	-.177	-.014	.168	.317	-.098	-.133	-						
15.BIRTH4	.035	.005	-.085	-.024	.080	-.022	-.106	.027	-.005	.077	.020	-.056	-.077	-.067	-					
16.BIRTH5	-.046	-.028	.019	-.001	.038	-.048	-.313	-.126	.352	.135	-.025	-.173	-.235	-.206	-.119	-				
17.BIRTH6	.044	-.061	.022	.145	-.134	-.045	.119	.133	-.092	-.138	-.052	-.067	-.091	-.079	-.046	-.140	-			
18.BIRTH7	.082	.166	.055	-.063	-.201	.064	.407	.228	-.197	-.375	-.153	-.199	-.271	-.237	-.137	-.419	-.162	-		
19.PEDUC	.224	.080	.025	-.112	-.146	-.084	.110	.062	-.039	-.106	-.053	.036	.031	.101	.121	-.331	.004	.170	-	
20.EDUCBE	-.190	-.073	.062	.184	-.039	-.106	.244	.059	-.030	-.204	-.151	.118	-.040	-.016	-.024	-.308	.069	.248	.240	-
21.EDUCC	-.214	.202	.058	.017	-.108	-.154	.004	.066	.026	-.034	-.112	.000	-.015	-.005	-.055	-.077	.004	.108	.276	.134
22.ASLEP	.232	.142	.116	-.039	-.367	.034	-.010	.215	-.119	-.100	.030	-.031	.011	-.185	.030	-.136	.071	.203	.245	-.115
23.LANGH	.009	-.088	.148	-.082	-.001	.043	-.357	.026	.112	.167	.140	-.061	.276	.006	.092	.021	-.037	-.195	.173	-.083
24.LANGOUT	.105	.041	.017	.012	-.137	-.026	-.017	.038	-.048	-.007	.058	.003	.111	.017	.072	-.124	.012	.001	.113	.092
25.OCC1	.008	-.121	-.157	-.095	.351	.198	-.052	-.087	-.113	.191	.079	-.057	-.002	.129	.003	.037	-.024	-.071	-.034	-.077
26.OCC2	-.004	.048	-.010	.044	-.073	-.160	.136	-.025	-.016	-.098	.002	.045	-.055	-.015	-.027	-.034	.340	-.114	-.068	.000
27.OCC3	.023	.110	-.033	-.063	-.021	-.288	-.025	.056	.000	-.012	-.030	-.018	-.005	-.013	-.055	.095	-.062	-.012	.005	-.025
28.OCC4	-.068	-.059	-.011	.194	-.072	.055	.083	.054	-.012	-.116	-.014	.310	-.071	-.056	-.023	-.100	.024	.010	-.183	.014
29.OCC5	-.006	-.021	-.078	-.017	.118	-.053	-.052	-.047	.049	.036	.038	-.058	.117	.049	.039	.001	-.056	-.085	-.128	-.102
30.OCC6	.083	-.048	.020	.062	-.094	.117	.061	-.059	.069	-.059	-.019	-.077	.015	-.095	.022	.113	-.059	.014	-.119	-.115
31.OCC7	-.013	.048	.161	-.089	-.113	.222	-.031	.117	-.116	.052	-.056	-.047	.022	-.034	-.023	-.043	.038	.047	.123	.040
32.OCC8	.005	.070	.060	-.011	-.117	-.073	-.072	.030	.044	.005	.004	-.067	-.027	.023	.088	-.048	-.061	.086	.229	.150
33.OCC9	-.089	.031	.070	-.072	.030	-.134	-.057	.009	.057	.009	-.028	-.001	.035	.032	-.065	-.061	-.015	.050	.146	.103
34.RDABIL	.132	.132	.174	-.105	-.286	-.152	-.124	.106	-.010	.037	-.007	-.060	.220	-.001	.092	-.171	.038	-.014	.369	.125
35.NUMABIL	.116	.105	.169	-.079	-.272	-.050	-.114	.103	-.025	.022	.033	-.027	.209	-.004	.093	-.146	.009	-.037	.253	.152
36.LITACH	.139	.064	.130	-.100	-.191	-.177	-.133	.110	-.009	.069	-.064	-.098	.192	.040	.071	-.135	-.033	.003	.322	.086
37.NUMACH	.032	.073	.200	-.146	-.152	-.161	-.175	.135	-.004	.065	-.029	-.140	.188	.011	.023	-.069	-.027	.006	.241	.137
38.INCOME	-.268	-.010	.119	.126	-.046	-.442	-.199	-.049	.179	.061	.067	-.076	.060	.057	-.035	.132	-.033	-.128	.044	.187
MEANS	.098	.183	.259	.211	.249	1.502	.265	.231	.193	.260	.048	.076	.132	.104	.037	.267	.051	.325	6.099	3.325
STD. D.	.298	.387	.438	.408	.432	.500	.441	.422	.395	.439	.214	.265	.338	.306	.189	.442	.221	.469	2.759	1.720

Table 4.2 - Cont'd.
Correlation Coefficients, Means, and Standard Deviations
for the Variables in the Socioeconomic Model

	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37	38.
1. AGE1																		
2. AGE2																		
3. AGE3																		
4. AGE4																		
5. AGE5																		
6. GENDER																		
7. PDIMM1																		
8. PDIMM2																		
9. PDIMM3																		
10.PDIMM4																		
11.PDIMM5																		
12.BIRTH1																		
13.BIRTH2																		
14.BIRTH3																		
15.BIRTH4																		
16.BIRTH5																		
17.BIRTH6																		
18.BIRTH7																		
19.PEDUC																		
20.EDUCW																		
21.EDUCC	-																	
22.ASLEP	.077	-																
23.LANGH	-.096	.268	-															
24.LANGOUT	.001	.231	.321	-														
25.OCC1	-.099	-.181	-.071	-.106	-													
26.OCC2	.040	-.104	-.125	-.054	-.089	-												
27.OCC3	-.001	-.006	-.011	.073	-.113	-.068	-											
28.OCC4	-.101	-.006	-.117	.008	-.141	-.006	-.108	-										
29.OCC5	-.077	-.058	-.064	-.016	-.092	-.055	-.071	-.088	-									
30.OCC6	-.203	-.073	.000	-.047	-.210	-.126	-.161	-.201	-.131	-								
31.OCC7	-.120	.145	.106	.032	-.108	-.065	-.083	-.103	-.067	-.153	-							
32.OCC8	.316	.174	.141	.119	-.162	-.097	-.124	-.154	-.100	-.230	-.118	-						
33.OCC9	.270	.124	.104	.011	-.128	-.077	-.098	-.122	-.080	-.182	-.093	-.140	-					
34.RDABIL	.278	.502	.320	.376	-.219	-.056	.010	-.159	-.081	-.159	.088	.349	.272	-				
35.NUMABIL	.156	.416	.312	.443	-.183	-.063	.041	-.134	-.035	-.149	.135	.257	.189	.839	-			
36.LITACH	.320	.375	.223	.232	-.177	-.031	-.005	-.215	-.047	-.083	.007	.319	.252	.795	.562	-		
37.NUMACH	.288	.323	.284	.223	-.182	-.058	.032	-.162	-.076	-.168	.138	.294	.247	.723	.670	.684	-	
38.INCOME	.340	.084	.217	.112	-.354	-.012	.109	-.016	.051	-.121	-.022	.255	.217	.233	.165	.215	.283	-
MEANS	4.969	2.763	.494	.867	.129	.050	.080	.119	.054	.230	.073	.150	.100	219.714	203.858	.361	.421	3.949
STD. D.	.984	1.316	.500	.340	.335	.219	.271	.324	.226	.421	.260	.357	.300	58.706	98.402	.480	.494	2.232

Note: The key to the mnemonics is provided in Appendix B.

of non-official language speaking immigrants in Canada,
(iii) analysis of the effects on personal income of non-official language speaking immigrants in Canada. The findings will be presented in the same sequence as those of the basic hypotheses in the previous chapter.

Factors Influencing the Reading and Numeracy Abilities of Non-official Language Speaking Immigrants in Canada

Table 4.2 illustrates that the correlation between RDABIL and NUMABIL is significantly high: .839. That means the immigrants who have high scores for reading also tend to have high scores for numeracy, and vice versa. Therefore, the effects of the independent variables on RDABIL and the effects on NUMABIL in the model are probably quite similar as well. Thus, the powerful predictors of RDABIL will probably be strong factors in accounting for NUMABIL. The findings of the ordinary least square regression analysis for this segment of the study are presented in Table 4.3 and Table A8 and A9 in Appendix A.

As hypothesized, reading and numeracy abilities of non-official language speaking immigrants were found to be highly responsive to age cohorts.

In the basic model, the parameter estimate is -.274 for the age and reading ability relationship and -.312 for the age and

Table 4.3
Standardized and Unstandardized Regression Coefficients and R^2s for Immigrant Literacy Variables (Model #1)

Independent Variables	Dependent Variables			
	RDABIL	NUMABIL	RDACH	NUMACH
AGE1	.274***	.309***	.217***	.153**
	(54.033)	(101.998)	(.349)	(.253)
AGE2	.291***	.312***	.142**	.156**
	(44.102)	(79.362)	(.176)	(.199)
AGE3	.267***	.303***	.156**	.165***
	(35.730)	(68.057)	(.171)	(.186)
AGE4	.083*	.115**	.038	-.028
	(11.941)	(27.771)	(.045)	(-.033)
GENDER	-.062*	.034	-.084*	-.086*
	(-7.247)	(6.731)	(-.080)	(-.085)
PDIMM1	-.232***	-.223***	-.165**	-.147*
	(-30.879)	(-49.832)	(-.180)	(-.165)
PDIMM2	-.119*	-.115*	-.025	.018
	(-16.574)	(-26.860)	(-.029)	(.021)
PDIMM3	-.040	-.041	-.048	-.033
	(-6.018)	(-10.189)	(-.058)	(-.042)
PDIMM5	.010	.059	-.074*	-.014
	(2.763)	(27.275)	(-.165)	(-.032)
BIRTH1	-.017	-.003	-.051	-.138**
	(-3.733)	(-1.226)	(-.093)	(-.257)
BIRTH2	.194***	.175***	.174***	.130**
	(33.724)	(51.058)	(.246)	(.189)
BIRTH3	.093**	.072	.125**	.054
	(17.911)	(23.302)	(.196)	(.087)
BIRTH4	.079**	.090**	.055	.002
	(24.495)	(46.541)	(.139)	(.005)
BIRTH6	.053	.019	-.045	.051
	(14.115)	(8.602)	(-.098)	(-.114)
BIRTH7	-.044	-.056	-.054	(-.093)
	(-5.522)	(-11.710)	(-.055)	(-.098)

Note: Unstandardized coefficients in parenthesis.
* p<.05
** p<.01
*** p<.001

Table 4.3-Cont'd
Standardized and Unstandardized Regression Coefficients and R^2s for Immigrant Literacy Variables (Model #1)

Independent Variables	Dependent Variables			
	RDABIL	NUMABIL	RDACH	NUMACH
PEDUC	.077*	-.027	.086*	.007
	(1.643)	(-.974)	(.015)	(.001)
EDUCBE	.184***	.257***	.118**	.195***
	(6.271)	(14.716)	(.033)	(.056)
EDUCC	.130***	.056	.201***	.175***
	(7.788)	(5.559)	(.098)	(.088)
ASLEF	.308***	.229***	.252***	.178***
	(13.743)	(17.146)	(.092)	(.067)
LANGH	-.001	-.001	-.009	.080
	(-.120)	(-.214)	(-.009)	(.079)
LANGOUT	.181***	.269***	.088*	.070*
	(31.341)	(77.795)	(.125)	(.102)
OCC1	-.140***	-.098*	-.134**	-.137**
	(-24.601)	(-28.860)	(-.192)	(-.202)
OCC2	-.074*	-.050	-.029	-.055
	(-19.785)	(-22.400)	(-.064)	(-.123)
OCC3	-.097**	-.024	-.107**	-.073
	(-20.938)	(-8.780)	(-.190)	(-.133)
OCC4	-.134***	-.122**	-.170***	-.100*
	(-24.327)	(-37.000)	(-.251)	(-.152)
OCC5	-.099**	-.043	-.075	-.098*
	(-25.756)	(-18.583)	(-.158)	(-.214)
OCC6	-.160***	-.147**	-.090	-.154**
	(-22.323)	(-34.314)	(-.103)	(-.181)
OCC7	-.061	-.004	-.096*	.025
	(-13.683)	(-1.634)	(-.176)	(.048)
OCC9	.058	.059	.043	.048
	(11.348)	(19.263)	(.069)	(.079)
R Square	.6011	.4983	.4412	.4062

Note: Unstandardized coefficients in parenthesis.
* p<.05
** p<.01
*** p<.001

numeracy ability relationship, both being highly significant with t-values equal to -7.244 and -7.431 respectively at $p<.001$ (see Table A1 and Table A2). Hence, the hypotheses are accepted. Since both the parameter estimates are negative, it can be interpreted that the younger the respondent, the higher the score for reading and numeracy abilities would be expected.

In developed models, 5 dummy variables were created for intensive study, each representing an age cohort. In order to estimate the differential effects of the age cohorts, AGE5 (55-69 years old) was omitted from the equations to be the reference variable.

The relationships between each of the remaining age groups to RDABIL and NUMABIL are all statistically and substantively significant, with reference to AGE5 (55-69 years old), the elderly age group. Among the four independent variables, however, AGE2 (25-34 years old) appears to be the strongest factor in accounting for reading and numeracy ability. The standardized regression coefficients for the path between AGE2 and RDABIL, and for that between AGE2 and NUMABIL are as high as .291 and .312, compared to .083 for AGE4 (45-54 years old) to RDABIL and .115 for AGE4 to NUMABIL. This suggests that non-official language speaking immigrants in the age group of 25-34 years old have higher scores for both reading ability and numeracy ability than all the other age cohorts as well as AGE5. More specifically, the immigrants in

the AGE2 group have average scores on reading and numeracy proficiency that are .92 and 1.03 standard deviations respectively (54.033 points for reading and 101.998 points for numeracy) higher than the average scores for the immigrants in AGE5 group, when all other factors are taken into account.

As for the rest, immigrants in AGE4 perform better than those in AGE5, and AGE3 better than AGE4 and AGE5, and so on. Each age cohort outperforms the following one(s), with only one exception, i.e., AGE2 doing better than AGE1 (16-24 years old). Basic hypothesis 1A, therefore, is accepted, and null hypotheses on these four age variables and literacy abilities are rejected.

It is noted from Table A8 that there is a gender difference in reading ability when taking other factors into account. As expected, it is in favour of men immigrants with a standardized regression coefficient equal -.062. Specifically, men immigrants have an average score on reading that is .12 standard deviation (7.25 points) higher than the average for women immigrants, when other factors being taken into account. However, no significant gender difference can be found in numeracy ability, even though the parameter estimate turns out to be slightly in favour of women immigrants (.034). Thus, the hypothesis about gender difference in reading ability is accepted and that about gender and numeracy ability is rejected. In other words, basic hypothesis 2A is partially accepted.

Period of immigration proved to be quite a strong predictor in the basic model in accounting for literacy abilities of non-official language speaking immigrants, with standardized coefficients as high as .246 for PDIMM and RDABIL and .260 for PDIMM and NUMABIL with $p<.001$ (see Table A1 and Table A2). Therefore, the null hypotheses of no effects are rejected.

In the developed demographic model, 5 dummy variables were created, with PDIMM4 (immigrated to Canada during 1950-1959), the second largest group, dropped off the equations as a reference variable. It is revealed that PDIMM1 (immigrated to Canada during 1980-1989) has significant effects on literacy abilities in a negative way, compared to PDIMM4. The regression coefficients for the PDIMM1-RDABIL and the PDIMM1-NUMABIL are -.232 and -.223 respectively. That is to say, the non-official language speaking immigrants in this category are likely to be disadvantaged in terms of literacy abilities, compared to those who settled down in Canada during 1950-1959. As a matter of fact, the immigrants in PDIMM1 category have average scores on reading and numeracy abilities that are .526 and .506 standard deviations respectively (-30.879 points for reading and -49.832 points for numeracy) less than the average scores for the immigrants in PDIMM4, when other conditions are equal. Table A8 and A9 also illustrate that the immigrants in PDIMM1 category tend to have lower scores in literacy abilities than all those who came to live in Canada during earlier periods.

Another interesting finding is that PDIMM2 (immigrated to Canada during 1970-1979) appears to have negative effects on literacy abilities (-.119 and -.115). These effects are less, however, than PDIMM1 effects. The result of descriptive analysis using an ANOVA procedure shows that the mean scores for the immigrants coming to Canada during the period 1970-1979 are the highest on both reading ability and numeracy ability among immigrants coming into Canada in different periods. Nevertheless, the effects of PDIMM2 changed to negative when all other factors are taken into account. When other conditions are equal, being in this group becomes a disadvantage in terms of literacy abilities, compared to PDIMM4.

The coefficients for the PDIMM3-RDABIL and the PDIMM3-NUMABIL relationships illustrate that the immigrants in this category have higher scores on literacy abilities than PDIMM1 and PDIMM2, but perform a little worse than PDIMM4, though the relationships are less significant when compared to PDIMM4. The immigrants coming to live in Canada prior to 1950 perform better than PDIMM1 and PDIMM2, while its differences between the other two groups are hardly discernible. Therefore, basic hypothesis 3A that other conditions being equal, the longer the immigrant has resided in Canada, the higher his or her literacy abilities will be is basically accepted. However, it is more accurate to state the situation this way: other conditions being equal, the shorter the immigrant has resided in Canada, the less likely he or she is to gain good or average scores

on literacy abilities in English or French; or, alternatively, the lower his or her literacy abilities in one of Canada's official languages tend to be.

World regions of origin (BIRTH) proved to be a predictor which had significant effects on literacy abilities and achievements in the basic models. Table A1 and Table A2 show that the standardized regression coefficients for the BIRTH-RDABIL and the BIRTH-NUMABIL relationships are -.101 and -.111, both being significant at $p<.01$. Thus, the hypotheses about the existence of correlations between BIRTH and literacy abilities are accepted.

Seven dummy variables were created out of world regions of origin in the developed models. The results of the analysis with ordinary least square procedure displayed in Table 4.3 show that three of the six remaining dummy variables, when compared to BIRTH5 (immigrants who were born in Southern Europe), have statistically significant influence on reading ability. Other conditions being equal, the immigrants who were born in Western Europe have an average score on reading ability which is .575 standard deviation (33.72 points) higher than the average score for immigrants born in Southern Europe. In fact, the magnitude of the BIRTH2-RDABIL parameter is the highest of all six parameters. It indicates that the non-official language speaking immigrants who were born in Western Europe are not only superior to the reference group category, but also superior to all the other groups of origin in

terms of reading ability. That finding satisfies basic hypothesis 4A that immigrants who were born in regions with similar cultural background as Canada and high national literacy level will perform better in literacy than those born in other regions, when all other factors are taken into consideration.

The immigrants who were born in Eastern Europe (BIRTH3) and those born in Northern Europe (BIRTH4) have significantly higher scores in reading than the immigrants from the other three regions of origin, compared to BIRTH5. Therefore, three null hypotheses of no relationship are rejected while the other three null hypotheses are accepted.

Similar results are found in the relationships between the six dummy variables of world regions of origin and NUMABIL. The immigrants born in Western Europe have the best results in numeracy ability among non-official language speaking immigrants of different regions of origin, with an average score being .519 standard deviation (51.06 points) higher than that of the reference group, BIRTH5. Those who were born in Northern Europe (BIRTH4) achieve significantly better scores than the rest as well when using BIRTH5 as the reference group. Four null hypotheses are accepted since there are no significant relationships between the remaining four dummy variables and NUMABIL. Unexpectedly, the immigrants born in Asia (part of BIRTH7) show no sign of being advantaged in numeracy ability. Note, however, that BIRTH7 contains

immigrants born both in Asia and Oceania. Note, too, that no difference is made between immigrants born in West Asia centring on the Indian Ocean and immigrants born in East Asia depite their cultural differences. It is not easy to differentiate the true results of immigrants born in Asia from this variable. Thus, basic hypothesis 4A is partly rejected on the ground that immigrants who were born in Asia did not achieve better outcomes in numeracy.

As noted in Chapter Three, province of residence had no significant effects on literacy abilities in the basic demographic model, with the lowest magnitude of the PROV-RDABIL parameter (.019) in the first equation and a low magnitude of the PROV-NUMABIL parameter (.023) in the second equation (see Table A1 and A2). Basic hypothesis 5A is then rejected.

Parental education is a significant factor in accounting for immigrant reading ability. The parameter estimate for the PEDUC-RDABIL relationship is .077, with a significant t-value of 2.348, $p<.05$. However, parental education seems to have no notable influence on numeracy ability, with standardized regression coefficient equal to -.0.27. Therefore, basic hypothesis 6A dealing with the claim that the higher the parental education level, the higher the immigrant reading ability will be is accepted, whereas basic hypothesis 6A, that the higher the parental education level, the higher the immigrant numeracy ability will be is rejected. This observation will be dealt with in further detail in the discussion

section.

Not surprisingly, education before entry proved to be another powerful predictor for immigrant literacy abilities in the models. The standardized regression coefficients for the EDUCBE-RDABIL and the EDUCBE-NUMABIL relationships in the developed demographic model are as high as .184 and .257 respectively, significant at $p<.001$ level. That means the higher the educational level the immigrant achieved in his or her native land before entering Canada, the higher his or her literacy abilities in one of Canada's official languages will be. Basic hypothesis 7A on the above relationships is accepted.

However, it was unexpected to find that only reading ability is responsive to education in Canada, while numeracy ability is not. The parameter estimate for the EDUCC-RDABIL is .130, with t-value equal to 4.140 at $p<.001$, but the magnitude of the EDUCC-NUMABIL parameter is too low to be significant. Therefore, it can be asserted that the higher level of schooling in Canada, the higher the immigrant reading ability will tend to be, but that the higher the level of schooling in Canada does not necessarily result in higher numeracy ability. Basic hypothesis 8B on the effects of EDUCC on NUMABIL is rejected.

The results of the analysis in the basic demographic model presented in Table A1 and Table A2 surprisingly reveal that the

relationships between literacy competency in the first language (LONE) to literacy abilities were not significant, with parameter estimates equal to -.044 and -.015. This finding suggests that the immigrant literacy competency in his or her native language does not have any significantly positive or negative effects on his or her literacy abilities in one of Canada's official languages in the model of this research. In other words, variation of immigrant literacy abilities in the mother tongue is not likely to be the function of literacy competency in the first language, when other predictors are taken into account. Thus, basic hypothesis 9A is rejected. However, it should be noted that this variable is a composite variable indicated by two measures of self assessment. In most cases, respondents tend to overestimate their literacy competency. As was found by Boyd (1991), 76% of females who have only level 1 and 2 of reading skills report that they are satisfied with their reading abilities and the figure for males is 71%. Therefore, the finding may not be accurate due to measurement error.

Similar to other findings of the previous research on immigrant literacy, Table 4.3 illustrates that ASLEF plays a very important role in the immigrant's acquisition of reading skills in an official language.

The magnitude for the ASLEF-RDABIL parameter is .308, the highest in the first equation of the developed demographic model,

with a t-value equal to 9.273 at $p<.001$. As the standardized regression coefficient is positive, it can be inferred that the higher the value of ASLEF, the higher the immigrant reading ability will be. Moreover, since ASLEF is coded from older age cohorts to younger age cohorts, it can be further interpreted that the non-official language speaking immigrants who started learning English or French at a younger age are likely to have significantly higher reading proficiency in that official language than those who started learning the official language at older age cohorts. As well, ASLEF is a powerful predictor in immigrant numeracy ability with the parameter estimate equal to .229. Basic hypothesis 10A on effects of ASLEF on RDABIL and NUMABIL is accepted.

Surprisingly, the lowest magnitudes of the parameter estimates in both equations of literacy abilitites are found to be those for the LANGH (language spoken most often at home)-RDABIL, and the LANGH-NUMABIL relationships. Language spoken at home was hypothesized to account for immigrant literacy abilities, provided by the results of some previous research (Calamai, 1987). But the standardized regression coefficients for the LANGH-RDABIL and the LANGH-NUMABIL are both negligible (-.001) and well below the statistically significant level, after taking other predictors into account. Therefore, what language the immigrant speaks most often at home, whether Canada's official languages or the immigrant's native language, is unlikely to influence his or her literacy proficiency in one of Canada's official languages. The basic

hypothesis 11A on the effects of LANGH on literacy abilities is rejected.

In contrast, language spoken outside the home appears to be a very powerful predictor. The LANGOUT-RDABIL and LANGOUT-NUMABIL relationships are both statistically significant at $p<.001$, with standardized regression coefficients of .181 and .269 respectively. This means that the immigrants who speak English or French most often in daily activities outside the home tend to have higher literacy abilities than those who speak their native language most often outside home, all other factors being equal. Basic hypothesis 12A on the relationships between LANGOUT and literacy abilities is therefore accepted.

Table A1 and Table A2 show that occupation is a significant predictor in the basic demographic model, with the parameter estimate equal to .161 and .109 for its relationships with literacy abilities. As a result, nine dummy variables were created out of occupation in the developed model, ranked from 'not employed' to 'management'. OCC8, professional, was constrained to zero as a reference variable.

Table 4.3 displays the relationships between 8 dummy occupation variables and literacy abilities in the first two equations. Six relationships out of eight dummy variables to reading ability (OCC1-RDABIL, OCC2-RDABIL, OCC3-RDABIL, OCC4-

RDABIL, OCC5-RDABIL, OCC6-RDABIL) are found to be significant when compared to OCC8, the immigrants whose occupations fall into the professional category. The six standardized regression coefficients are all negative, which suggest that the immigrants in these six occupation categories perform less well than the immigrants in OCC8 category on reading ability.

Specifically, those whose occupations fall into the service category have significantly lower scores in reading than those in OCC8 category. Its effect on reading ability is the most significant among the six relationships. The parameter estimate is -.160 with t-value equal -3.952 at $p<.001$. The next significant relationship is found to be the OCC1 (not employed)-RDABIL. Though the magnitude of its standardized regression coefficient (-.140) is less than that of the OCC6-RDABIL, its magnitude of raw regression coefficient is higher (-24.601). That means the immigrants who are unemployed have an average score for reading proficiency even lower than OCC6, other conditions being equal. Compared to the average score on reading for immigrants in OCC8, the average score for the immigrants in OCC1 is .419 standard deviation (-24.601 points) lower, while the average score for the immigrants in OCC6 is .380 of a standard deviation (-22.323 points) less. The higher value of the standard deviation for OCC6 (.421) gives enough explanation of why the magnitude of the OCC1-RDABIL parameter is less than that of the OCC6-RDABIL parameter. A similar case can be found in the OCC4-RDABIL and OCC5 -RDABIL relationships. Compared to the average

score for the immigrants in OCC8 category, the immigrants in primary occupations category have an average score on reading being .262 standard deviation (-25.756 points) lower and the immigrants in skill manual occupations have an average score that is .247 standard deviation (-24.327 points) lower. However, the magnitude of the OCC4-RDABIL parameter (-.134) is significantly greater than that of the OCC5-RDABIL parameter (-.099).

Among 8 dummy variables of occupation, only one category has an average score on reading that is somewhat (.193 standard deviation) greater than that of OCC8, though the difference is not significant. It is OCC9, managerial occupations.

As for numeracy ability, only three out of six relationships are statistically significant. The immigrants in service occupations, skill manual occupations, and unemployed, are likely to have lower scores on numeracy proficiency than that of the immigrants in OCC8 category. The average scores for those occupational groups are at a range of .376 to .293 of a standard deviation lower than the average score for OCC8.

In summary, the immigrants in management and professional occupations tend to have higher scores on literacy abilities than the rest of the occupational groups. Whereas the immigrants whose occupations fall into service and those who are unemployed are likely to have lower scores than the rest, when other factors being

taken into account.

Factors Influencing the Functional Reading and Numeracy Achievements of Non-official Language Speaking Immigrants in Canada

Reading achievement and numeracy achievement are the two proxy variables of reading ability and numeracy ability. Higher average score for a certain variable may not necessarily indicate the corresponding higher percentage of functional literates. Both correlations for RDABIL-RDACH (.795) and NUMABIL-NUMACH (.670) are relatively lower than the corresponding correlations between RDABIL-NUMABIL and RDACH-NUMACH. Further study of the demographic characteristics of literacy abilities in terms of level of functional literacy will reveal in detail what predictors may influence non-official language speaking immigrants' functional literacy in one of Canada's official languages. The findings for this section are expected to be somewhat different from those in the last section. They are displayed in Table 4.3 and Tables A10 and A11 Appendix A as well.

As before, all the variables will be studied in the developed demographic model with a reference to the findings for the basic demographic model.

As expected, the correlation between RDACH and NUMACH is very high. It is .684 as presented in Table 4.2. This suggests that the

immigrants who are functionally literate in reading are likely to be functionally literate in numeracy.

The parameter estimates for the AGE-RDACH and the AGE-NUMACH in the basic model are -.196 and -.205 respectively (see Table A3 and A4), which are quite similar to the results in the last section. The results for the third and fourth equation in the developed model is moderately different from those for the first and second equations. It is shown in Table A10 that the parameter estimate for AGE1 and RDACH relationship is .217 with a t-value of 4.402 at $p<.001$. That means the immigrants in AGE1, the youngest age group of 16-24 years old, are more likely to be functionally literate in one of the Canada's official languages, compared to elderly age group, AGE5. Specifically, 34.9% more immigrants in AGE1 are functional literates than are the immigrants in AGE5. Besides, when compared to the parameter estimates of other age groups to reading achievement, which are .142 for the AGE2-RDACH relationship, .156 for the AGE3-RDACH relationship, and .038 for AGE4-RDACH relationship, the coefficient .217 for AGE1 and RDACH relationship is the highest. Therefore, three more inferences can be drawn here. First, AGE1 group, not AGE2 this time, outperforms all the other age cohorts in dealing with print material effectively in everyday activities. Second, both AGE2 (25-34 years old) and AGE3 (35-44 years old) groups perform better than AGE4 and AGE5 groups in functional literacy. Third, AGE5 group is more likely to be found lacking adequate literacy skills and thus,

unable to function effectively in everyday activities in the Canadian context, though the difference between AGE5 and AGE4 is not statistically significant.

The relationship between age cohorts and numeracy achievement appears a bit more complicated than the previous one. T-values for each of the four age cohorts and NUMACH show that all the relationships of the remaining age groups with NUMACH are significant except the path of the AGE4-NUMACH, compared to the reference variable, AGE5. The parameter estimates reveal that AGE3 has the most significant effects on NUMACH. However, its percentage of functional literates is lower than that of AGE1, compared to AGE5. AGE1 still has higher percentage of functional literates in numeracy than the rest of the groups, 25.3% more than AGE5. And AGE2 are more likely to be functional literate than AGE4 and AGE5 in numeracy. Basic hypothesis 1B that younger age cohorts are more likely to achieve functional literacy than the older age cohorts is supported. Only two null-hypotheses in the AGE4-RDACH and AGE4-NUMACH relationships are accepted.

Gender differences are found to be significant in the literacy achievements of non-official language speaking immigrants. T-values for GENDER-RDACH and GENDER-NUMACH are well into the significant range at $p<.05$. Both parameter estimates are negative, which means that the differences are once again in favour of men. That is to say, male immigrants are more likely to obtain functional literacy

than female immigrants, when other conditions are equal. In fact, 8% more male immigrants are functionally literate in reading and 8.5% more are functionally literate in numeracy than are the female immigrants. The null-hypotheses are rejected and basic hypothesis 2A on gender differences in literacy achievements is supported.

Table A3 and A4 show that period of immigration is another powerful predictor in accounting immigrants reading and numeracy achievements in the basic demographic model. The parameter estimates for the PDIMM-RDACH and PDIMM-NUMACH relationships are .200 and .230 respectively at $p<.001$. As for the 5 dummy variables of period of immigration in the developed model, two relationships between PDIMM1-RDACH and PDIMM5-RDACH are statistically significant, with PDIMM4 being constrained to zero as a reference variable (see Table 4.3 and Table A10 and A11). The negative signs for all four parameters indicate that all the four remaining groups perform less well in RDACH than the immigrants who came to live in Canada in 1950-1959, statistically significant or not. The functional literates (in reading) among the immigrants who came to Canada in the last decade (PDIMM1) are 18% less than the number of functional literates for the immigrants who came to Canada during the period of 1950-1959 (PDIMM4). Surprisingly, the immigrants in PDIMM5 (prior to 1950) category, who perform as well as those in PDIMM4 on reading ability, turn to have a percentage of functional literates (in reading) significantly less than that of PDIMM4. Specifically, the functional literates in PDIMM5 is 16.5% less. In

the relationships with NUMACH, only one is found significant: the PDIMM1-NUMACH parameter is -.147 with t-value equal to -2.258, $p<.05$. Those who are functionally literate in numeracy in PDIMM1 category are 16.5% less than that for PDIMM4. Basic hypothesis 3B that other conditions being equal, the longer the immigrant has resided in Canada, the higher his or her literacy achievements will be cannot be accepted totally here, with some 'exceptions' like PDIMM5-RDACH parameter. However, the immigrants in PDIMM1 category consistently perform the least well among the five groups. It suggests that other conditions being equal, the shorter the immigrant has resided in Canada, he or she is less likely to be functionally literate in one of the Canadian official languages.

In the basic model, world region of origin is significant predictor for RDACH, with the parameter estimate equal to -.073, but it is an insignificant factor in the equation 4 for NUMACH. However, when world region of origin is entered into the equations in the developed model in the forms of specific birth region groups, two relationships out of six in each equation are statistically significant, when compared to the reference group: BIRTH5 (Southern Europe). The standard regression coefficients for the BIRTH2-RDACH and BIRTH3-RDACH relationships are .174 and .125 respectively at $p<.001$ and $p<.01$. 24.6% more immigrants born in Western Europe (BIRTH2) are functionally literate in reading than immigrants born in Southern Europe, and 19.6% more immigrants born in Eastern Europe (BIRTH3) are functionally literate in reading

than those in the BIRTH5 category. The immigrants who were born in Western Europe outperform all the other origin groups in numeracy achievement as well. There are 18.9% more functionally literates in numeracy in BIRTH2 than that in BIRTH4. However, the immigrants who were born in South America (BIRTH1) are more likely to have limited functional numeracy skills. It has a negative parameter to NUMACH and its percentage of functional literates in numeracy is 25.7% less than that of BIRTH5. On the whole, the immigrants born in Western Europe perform consistently well in literacy abilities and achievements, and therefore, basic hypothesis 4B is supported on the part that immigrants who were born in the regions with similar cultural background as Canada and high national literacy level, e.g., Western Europe, will perform better in literacy than those born in other regions.

Province of residence once again proves to be an insignificant factor in influencing reading achievement and numeracy achievement in the basic demographic model, with the parameter estimates for the PROV-RDACH and PROV-NUMACH relationships equal to .009 and .002 respectively. Basic hypothesis 5B is rejected. (In the further analysis at the beginning of the second stage that is not reported, the results showed that none of the relationships between the six dummy variables of province of residence to the literacy variables were significant.) Therefore, this variable (as well as the set of dummy variables) is eliminated from the developed model later at the second stage.

All the three education variables, parental education, education before entry, and education in Canada, are significant predictors accounting for the variance in reading achievement. All the three basic hypotheses (6B, 7B and 8C) on the causal effects of the three variables on functional literacy in reading are accepted. Not surprisingly, among the three independent variables, eduction in Canada (EDUCC) turns out to be the most powerful factor to influence immigrant functional literacy in reading, with the parameter equal to .201 at $p<.001$. As for effects on numeracy achievement, two out of the three are significant. The exception is parental education. The magnitude of the EDUCBE-NUMACH parameter (.195) is slightly higher than that of EDUCC-NUMACH parameter (.175). This suggests that education before entry may be a stronger factor in influencing immigrant functional numeracy even than education in Canada. Therefore, part of basic hypothesis 7D is rejected; namely, that education before entry will be a less powerful determinant in immigrant literacy abilities and functional numeracy, compared to education in Canada. In fact, education in Canada is only a more powerful predictor in accounting for immigrant functional literacy in reading in the developed demographic model. Basic hypothesis 8A is only accepted on this part.

Table A3 illustrates that literacy competency in the first language has a significantly negative effect on immigrant reading achievement in the basic model. The standardized coefficient for

the LONE-RDACH relationship is -.137 with t-value as -3.556 at $p<.001$. This finding is contradictory to the current belief that competency in the first language has a positive effect on one's competency in the second language. As for the LONE-NUMACH parameter (-.005), it is insignificant at $p>.50$. Basic hypothesis 9B that literacy competency in the first language will have a positive effect on immigrant literacy achievements is rejected. Moreover, since this variable is insignificant for most of the equations in the basic model, like PROV, it too is eliminated from the developed models. The findings on the effects of LONE on literacy variables will be further addressed in the conclusions.

Of the three language predictors, two have significantly positive effects on immigrant reading achievement and numeracy achievement as well. They are age when starting learning English or French and language spoken outside the home. The parameter estimates for the ASLEF-RDACH and LANGOUT-RDACH are .252 and .088 respectively at $p<.001$ and $p<.05$. The ASLEF-NUMACH and LANGOUT-NUMACH parameters are .178 and .070 at the same significant p-level as above. It is expected to find that ASLEF is a more powerful predictor than the rest language predictors. But it is somewhat surprising to find that language spoken most often at home does not play an important role in immigrants' acquisition of literacy abilities and literacy achievements. Basic hypotheses 10B and 12B about positive effects of ASLEF and LANGOUT on literacy achievements are accepted, while basic hypothesis 11B that the

immigrants who speak English or French most often at home are more likely to be functionally literate than those who do not is rejected.

In the basic demographic model, occupation is a strong factor in influencing the reading and numeracy achievements (see Table A3 and A4). In the developed demographic model, half of the eight variables have significant effects on reading and numeracy achievements, compared to the reference group, OCC8. Among the significant relationships between OCCnth-RDACH, the most significant parameter is found to be that for the OCC4 (skill manual)-RDACH path, -.170. The unstandardized regression coefficient suggests that the immigrants whose occupations fall in skill manual category have 25% lower functional literates than the immigrants in professional category. The most powerful predictor among the eight independent occupation variables for NUMACH is found to be OCC6 (service). The parameter is -.154 which is significant at the $p<.01$ level. Furthermore, the immigrants who are unemployed are found to perform consistently less well on all the criterion variables. They have 19.2% lower functional literates in reading than the immigrants in OCC8 and 20.2% lower functional literates in numeracy than OCC8. On the other side, the immigrants in OCC8 (professional) and in OCC9 (management) are more likely to be functionally literate (both in reading and numeracy) than the remaining occupational groups. Therefore, basic hypothesis 13B that immigrant literacy achievements are functions of the immigrant

occupation is accepted.

Analysis of the Effects on Personal Income of Non-official Language Speaking Immigrants in Canada

What effects will the social and demographic factors have on the income of the immigrant when controlling for literacy abilities and achievements? In this section, the question is addressed through analysis of effects on personal income within the developed socioeconomic model. The standardized and unstandardized regression coefficients and R squares for immigrant personal income are reported in Table 4.4. Detailed statistical information on parameter estimates can be found in Tables A12-A14 in Appendix A. Reference will also be made from the analysis of the basic socioeconomic model when necessary.

Table 4.2 illustrates that there are significantly high correlations between literacy abilities and personal income, and between literacy achievements and personal income as well. The RDABIL-INCOME and NUMABIL-INCOME correlations are .233 and .165 respectively. And the RDACH-INCOME and NUMACH-INCOME correlations are .215 and .283. They all have positive values. This suggests that literacy abilities and achievements have positive effects on the immigrant personal income, when other factors are not taken into account. However, when these four literacy variables entered the socioeconomic model as intervening variables, their effects on

Table 4.4
Standardized and Unstandardized Regression Coefficients and R^2s for Immigrant Financial Income (Model #2)

Independent Variables	Dependent Variable INCOME Step 1	Step 2 (A)	Step 2 (B)
AGE1	-.159***	-.140**	-.155***
	(-1.194)	(-1.047)	(-1.164)
AGE2	-.006	.014	-.006
	(-.037)	(.080)	(-.037)
AGE3	-.031	.051	.032
	(.159)	(.257)	(.161)
AGE4	.086*	.092*	.089*
	(.468)	(.505)	(.485)
GENDER	-.355***	-.356***	-.355***
	(-1.585)	(-1.587)	(-1.586)
PDIMM1	-.048	-.063	-.050
	(-.243)	(-.320)	(-.251)
PDIMM2	-.029	-.037	-.031
	(-.153)	(-.194)	(-.164)
PDIMM3	.012	.009	.011
	(.066)	(.051)	(.061)
PDIMM5	.052	.054	.049
	(.538)	(.564)	(.506)
BIRTH1	-.127***	-.127***	-.123**
	(-1.068)	(-1.074)	(-1.037)
BIRTH2	-.126***	-.114**	-.123***
	(-.832)	(-.750)	(-.813)
BIRTH3	-.026	-.021	-.022
	(-.191)	(-.151)	(-.163)
BIRTH4	-.094**	-.088**	-.091**
	(-1.106)	(-1.039)	(-1.074)
BIRTH6	-.101**	-.099**	-.101**
	(-1.023)	(-.999)	(-1.022)
BIRTH7	-.210***	-.213***	-.208***
	(-1.000)	(-1.016)	(-.993)
PEDUC	-.005	-.004	-.001
	(-.004)	(-.003)	(-.001)
EDUCBE	.154***	.169***	.151***
	(.199)	(.219)	(.195)
EDUCC	.231***	.237***	.233***
	(.524)	(.537)	(.529)

Note: Unstandardized coefficients in parenthesis.
* p<.05
** p<.01
*** p<.001

Table 4.4-Cont'd
Standardized and Unstandardized Regression Coefficients and R^2s for Immigrant Financial Income (Model #2)

Independent Variables	Dependent Variable INCOME Step 1	Step 2 (A)	Step 2 (B)
ASLEF	.071	.089*	.076*
	(.121)	(.151)	(.129)
LANGH	.185***	.185***	.181***
	(.827)	(.826)	(.809)
LANGOUT	.017	.033	.018
	(.112)	(.214)	(.121)
OCC1	-.254***	-.262***	-.254***
	(-1.691)	(-1.743)	(-1.694)
OCC2	-.067	-.071	-.066
	(-.681)	(-.723)	(-.671)
OCC3	-.031	-.035	-.033
	(-.254)	(-.285)	(-.271)
OCC4	.003	-.005	-.001
	(.022)	(-.037)	(-.006)
OCC5	.031	.027	.032
	(.308)	(.263)	(.315)
OCC6	-.069	-.079	-.066
	(-.365)	(-.420)	(-.352)
OCC7	.022	.020	.016
	(.190)	(.173)	(.138)
OCC9	.012	.016	.011
	(.087)	(.116)	(.087)
RDABIL		-.030	
		(-.001)	
NUMABIL		-.037	
		(-.001)	
RDACH			-.050
			(-.235)
NUMACH			.046
			(.206)
R Square	.5190	.5208	.5203

Note: Unstandardized coefficients in parenthesis.
* p<.05
** p<.01
*** p<.001

personal income changed dramatically.

In the basic socioeconomic model, none of the literacy variables is a significant predictor except RDACH. It has a negative parameter, -.101, with a t-value equal -2.241 at $p<.05$. This implies that being a functional literate (in reading) in one of the Canadian official languages does not help the immigrant to gain higher income. On the contrary, he or she is more likely to be disadvantaged in terms of income. The raw regression coefficient for the RDACH-INCOME suggests that the immigrants with functional literacy in reading have an average income .211 standard deviation (-.471 point) less than the average income of those who have limited functional reading skills in English or French, when other factors taken into consideration. RDABIL also has a negative regression coefficient for personal income.

The dropping of two exogenous variables (PROV and LONE) and the substitution of four sets of dummy variables for the four independent variables in the developed model, however, reduced the negative effects of reading achievement as well as reading ability. RDACH is no longer a significant predictor in the developed socioeconomic model. The magnitude of its standardized regression coefficient decreases to -.050. The parameter estimates for the NUMABIL-INCOME and NUMACH-INCOME relationships are -.037 and .046 respectively.

Tables 4.4 present the standardized and unstandardized effect parameters for personal income in the form of two steps. In step 1, the effects of the independent variables are reported. The intervening variables, literacy abilities and achievements, are not included in the equation for step 1. In step 2A, the fully recursive effect parameters are reported when literacy abilities are included. And in step 2B, the parameters are displayed when literacy achievement are added to the equation. When the literacy variables enter the equation as intervening variables, the effects of exogenous variables have been mediated by endogenous variables. As literacy abilities and achievements are proxies for one another, they are included into two equations separately to avoid the problem of multicollinearity.

Among the four age variables, two are significant in all steps, compared to the reference group, AGE5. The immigrants in the youngest age group are apparently disadvantaged in personal income, probably due to lack of working experience. Before the literacy variables are added to the equation, the effect of AGE1 is -.159 in step 1. The average income of this group is .535 standard deviation lower than the average income for AGE5. As hypothesized, the immigrants in the middle age group, AGE4, are better off in terms of personal income than the rest of groups as well as AGE5. Its effect on income is .086, significant at the $p<.05$ level. They have an average income that is .210 standard deviation higher than that of AGE5. Therefore, basic hypothesis 1C is fully accepted.

When the literacy variables are added in step 2, the negative effect of being in the youngest age group are decreased and the positive effect of being in the middle age group increased (see Table 4). That suggests the negative effects of the literacy variables except NUMACH (.046) on personal income, though not statistically significant, restrain the effects of AGE on income.

Gender turns out to be the most powerful predictor in accounting for personal income in the developed socioeconomic models. The effect parameter is -.355 in step 1 with a t-value equal to -10.511 at $p<.001$. The negative sign indicates that the significant gender difference is in favour of men immigrants. The average income for female immigrants is .710 standard deviation (-1.585 points) lower than the average income for male immigrants. The effect of Gender on income in step 2B with literacy achievements as intervening variables is exact same as its effect in step 1. The other effect in step 2A with literacy abilities as intervening variables is only .001 higher in magnitude. This means the effects of gender via literacy variables on personal income are actually not in existence or extremely limited. Thus, basic hypothesis 2C that the gender difference in immigrant personal income is greater than in literacy abilities and achievements and that women immigrants are likely to be significantly disadvantaged in terms of personal income is fully accepted.

In the developed socioeconomic model, none of the <u>period of</u>

immigration variables has significant effects on personal income, compared to PDIMM4. Adding the literacy variables to the equation does not change the effects significantly. The null hypotheses for the four paths are accepted. And basic hypothesis 3C that the immigrant income is expected to have a positive linear relationship with the period for which he or she has lived in Canada is rejected.

However, five out of six dummy variables of world regions of origin appear to have significant effects on personal income, in a negative way, compared to the reference variable, BIRTH5, in the developed models. All the relationships between six dummy variables of world regions of origin and personal income are negative, which indicates that the immigrants in the reference group, those who were born in Southern Europe, are better off than the rest of groups.

The most significant relationship is found between BIRTH7 and INCOME. The effect of BIRTH7 on INCOME in step 1 is -.210 with a t-value of -4.275 at $p<.001$. The average income of the immigrants born in Asia and Oceania, who are likely to be a 'visible minority', is .448 standard deviation (-1.00 point) lower than the average income for BIRTH5. The effects of BIRTH7 on income via literacy abilities and achievements are almost negligible. Specifically, the effects of BIRTH7 in steps 2A and 2B, (with literacy abilities added to 2A and literacy achievements added to

2B), are not much different from its effects in step 1 (-.210 in step 1, -.213 and -.208 in steps 2A and 2B respectively). Being functionally literate or not influences little their personal income.

The immigrants born in South America (BIRTH1) and Africa (BIRTH6) tend to be disadvantaged in personal income as well. The effects of BIRTH1 and BIRTH6 on INCOME in step 1 are -.127 and -.101 respectively. Therefore, basic hypothesis 4C is generally accepted.

However, the magnitude of the effect (-.126) of BIRTH2 (the immigrants born in Western Europe) is not any less than that of the two groups. It is noteworthy to see that the change in the magnitude of the effect for BIRTH2 when literacy abilities are added to the equation is relatively greater. The negative effect of BIRTH2 is reduced to -.114 in step 2A. That means Western Europe immigrants do not appear to be advantaged in terms of personal income, and being an immigrant with higher average of reading and numeracy skills is not an advantage, either, compared to the immigrants who were born in Southern Europe. Some other effects may govern the average income of BIRTH2.

Parental education does not seem to be a significant predictor in accounting for personal income in the model. Table 4.2 indicates that the correlation between PEDUC and INCOME is not significant,

either (.044). Basic hypothesis 6C cannot be supported. The null hypothesis is therefore accepted.

The parameters for the other two education variables to personal income are statistically significant. Both have positive effects on personal income. This suggests that the higher the level of schooling, completed in the immigrant's native land or in Canada, the higher income he or she will earn. Furthermore, Education in Canada appears to be more powerful than education before entry. The effect of EDUCC is .231 compared to .154 for EDUCBE in step 1. However, the effects for both are high. Though the negative effects through literacy variables slightly reduce the positive influence of these two education variables on personal income, the relationships are still highly significant at $p<.001$. Therefore, accepted are basic hypotheses 7C that education before entry has a positive effect on personal income, and 8D that personal income is highly responsive to education in Canada. Furthermore, basic hypotheses 7D and 8A are partially accepted on the difference in the effects of EDUCBE and EDUCC on INCOME.

Examining the effects of the three language variables on personal income in step 2A and 2B, two of them appear to be significant. The effect parameter for age starting learning English or French is .089 in step 2A, $p<.05$, and it is .076, significant at the $p<.05$ level in step 2B. However, the effect of ASLEF at step 1 is at a level of insignificance, $p>.05$ (see Table 4.4). In this

case, the intervening influence of the literacy variables is somewhat significant. Note that the literacy variables virtually suppress the relationship between age starting learning English or French and income. Basic hypothesis 10C that ASLEF has a significant effect on personal income other conditions equal is not fully supported in the developed models.

Another significant relationship is found between LANGH and INCOME. The effect parameter of the LANGH-INCOME in step 1 is .185, which is statistically significant, $p<.005$. Since LANGH does not have significant influence on literacy abilities or achievements, the indirect effects via the literacy variables are almost null. Its effects on income are .185 and .181 respectively at steps 2A and 2B. Basic hypothesis 11C is accepted that the immigrants who speak English or French most often at home tend to have better communicative skills in that language which will enable them to earn high income.

As there is no significant relationship found between LANGOUT and INCOME, basic hypothesis 12C is rejected.

Out of 8 dummy variables of occupation, somewhat unexpectedly, only one is found to have a significant effect on personal income, when compared to the reference group, OCC8. It is OCC1, the group of the unemployed immigrants. Its effect parameter in step 1 is -.254 with a t-value equal to -6.161 at $p<.001$. The immigrants in

this group have an average income that is .758 standard deviation lower than the average income for the immigrant in the category of professional occupation. They are significantly disadvantaged in terms of personal income. One direct reason for that is their unemployment. The effects of OCC1 are equal to -.262 at step 2A and -.254 at step 2B. The influence of the literacy variables in the path is not strong enough to change the effects of OCC1. Basic hypothesis 13C is only partially accepted. Seven null hypotheses for the rest seven relationships are accepted.

Reviewing the independent effects of intervening variables and the effects of independent variables via literacy variables, it is apparent that the impact of the literacy variables on personal income is not significant, when controlling for demographic and socioeconomic predictors. Basic hypothesis 14A is thus accepted. On the whole, the literacy variables only mediate marginal proportions of the effects of the independent variables on personal income, since the independent effects of the literacy variables on personal income are not statistically significant. Besides, "the higher the literacy abilities and achievements in English or French, the less the negative effects of the demographic and socioeconomic predictors will exert on income, in turn, the higher the income will be" is not supported by the findings. Therefore, basic hypothesis 14B is rejected.

Discussion of Findings

All the findings have been reported in reasonable detail in the above sections. In this section, the findings will be further discussed in order to address all the basic research questions. The discussion will be carried on within the context of the two developed models, namely, demographic and socioeconomic models.

Effects of Personal Predictors

In the developed demographic model, AGE cohorts are the most powerful group of predictors in accounting for the variation of literacy abilities and three of the four are very strong factors in determining literacy achievements: immigrant functional literacy. The younger age cohorts have higher literacy abilities and achievements than older age cohorts. What interpretation can be drawn from the effects of age variables then? As known, Age cohorts are proxies in which they reflect something else. Within the demographic model, they mirror the characteristics of education, language and period of immigration. Outside the model, they reflect the quality of schooling, educational opportunity, and immigration policies in different periods. The correlation matrix displayed in Table 4.2 provides relevant information on this concern.

Firstly, it is interesting to note that parental education varies negatively with AGE. For the elderly age group, the level of

their parental education is the lowest, with a simple correlation coefficient of -.146; whereas for the youngest age cohorts, the level of parental education is the highest, with a simple correlation coefficient equal to .224. The differences in correlations between age cohorts and parent education reflect the differences of the provision of educational opportunities and the quality of schooling at different times and different places. The provision of educational opportunities and educational attainment at the time when parents of the immigrants in AGE5 went to school (the first two decades of this century) were definitely inferior to those available for parents of AGE1 group after World War II.

Parental education is shown to be a significant predictor in determining children's (immigrants') reading ability and achievement. This finding has been supported by a great deal of empirical research. Most of educated and literate parents try to transmit their own competencies, literacy skills and abilities to their children. They have high expectation from their children. More importantly, they endeavour to create positive educational home environment and provide educational resources for the next generation. As a result, their children are more likely to be literate and well educated. Therefore, the immigrants in younger age cohorts perform better in literacy abilities and achievements, especially in reading, than older age cohorts. AGE1 is the best example. Even though their level of educational attainment in their native land before entry or in Canada does not appear as high as

that of the other groups, they have benefited a great deal from the high level of their parental education; that is, from good educational resources of home.

Secondly, younger age cohorts, except AGE1, have relatively high correlation with education before entry or education in Canada, two powerful predictors in accounting for immigrant literacy abilities and achievements. The immigrants aged 25-34 (AGE2) tend to have completed higher levels of schooling in Canada (.202). In contrast, the immigrants in the AGE5 group are likely to have lower levels of educational attainment than the younger age groups, no matter whether in their native country or in Canada. Once again, an important cause for the difference in educational attainment among age cohorts is the difference in the provision of educational opportunities at different times and in different countries when the corresponding age cohorts went to school. In general, regardless of the difference of places, the younger age cohorts are likely to have been provided better educational opportunities than are the older age cohorts. Another characteristic feature reflected by age cohorts already mentioned above is the quality of schooling at different times and places. The quality of schooling in the last three decades when AGE1 and AGE2 attended schools was superior to that received by AGE4 and AGE5 before, during or just after World War II. That is probably why the immigrants in AGE4 group perform less well in literacy abilities and achievements even though they seem to have relative

higher level of educational attainment in their native country before entry.

Thirdly, age cohorts mirror the effects of language variables. Age when starting learning English or French is one of the strongest factors in influencing immigrant literacy abilities and achievements in the demographic model. Fascinatingly, ASLEF also varies negatively as AGE cohorts. The simple correlation coefficient for ASLEF and AGE1 is .232 and declines monotonically to -.367 for ASLEF and AGE5. Obviously, many immigrants in AGE5 started learning English or French at a later age than the immigrants in AGE1, or AGE2, or AGE3. It was more difficult for them to acquire literacy in English or French through formal education. That is the reason why they are more likely to speak their native languages rather than English or French, at home or outside the home. All these correlate with their lower literacy abilities and achievements in one of the Canadian official languages.

Last but not the least, age cohorts reflect the period of immigration and change of the immigration policies in that period. As noted in Chapter One, immigration policies changed greatly in 1960's. The point system was established in 1967 in the Immigration Act, with education, skill, occupational demand and knowledge of English or French as main criteria. From the correlations of PDIMM groups and AGE cohorts, it is depicted that most of the younger age

cohorts came to live in Canada after the period of 1960-1969, and most immigrants in AGE5 immigrated to Canada before the period of 1960-1969. Therefore, many immigrants in the younger age cohorts were selected by the point system, who may have certain advantages in terms of education and knowledge of English or French than those in AGE5.

Given the above interpretation, why age cohorts have powerful effects over-and-above most of other predictors on immigrant literacy, especially literacy abilities, in the demographic model is not surprising.

Significant gender difference in favour of male immigrants in functional literacy reflects the inequality of gender in social status. Table 4.2 illustrates that the correlation coefficients between gender and three education variables are all in favour of men. Women immigrants obviously have less educational opportunities than men do. Due to the traditional boundary of female roles in families and society, significantly more women immigrants are unemployed. Women immigrants are over-represented in service and clerical occupations. They are significantly under-represented in professional and managerial categories. Significantly lower educational attainment, fewer educational resources at home, prejudice against women in opportunities of occupation and modest requirements for literacy in some of the occupations in which women are found over-represented may account for women immigrants'

disadvantage in literacy.

The findings illustrate that having lived in Canada for quite a long time may not necessarily be advantageous in terms of functional literacy, other conditions equal. Coming to Canada recently, then, is definitely a disadvantage in becoming functionally literate in one of the Canadian official languages. This is because the immigrants who came to Canada recently are less likely to have adequate exposure to English or French, and most importantly, they lack the knowledge of Canadian social, cultural and economic contexts. Yet, every immigrant has to experience this initial period. Raising the level of schooling in the native country, gaining knowledge of English or French before entry, receiving formal education in Canada may help reduce the possible negative effects of period of immigration on immigrant functional literacy.

Effects of Social Context Predictors

Literacy abilities and achievements are responsive to world regions of origin. The significant difference of world regions of origin in literacy abilities and achievements mirror the differences of world regions in culture, language, and provision of educational opportunities. The immigrants who were born in the regions where the culture is close to Canadian culture, or where the language used falls into the same linguistic family as English

or French and employs the Roman alphabet, or there is better provision of educational opportunities are likely to be functional literacy in one of the official languages. This is the case for most European immigrants. For immigrants born in South America, Africa, and Asia, even if they have higher percentage of well educated, they also have higher percentage of the under-educated, due to having fewer educational opportunities and relatively lower national levels of literacy in the regions they were born. Another important reason is that their mother tongues do not employ the Roman alphabet and the rhetorical systems of their languages, especially Asiatic languages, are very different from the English or French systems (Read & MacKay, 1984). The radical linguistic difference between their mother tongues and the Canadian official languages impose greater difficulties in the process of literacy in one of the official languages for those immigrants.

Effects of Educational Predictors

The effects of parental education on immigrant literacy abilities and achievements deserve further discussion here, though it is not one of the most powerful predictors. As noted before, parental eduction is a significant predictor for reading ability and achievement, but not for numeracy ability and achievement in the model. Nevertheless, Table 4.2 shows that PEDUC has highly significant correlations with all the four literacy variables, independent of the influence of other predictors. The correlation

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Language spoken outside the home is a very powerful determinant for literacy abilities and a significant predictor for literacy achievement. It has high correlations with ASLEF and most important, it reflects the needs and opportunities to use one of the official languages in the activities outside the home. Those who speak English or French most often outside home tend to be those whose occupation requires speaking English or French or those who take part in lots of social activities require one of the official languages as communicative medium. The correlation coefficients for LANGOUT and OCC variables show that those who speak English or French most often outside home are more likely to be engaged in the occupations like construction, clerical, professional and management. Those occupations have comparatively higher requirements for literacy. More exposure to English or French and more involvement in the use of one of the official languages in the Canadian social context reinforce literacy abilities and then literacy achievements.

The predictor which literacy abilities and reading achievement found to be least responsive to in the model is also a language variable: language spoken most often at home. Unlike LANGOUT, LANGH reflects mainly the needs to speak one of the official language at home. LANGH has high correlations with PDIMM3, PDIMM4, and PDIMM5. The immigrants coming to Canada during those three periods are likely to have the second or third generation born in Canada. In most cases, the need to speak English or French at home generated

from the second or the third Canadian born generation. The second and third generations of immigrants are likely to speak English or French at home. Therefore, their immigrant parents communicate with them in that languages most often at home, literate or not. This may explain why LANGH is not a significant predictor in the model.

Effects of the Socioeconomic Predictor

Occupation is a strong determinant for literacy abilities and achievements because it mirrors the requirements for level of education attainment and literacy. Table 4.2 shows that the immigrants who are unemployed are likely to be under-educated, or to have less knowledge of English or French, or to be elderly. Therefore, they are less likely to perform well in literacy. The immigrants whose are engaged in managerial and professional occupations are more likely to be better educated, well established (having lived in Canada for more than ten years), or have better knowledge of one of the official languages. As a result, they are more likely to be functionally literate.

Effects of Predictors on Income

The most powerful predictor in the developed socioeconomic model is gender. Women immigrants are significantly disadvantaged in personal income, which reflects great gender inequality in socio-economic status. Women are more likely to be engaged in jobs

with lower or lowest pay. The two occupations in which women immigrants are over-represented all have negative correlations with income. The pay for service jobs is the lowest among all the occupational categories except for the group of unemployed. The inequality of gender is significant here.

Education in Canada is the next most powerful determinant of income. Education and income are likely to be highly correlated especially in industrialized countries. Education is often one's index of income. Because education in Canada is more valued and credible than education in other countries before entry, it affects immigrant personal income over-and-above the effects of education before entry, though education before entry is also a significant predictor.

BIRTHnth are a group of strong factors in determining personal income. Though the immigrants born in South America, Africa and, Asia and Oceania appear to have higher level of educational attainment than the European immigrants (see Table 4.2), they are disadvantaged in income. BIRTH2 also has significantly negative parameter coefficient with INCOME. However, that may be explained by its high correlations with AGE5. This indicates that the immigrants born in Western Europe are likely to have a comparatively high percentage of elderly aged persons who are retired and disadvantaged in income. Therefore, the variation by world region of origin implies ethnicity inequality in income.

The only significant predictor found in OCCnth group is OCC1 when OCC8 (professional) was dropped to be the reference variable. However, it is not surprising that the rest of the occupation variables are not significant determinants for income when other powerful determinants, like education, origin and language, are taken into account.

None of the variables of period of immigration are strong factors when PDIMM4 was omitted in the equations. Though period of immigration may mirror the immigrant's life experience and work experience in Canada, which are important to one's income, education, language, and origin have fundamentally important effects over-and-above that effect.

Finally, literacy abilities and literacy achievements have no independent effects on income in the model when other predictors taken into account. The personal income of the immigrant is not influenced by his or her literacy abilities or achievements. Functionally literate immigrants are barely advantaged and sometimes even under-paid given other conditions equal. Immigrants who have limited literacy skills in one of the official languages are hardly disadvantaged.

CHAPTER FIVE

Conclusions

This final chapter provides conclusions to the study in the form of four sections: (i) the summary of the findings; (ii) the theoretical implications; (iii) the practical implications; and (iv) the possibilities for further studies.

The first section mainly addresses the leading research questions by summarizing the findings, i.e., what are the major determinants of the functional literacy competencies of Canadian foreign speaking immigrants? What are the effects of the immigrant functional literacy, in turn, when controlling for the social and demographic variables, on the income of those foreign speaking immigrants? The second section is concerned with confirmation and clarification of the theories discussed in Chapter Two, given the findings of the research. There are also practical implications of the findings in terms of immigration policy and immigrant literacy education. Last but not the least, recommendations are made for the further study on immigrant literacy, using the same data from the Survey of Literacy Skills Used in Daily Activities.

Summary of the Findings in the Study

What are the major determinants of the functional literacy competencies of Canadian foreign speaking immigrants? In short, the major determinants for literacy abilities are found to be the followings: age when starting learning English or French, age cohorts, education before entry, period of immigration, language outside home, world regions of origin, and occupation. Education in Canada, gender and parental education only account for reading ability.

The powerful predictors in accounting for literacy achievements are age when starting learning English or French, age cohorts, education before entry, education in Canada, language outside home, gender, period of immigration, world regions of origin, and occupation. Parental education only determines the variation of reading achievement, but not numeracy achievement.

Generally speaking, the immigrants who are more likely to be functionally literate are those who started to learn English or French at a earlier age (before 15); those who are in the younger age cohorts (below 45); those who achieved secondary school level of education attainment or up in their native countries before entry; those who completed secondary school level of education or up in Canada; those who speak one of the official languages most often in daily activities outside home; or those who have

occupations in managerial, professional categories. At the other end, other conditions equal, the immigrants who tend to have limited functional literacy skills are those who are elderly, those who came to live in Canada recently, those who are unemployed or have jobs in construction or services. The immigrants are comparatively more advantaged if their parents have a high level of schooling, or if they are from Europe and use Roman alphabetic languages. Women immigrants are relatively disadvantaged and tend to have more difficulties in dealing with printed materials in daily activities due to inequality of gender in social status.

What are the effects of immigrant functional literacy, in turn, when controlling for the social and demographic variables, on the income of those foreign speaking immigrants? The findings show that immigrant functional literacy has no significant direct-effects on immigrant personal income, when other social and demographic factors being taken into account. As intervening variables, therefore, their influences are too weak to change much of the effects of other social and demographic predictors on income.

In the model, gender difference is the most significant for personal income. Women immigrants are distinctively less paid than men. The next strongest determinants are education in Canada and education before entry. Higher level of schooling is likely to be related to higher income, especially when that education is

received in Canada. Age cohorts are also responsive to personal income. Middle age groups are more advantaged than both elderly and younger age groups. In addition, those who speak English or French most often at home tend to earn more. World regions of origin affect immigrant personal income, too. Those who were from Asia and Oceania, South America, and Africa are likely to be disadvantaged. The immigrants who were from Southern Europe and Eastern Europe tend to be better off in terms of income.

In short, gender, education, age, ethnicity and language are far more powerful than functional literacy in determining immigrant personal income.

Theoretical Implications of the Findings

The findings of this research have confirmed a number of the theories discussed in Chapter Two. First of all, immigrant functional literacy proves to be context-dependent at the personal level as well as at the social level. The literacy variables are highly responsive to most of the personal and contextual variables in the demographic model. The model can explain 60.1% of variance in reading ability, 49.8% of variance in numeracy ability, 44.1% of variance in reading achievement, and 40.6% of variance in numeracy achievement respectively. This supports the position that functional literacy in one of the Canadian official languages is

multi-causal, governed by various personal, social and contextual conditions, such as age, gender, parental education, education, years of immigration, cultural backgrounds, and occupation.

One important finding is that literacy competency in the first language has no significant effects on literacy abilities and numeracy achievement in the basic demographic model, but it has a significantly negative effect on reading achievement. This suggests that functional literacy in one of the official languages is independent of competency in the first language, and furthermore, those who cannot read or write in their first language are even advantaged in being functionally literate (in reading) in one of the official languages. The additional descriptive analysis using ANOVA shows that the mean score of reading achievement for those who are illiterate in their mother tongue is .605; while it is only .277 for those who assessed their competency in the first language to be excellent, compared to .354 for the target population.

This finding certainly questions Vygotsky's (1928) claim that learning a second language is dependent on the development of the first language. As well, it shakes the general belief that the correlation between mastery of the first language and acquisition of the second language is positive. This implies that the immigrants do not necessarily have to master their first language in order to become literate in the second language, English or French. That is to say, they can start learning the second language

directly. The most important thing is to provide them with a sound literacy education. This finding also indicates that the literacy ability in the first language is not necessarily as transferable as it has been believed to be.

However, cognitive functions and skills, the major characteristics of a literate gained through formal schooling, are transferable. This is inferred by the finding that education before entry has powerful effects on literacy abilities as well as achievement. Although the formal schooling received in their native land before entry may not necessarily provide immigrants with special training in one of the Canadian official languages, thinking skills and learning strategies trained by formal education are obviously helpful and important in immigrant's gaining functional literacy in one of the official languages later in Canada.

The above findings on the transferability of literacy ability in the first language and cognitive skills developed through formal education support, to some extent, Scribner and Cole's (1981) theory. That is why education before entry, instead of literacy competency in the first language, has the stronger positive effect on immigrant functional literacy in English or French.

Another interesting finding is that language spoken at home appears to have no influence on immigrant functional literacy. It

refutes Calamai's (1987) claim that English spoken in the home ... consistently produces higher literacy levels than French or all other languages. The result of this research suggests that no matter what language the immigrant speaks most often at home, it will not affect his or her functional literacy in one of the official languages. Having the right to choose to speak their native language at home gives immigrants positive feelings about their culture, their language, and themselves without the danger of jeopardising their functional literacy in English or French. This finding effectively supports the ideas underlying the policy of multiculturalism.

Finally, the results of this research have shown that Graff's (1979) claim based on his historical study of nineteenth century Canada is still valid in the case of non-official language speaking immigrants today. Functional literacy is not a powerful variable, when controlling for other social and demographic variables, in determining immigrant's income and presumably material well-being. It is still too feeble to overcome the prejudice of age, gender, ethnicity and education, concerning income inequality.

Practical Implications of the Findings

The findings of this research provide important practical implications in terms of Canada's immigration policy, immigrant literacy education and structural integration issues.

First of all, the findings suggest that age and education, (especially secondary and post-secondary education) should be given more credits in the point system of the immigration act, since age and education are extremely powerful predictors in immigrant functional literacy. Canada should attract more young people and well-educated people (secondary level of educational attainment and above). The results also imply that implementation of the point system has improved the quality of immigrants in terms of educational attainment and literacy abilities. This suggests that it would be more beneficial for Canada if more "third class" immigrants are accepted, including independent immigrants, entrepreneurs, self-employed and assisted relatives, who are to be selected by the point system.

Women immigrants are likely to have limited literacy skills to function effectively in daily activities in Canada and especially if they are unemployed. This suggests that women immigrants have greater need for the assistance of literacy education programs. More opportunities to participate in language and literacy training programs should be provided to women immigrants. And proper

arrangement about time of the programs offered and relieving women from home and children at the time the program being offered should be made so that women immigrants are able to attend those programs.

However, the findings of the low level of functional literacy in non-official language speaking immigrants casts doubt on the effectiveness of immigrant language and literacy programs. In addition, unlike the findings for the whole Canadian population, no difference in province of residence can be found in terms of immigrant functional literacy in the basic demographic model. This finding indicates that there is no significant difference among provinces in terms of the opportunities and quality of immigrant literacy education. Therefore, it can be inferred that in general, the immigrant language and literacy programs provided cannot satisfy the great needs of immigrants and their quality is not yet up to the requirement for functional literacy, even in the large metropolitan areas. More research and study are required to be conducted in this area in order to improve immigrant language and literacy education.

Though the result of a descriptive analysis shows that there is no significant difference between the income of the Canadian-born and that of non-official language speaking immigrants, it does not necessarily mean that immigrants have succeeded in economic integration. As noted previously, there are more immigrants without any income than the Canadian-born. It is obvious that more

immigrants are unemployed compared with the Canadian-born. Besides, immigrants are found to have higher average educational qualifications (Richmond & Kalback, 1980; Boyd, 1991) than do the Canadian-born, but many of them are not paid accordingly. Many of them are not working in their trained areas. Therefore, apparent earning no less average income than the Canadian-born does not embody successful structural integration for the non-official language speaking immigrants.

A close examination of the determinants of the personal incomes of immigrants reveals that the factors of age, gender, ethnicity and even education govern the variation of immigrant income. The results of the research show that education before entry has more powerful effects on immigrant literacy abilities and numeracy achievement than education in Canada. However, education in Canada accounts more for immigrant personal income. In reality, education in Canada is much more highly valued than is education before entry. In most cases, education before entry is credited only when further education in Canada is accomplished. That means education before entry does not count for much if the immigrant does not receive any further education in Canada.

The findings of the research suggest that education before entry has significantly positive effects on immigrant literacy abilities and numeracy achievement over-and-above education in Canada. Therefore, education before entry should be given due

credit and it deserves appropriate evaluation. Immigrants, with necessary literacy skills in one of the official languages, should be able to enjoy the equal opportunity to work in positions that their education has prepared them for without wasting their talent and training.

Possibilities for Further Studies

Two suggestions for further studies are made in this section. One is concerning about the modification of the demographic model for this study. The other is about further study of immigrant literacy education.

One of the motivations in conducting the present research was to find out the major determinants of immigrant literacy abilities and achievements in order to shed light on the effectiveness of Canada's immigration policy and immigrant literacy education. Therefore, demographic variables were selected for the research as independent variables. The demographic model, however, may be modified to further study the direct effects and indirect effects of the background variables via eduction variables, namely education before entry and education in Canada on literacy abilities and achievements. It may be more appropriate to regard education variables as intervening variables in the demographic model. The effects of the demographic variables on literacy may be

estimated more accurately.

The findings of the research strongly suggest that immigrant literacy education demands intensive and extensive studies in all aspects. The same database collected in the 1989 National Survey of Literacy Skills Used in Daily Activities can be used for the study of immigrant literacy education as well. The models, however, need to be rebuilt. Some insignificant predictors can be dropped off the models and others can be added to the models, for example, printing material exposure, main language spoken, job-related literacy requirements, self-perceived need of literacy programs. The purpose of the future study may be to find more effective ways to improve immigrant literacy abilities and achievements.

It is therefore hoped that this research, at this stage, may stimulate further studies on immigrant literacy and immigrant literacy education in Canada.

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APPENDIX A

Tables of Parameter Estimates

Table A1. Parameter Estimates for Basic Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

	Dependent Variable				
Independent variables	Immigrant Reading Ability B	SE (B)	t	Prob	Beta
AGE	-12.428	1.716	-7.244	.0000	-.274
GENDER	-9.860	3.294	-2.993	.0029	-.084
PDIMM	11.170	1.814	6.156	.0000	.246
PROV	.630	.915	.688	.4915	.019
BIRTH	-2.856	.870	-3.282	.0011	-.101
PEDUC	2.538	.654	3.879	.0001	.119
EDUCBE	6.986	1.255	5.565	.0000	.205
EDUCC	10.871	1.721	6.316	.0000	.182
LONE	-1.555	1.174	-1.325	.1857	-.044
ASLEF	13.321	1.476	9.024	.0000	.299
LANGH	5.802	3.911	1.484	.1384	.049
LANGOUT	32.011	5.105	6.271	.0000	.185
OCCUP	3.759	.716	5.253	.0000	.161
Constant	84.951	15.844	5.361	.0000	
Adj. R-Square	5453				

Table A2. Parameter Estimates for Basic Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

	Dependent Variable				
Independent variables	Immigrant Numeracy Ability B	SE (B)	t	Prob	Beta
AGE	-23.699	3.189	-7.431	.0000	-.312
GENDER	.700	6.124	.114	.9090	.004
PDIMM	19.799	3.373	5.870	.0000	.260
PROV	1.250	1.702	.735	.4629	.023
BIRTH	-5.262	1.618	-3.253	.0012	-.111
PEDUC	.472	1.217	.388	.6983	.013
EDUCBE	15.334	2.333	6.572	.0000	.268
EDUCC	9.411	3.199	2.942	.0034	.094
LONE	-.893	2.182	-.409	.6825	-.015
ASLEF	17.806	2.744	6.488	.0000	.238
LANGH	9.964	7.270	1.370	.1710	.051
LANGOUT	79.724	9.490	8.401	.0000	.275
OCCUP	4.264	1.330	3.205	.0014	.109
Constant	9.647	29.456	.328	.7434	
Adj. R-Square	.4407				

Table A3. Parameter Estimates for Basic Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

	Dependent Variable				
Independent variables	Immigrant Reading Achievement B	SE (B)	t	Prob	Beta
AGE	-.073	.016	-4.433	.0000	-.196
GENDER	-.095	.032	-3.005	.0028	-.099
PDIMM	.074	.017	4.277	.0000	.200
PROV	.002	.009	.285	.7759	.009
BIRTH	-.017	.008	-2.029	.0429	-.073
PEDUC	.023	.006	3.628	.0003	.130
EDUCBE	.046	.012	3.820	.0001	.164
EDUCC	.111	.146	6.768	.0000	.228
LONE	-.040	.011	-3.556	.0004	-.137
ASLEF	.068	.014	4.817	.0000	.186
LANGH	.011	.037	.288	.7735	.011
LANGOUT	.129	.049	2.637	.0086	.091
OCCUP	.032	.007	4.738	.0000	.170
Constant	-.545	.152	-3.597	.0003	
Adj. R-Square	.3784				

Table A4. Parameter Estimates for Basic Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

	Dependent Variable				
Independent variables	Immigrant Numeracy Achievement B	SE (B)	t	Prob	Beta
AGE	-.078	.018	-4.430	.0000	-.205
GENDER	-.100	.034	-2.948	.0033	-.101
PDIMM	.088	.019	4.713	.0000	.230
PROV	5.409	.009	.058	.9542	.002
BIRTH	.001	.009	.150	.8812	.006
PEDUC	.007	.007	1.044	.2967	.039
EDUCBE	.055	.013	4.234	.0000	.190
EDUCC	.108	.018	6.090	.0000	.214
LONE	-.001	.012	-.119	.9051	-.005
ASLEF	.061	.015	4.051	.0001	.164
LANGH	.140	.040	3.494	.0005	.142
LANGOUT	.091	.052	1.735	.0832	.063
OCCUP	.031	.007	4.204	.0000	.158
Constant	-.645	.163	-3.960	.0001	
Adj. R-Square	.3215				

Table A5. Parameter Estimates for Basic Model #2A, Socioeconomic Model of Immigrant Personal Income (Weighted N=624)

Dependent Variable					
Independent variables	Immigrant Personal Income B	SE (B)	t	Prob	Beta
AGE	.171	.072	2.371	.0181	.099
GENDER	-1.806	.139	-13.010	.0000	-.405
PDIMM	.159	.076	2.075	.0384	.092
PROV	-.144	.039	-3.737	.0002	-.115
BIRTH	-.018	.037	-.483	.6295	-.016
PEDUC	-.074	.028	-2.691	.0073	-.092
EDUCBE	.145	.053	2.735	.0064	.112
EDUCC	.536	.073	7.384	.0000	.236
LONE	.054	.049	1.084	.2790	.040
ASLEF	.110	.062	1.768	.0776	.065
LANGH	.807	.165	4.895	.0000	.181
LANGOUT	.130	.215	.603	.5467	.020
OCCUP	.229	.030	7.590	.0000	.258
Constant	1.727	.668	2.586	.0099	
Adj. R-Square	.4413				

Table A6. Parameter Estimates for Basic Model #2B, Socioeconomic Model of Immigrant Personal Income (Weighted N=624)

Dependent Variable					
Independent variables	Immigrant Personal Income B	SE (B)	t	Prob	Beta
AGE	.135	.076	1.775	.0764	.078
GENDER	-1.837	.141	-13.030	.0000	-.412
PDIMM	.192	.079	2.429	.0154	.111
PROV	-.142	.039	-3.690	.0002	-.113
BIRTH	-.026	.037	-.707	.4797	-.024
PEDUC	-.066	.028	-2.353	.0189	-.082
EDUCBE	.165	.055	3.018	.0027	.127
EDUCC	.569	.075	7.570	.0000	.251
LONE	.049	.050	.986	.3246	.036
ASLEF	.150	.066	2.268	.0237	.088
LANGH	.824	.165	4.994	.0000	.185
LANGOUT	.223	.227	.982	.3266	.034
OCCUP	.240	.031	7.795	.0000	.271
RDABIL	-.003	.002	-1.253	.2106	-.082
NUMABIL	8.688E-05	.001	.065	.9484	.004
Constant	1.991	.697	2.856	.0044	
Adj. R-Square	.4423				

Table A7. Parameter Estimates for Basic Model #2C, Socioeconomic Model of Immigrant Personal Income (Weighted N=624)

Dependent Variable					
Independent variables	Immigrant Personal Income B	SE (B)	t	Prob	Beta
AGE	.159	.074	2.165	.0308	.092
GENDER	-1.822	.140	-13.038	.0000	-.408
PDIMM	.169	.078	2.164	.0308	.098
PROV	-.143	.038	-3.720	.0002	-.114
BIRTH	.026	.037	-.708	.4789	-.024
PEDUC	-.065	.028	-2.354	.0189	-.081
EDUCBE	.151	.054	2.808	.0051	.116
EDUCC	.557	.075	7.383	.0000	.246
LONE	.035	.050	.703	.4822	.026
ASLEF	.125	.063	1.965	.0498	.073
LANGH	.772	.166	4.635	.0000	.173
LANGOUT	.165	.216	.762	.4462	.025
OCCUP	.235	.031	7.661	.0000	.266
RDACH	-.471	.210	-2.241	.0254	-.101
NUMACH	.285	.196	1.455	.1462	.063
Constant	1.653	.676	2.445	.0148	
Adj. R-Square	.4441				

Table A8. Parameter Estimates for Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Reading Ability B	SE (B)	t	Prob	Beta
AGE1	54.033	8.194	6.594	.0000	.274
AGE2	44.102	6.469	6.817	.0000	.291
AGE3	35.730	5.434	6.575	.0000	.267
AGE4	11.941	5.319	2.245	.0251	.083
GENDER	-7.247	3.611	-2.007	.0452	-.062
PDIMM1	-30.879	7.107	-4.345	.0000	-.232
PDIMM2	-16.574	6.485	-2.556	.0108	-.119
PDIMM3	-6.018	5.231	-1.150	.2504	-.040
PDIMM5	2.763	8.090	.341	.7329	.010
BIRTH1	-3.733	7.645	-.488	.6255	-.017
BIRTH2	33.724	5.741	5.874	.0000	.194
BIRTH3	17.911	6.410	2.794	.0054	.093
BIRTH4	24.495	8.984	2.727	.0066	.079
BIRTH6	14.115	8.885	1.589	.1127	.053
BIRTH7	-5.522	5.603	-.985	.3248	-.044
PEDUC	1.643	.700	2.348	.0192	.077
EDUCBE	6.271	1.169	5.364	.0000	.184
EDUCC	7.788	1.881	4.140	.0000	.130
ASLEF	13.743	1.482	9.273	.0000	.308
LANGH	-.120	3.925	-.031	.9756	-.001
LANGOUT	31.341	4.997	6.272	.0000	.181
OCC1	-24.601	6.573	-3.743	.0002	-.140
OCC2	-19.785	8.867	-2.231	.0260	-.074
OCC3	-20.938	7.164	-2.923	.0036	-.097
OCC4	-24.327	6.926	-3.512	.0005	-.134
OCC5	-25.756	8.337	-3.089	.0021	-.099
OCC6	-22.323	5.649	-3.952	.0001	-.160
OCC7	-13.683	7.392	-1.851	.0647	-.061
OCC9	11.348	6.270	1.810	.0708	.058
Constant	93.067	14.944	6.230	.0000	
Adj. R-Square	.5817				

Table A9. Parameter Estimates for Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

Independent variables	Dependent Variable Immigrant Numeracy Ability B	SE (B)	t	Prob	Beta
AGE1	101.998	15.404	6.622	.0000	.309
AGE2	79.362	12.162	6.525	.0000	.312
AGE3	68.057	10.216	6.662	.0000	.303
AGE4	27.771	10.000	2.777	.0057	.115
GENDER	6.731	6.789	.991	.3219	.034
PDIMM1	-49.832	13.361	-3.730	.0002	-.223
PDIMM2	-26.860	12.191	-2.203	.0280	-.115
PDIMM3	-10.189	9.834	-1.036	.3006	-.041
PDIMM5	27.275	15.209	1.793	.0734	.059
BIRTH1	-1.226	14.372	-.085	.9321	-.003
BIRTH2	51.058	10.793	4.731	.0000	.175
BIRTH3	23.302	12.050	1.934	.0536	.072
BIRTH4	46.541	16.889	2.756	.0060	.090
BIRTH6	8.602	16.704	.515	.6068	.019
BIRTH7	-11.710	10.534	-1.112	.2667	-.056
PEDUC	-.974	1.316	-.740	.4596	-.027
EDUCBE	14.716	2.198	6.695	.0000	.257
EDUCC	5.559	3.537	1.572	.1165	.056
ASLEF	17.146	2.786	6.154	.0000	.229
LANGH	-.214	7.378	-.029	.9769	-.001
LANGOUT	77.795	9.395	8.281	.0000	.269
OCC1	-28.860	12.357	-2.335	.0199	-.098
OCC2	-22.400	16.669	-1.344	.1795	-.050
OCC3	-8.780	13.468	-.652	.5147	-.024
OCC4	-37.000	13.021	-2.842	.0046	-.122
OCC5	-18.583	15.673	-1.186	.2362	-.043
OCC6	-34.314	10.619	-3.231	.0013	-.147
OCC7	-1.634	13.896	-.118	.9064	-.004
OCC9	19.263	11.786	1.634	.1027	.059
Constant	-9.928	28.094	-.353	.7239	
Adj. R-Square	.4738				

Table A10. Parameter Estimates for Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Reading Achievement B	SE (B)	t	Prob	Beta
AGE1	.349	.079	4.402	.0000	.217
AGE2	.176	.063	2.805	.0052	.142
AGE3	.171	.053	3.259	.0012	.156
AGE4	.045	.051	.879	.3798	.038
GENDER	-.080	.035	-2.294	.0221	-.084
PDIMM1	-.180	.069	-2.611	.0093	-.165
PDIMM2	-.029	.063	-.463	.6438	-.025
PDIMM3	-.058	.051	-1.154	.2489	-.048
PDIMM5	-.165	.078	-2.112	.0351	-.074
BIRTH1	-.093	.074	-1.257	.2092	-.051
BIRTH2	.246	.056	4.434	.0000	.174
BIRTH3	.196	.062	3.151	.0017	.125
BIRTH4	.139	.087	1.595	.1113	.055
BIRTH6	-.098	.086	-1.142	.2538	-.045
BIRTH7	-.055	.054	-1.016	.3099	-.054
PEDUC	.015	.007	2.210	.0275	.086
EDUCBE	.033	.011	2.902	.0038	.118
EDUCC	.098	.018	5.389	.0000	.201
ASLEF	.092	.014	6.402	.0000	.252
LANGH	-.009	.038	-.233	.8162	-.009
LANGOUT	.125	.048	2.579	.0101	.088
OCC1	-.192	.064	-3.016	.0027	-.134
OCC2	-.064	.086	-.741	.4591	-.029
OCC3	-.190	.069	-2.732	.0065	-.107
OCC4	-.251	.067	-3.750	.0002	-.170
OCC5	-.158	.081	-1.960	.0505	-.075
OCC6	-.103	.055	-1.885	.0599	-.090
OCC7	-.176	.072	-2.463	.0141	-.096
OCC9	.069	.061	1.129	.2593	.043
Constant	-.528	.145	-3.651	.0003	
Adj. R-Square	.4140				

Table A11. Parameter Estimates for Model #1, the Demographic Model of Immigrant Functional Literacy (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Numeracy Achievement B	SE (B)	t	Prob	Beta
AGE1	.253	.084	3.009	.0027	.153
AGE2	.199	.066	3.002	.0028	.156
AGE3	.186	.056	3.330	.0009	.165
AGE4	-.033	.055	-.611	.5411	-.028
GENDER	-.085	.037	-2.296	.0220	-.086
PDIMM1	-.165	.073	-2.258	.0243	-.147
PDIMM2	.021	.067	.317	.7513	.018
PDIMM3	-.042	.054	-.777	.4372	-.033
PDIMM5	-.032	.083	-.382	.7026	-.014
BIRTH1	-.257	.078	-3.277	.0011	-.138
BIRTH2	.189	.059	3.216	.0014	.130
BIRTH3	.087	.066	1.325	.1858	.054
BIRTH4	.005	.092	.054	.9569	.002
BIRTH6	-.114	.091	-1.246	.2131	-.051
BIRTH7	-.098	.058	-1.706	.0885	-.093
PEDUC	.001	.007	.186	.8524	.007
EDUCBE	.056	.012	4.670	.0000	.195
EDUCC	.088	.019	4.545	.0000	.175
ASLEF	.067	.015	4.400	.0000	.178
LANGH	.079	.040	1.951	.0516	.080
LANGOUT	.102	.051	1.989	.0471	.070
OCC1	-.202	.067	-2.990	.0029	-.137
OCC2	-.123	.091	-1.352	.1768	-.055
OCC3	-.133	.074	-1.805	.0717	-.073
OCC4	-.152	.071	-2.137	.0330	-.100
OCC5	-.214	.086	-2.505	.0125	-.098
OCC6	-.181	.058	-3.120	.0019	-.154
OCC7	.048	.076	.632	.5277	.025
OCC9	.079	.064	1.222	.2221	.048
Constant	-.322	.153	-2.098	.0364	
Adj. R-Square	.3772				

Table A12. Parameter Estimates for Model #2A, the Socioeconomic Model of Immigrant Financial Income (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Financial Income B	SE (B)	t	Prob	Beta
AGE1	-1.194	.342	-3.491	.0005	-.159
AGE2	-.037	.270	-.137	.8910	-.006
AGE3	.159	.227	.702	.4831	.031
AGE4	.468	.222	2.107	.0355	.086
GENDER	-1.585	.151	-10.511	.0000	-.355
PDIMM1	-.243	.297	-.818	.4137	-.048
PDIMM2	-.153	.271	-.564	.5728	-.029
PDIMM3	.066	.218	.302	.7627	.012
PDIMM5	.538	.338	1.593	.1117	.052
BIRTH1	-1.068	.319	-3.348	.0009	-.127
BIRTH2	-.832	.240	-3.469	.0006	-.126
BIRTH3	-.191	.268	-.713	.4760	-.026
BIRTH4	-1.106	.375	-2.948	.0033	-.094
BIRTH6	-1.023	.371	-2.757	.0060	-.101
BIRTH7	-1.000	.234	-4.275	.0000	-.210
PEDUC	-.004	.029	-.133	.8940	-.005
EDUCBE	.199	.049	4.084	.0001	.154
EDUCC	.524	.079	6.670	.0000	.231
ASLEF	.121	.062	1.957	.0508	.071
LANGH	.827	.164	5.046	.0000	.185
LANGOUT	.112	.209	.539	.5903	.017
OCC1	-1.691	.274	-6.161	.0000	-.254
OCC2	-.681	.370	-1.841	.0661	-.067
OCC3	-.254	.299	-.850	.3959	-.031
OCC4	.022	.289	.076	.9396	.003
OCC5	.308	.348	.884	.3770	.031
OCC6	-.365	.236	-1.550	.1217	-.069
OCC7	.190	.309	.615	.5391	.022
OCC9	.087	.262	.331	.7405	.012
Constant	3.237	.624	5.189	.0000	
Adj. R-Square	.4956				

Table A13. Parameter Estimates for Model #2B, the Socioeconomic Model of Immigrant Financial Income (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Financial Income B	SE (B)	t	Prob	Beta
AGE1	-1.047	.356	-2.936	.0034	-.140
AGE2	.080	.282	.285	.7760	.014
AGE3	.257	.236	1.089	.2768	.051
AGE4	.505	.223	2.260	.0242	.092
GENDER	-1.587	.153	-10.392	.0000	-.356
PDIMM1	-.320	.302	-1.061	.2892	-.063
PDIMM2	-.194	.272	-.714	.4757	-.037
PDIMM3	.051	.219	.231	.8173	.009
PDIMM5	.564	.339	1.664	.0967	.054
BIRTH1	-1.074	.319	-3.364	.0008	-.127
BIRTH2	-.750	.247	-3.041	.0025	-.114
BIRTH3	-.151	.269	-.560	.5758	-.021
BIRTH4	-1.039	.378	-2.749	.0062	-.088
BIRTH6	-.999	.372	-2.687	.0074	-.099
BIRTH7	-1.016	.234	-4.340	.0000	-.213
PEDUC	-.003	.030	-.096	.9235	-.004
EDUCBE	.219	.051	4.322	.0000	.169
EDUCC	.537	.080	6.726	.0000	.237
ASLEF	.151	.066	2.284	.0227	.089
LANGH	.826	.164	5.045	.0000	.185
LANGOUT	.214	.220	.970	.3325	.033
OCC1	-1.743	.278	-6.278	.0000	-.262
OCC2	-.723	.372	-1.945	.0523	-.071
OCC3	-.285	.302	-.944	.3455	-.035
OCC4	-.037	.292	-.127	.8993	-.005
OCC5	.263	.351	.748	.4549	.027
OCC6	-.420	.239	-1.757	.0794	-.079
OCC7	.173	.310	.557	.5779	.020
OCC9	.116	.262	.442	.6589	.016
RDABIL	-.001	.002	-.467	.6405	-.030
NUMABIL	-8.440E-04	.001	-.651	.5152	-.037
Constant	3.335	.667	5.000	.0000	
Adj. R-Square	.4957				

Table A14. Parameter Estimates for Model #2C, the Socioeconomic Model of Immigrant Financial Income (Weighted N=624)

Independent variables	Dependent Variable: Immigrant Financial Income B	SE (B)	t	Prob	Beta
AGE1	-1.164	.348	-3.347	.0009	-.155
AGE2	-.037	.273	-.136	.8922	-.006
AGE3	.161	.230	.701	.4834	.032
AGE4	.485	.223	2.181	.0296	.089
GENDER	-1.586	.152	-10.455	.0000	-.355
PDIMM1	-.251	.299	-.839	.4016	-.050
PDIMM2	-.164	.271	-.605	.5454	-.031
PDIMM3	.061	.219	.278	.7808	.011
PDIMM5	.506	.339	1.490	.1367	.049
BIRTH1	-1.037	.322	-3.219	.0014	-.123
BIRTH2	-.813	.244	-3.332	.0009	-.123
BIRTH3	-.163	.270	-.604	.5463	-.022
BIRTH4	-1.074	.376	-2.855	.0045	-.091
BIRTH6	-1.022	.372	-2.751	.0061	-.101
BIRTH7	-.993	.235	-4.231	.0000	-.208
PEDUC	-.001	.029	-.022	.9821	-.001
EDUCBE	.195	.050	3.930	.0001	.151
EDUCC	.529	.081	6.549	.0000	.233
ASLEF	.129	.064	2.010	.0448	.076
LANGH	.809	.165	4.909	.0000	.181
LANGOUT	.121	.210	.574	.5660	.018
OCC1	-1.694	.277	-6.110	.0000	-.254
OCC2	-.671	.371	-1.809	.0709	-.066
OCC3	-.271	.301	-.900	.3682	-.033
OCC4	-.006	.293	-.019	.9845	-.001
OCC5	.315	.350	.899	.3689	.032
OCC6	-.352	.238	-1.481	.1390	-.066
OCC7	.138	.312	.444	.6570	.016
OCC9	.087	.262	.330	.7414	.011
RDACH	-.235	.206	-1.138	.2556	-.050
NUMACH	.206	.194	1.062	.2886	.046
Constant	3.180	.631	5.039	.0000	
Adj. R-Square	.4952				

APPENDIX B

Key to Variable Labels

Key to the Variable Labels for the Basic Models

PDIMM	'period of immigration'
PROV	'province of residence'
BIRTH	'world regions of origin'
PEDUC	'parental education'
EDUCBE	'education before entry'
EDUCC	'education in Canada'
LONE	'literacy competency in the first language'
ASLEF	'age when starting learning English or French'
LANGH	'language spoken at home'
LANGOUT	'language spoken outside home'
OCCUP	'occupation'
RDABIL	'reading ability'
NUMABIL	'numeracy ability'
RDACH	'reading achievement'
NUMACH	'numeracy achievement'

Key to the Variable Labels for the Developed Models

AGE1	'16-24 years old'
AGE2	'25-34 years old'
AGE3	'35-44 years old'
AGE4	'45-54 years old'
AGE5	'55-69 years old'
PDIMM1	'immigrated to Canada during 1989-1980'
PDIMM2	'immigrated to Canada during 1970-1979'
PDIMM3	'immigrated to Canada during 1960-1969'
PDIMM4	'immigrated to Canada during 1950-1959'
PDIMM5	'immigrated to Canada prior to 1950'
BIRTH1	'born in the south America'
BIRTH2	'born in the western Europe'
BIRTH3	'born in the eastern Europe'
BIRTH4	'born in the northern Europe'
BIRTH5	'born in the southern Europe'
BIRTH6	'born in Africa'
BIRTH7	'born in Asia and Oceania'
PEDUC	'parental education'
EDUCBE	'education before entry'
EDUCC	'education in Canada'
ASLEF	'age when starting learning English or French'
LANGH	'language spoken at home'
LANGOUT	'language spoken outside home'

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OCC1     'not employed'
OCC2     'transportation and equipment'
OCC3     'construction'
OCC4     'skilled manual occupations'
OCC5     'primary occupations'
OCC6     'services'
OCC7     'clerical occupations'
OCC8     'professional occupations'
OCC9     'management'
RDABIL   'reading ability'
NUMABIL  'numeracy ability'
RDACH    'reading achievement'
NUMACH   'numeracy achievement'
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APPENDIX C

Key to World Regions of Origin

World Regions of Origin

'South America' includes all the countries in South America plus those in Central America and Caribbean and Bermuda.

'Western Europe' includes:
Austria
Belgium
France
Liechtenstein
Luxembourg
Monaco
Netherlands
Switzerland
West Germany (old)

'Eastern Europe' includes:
Bulgaria
Czechoslovakia (old)
East Germany (old)
Hungary
Poland
Rumania
USSR (old)

'Northern Europe' includes:
The Republic of Ireland
United Kingdom
Denmark
Finland
Iceland
Norway
Sweden

'Souther Europe' includes:
Albania
Andorra
Cyprus
Gibraltar
Greece
Italy
Malta
Portugal
San Marino
Spain
Vatican City State
Yugoslavia

'Africa' includes all countries in Africa.

'Asia & Oceania' include all Asian and Oceanian countries.