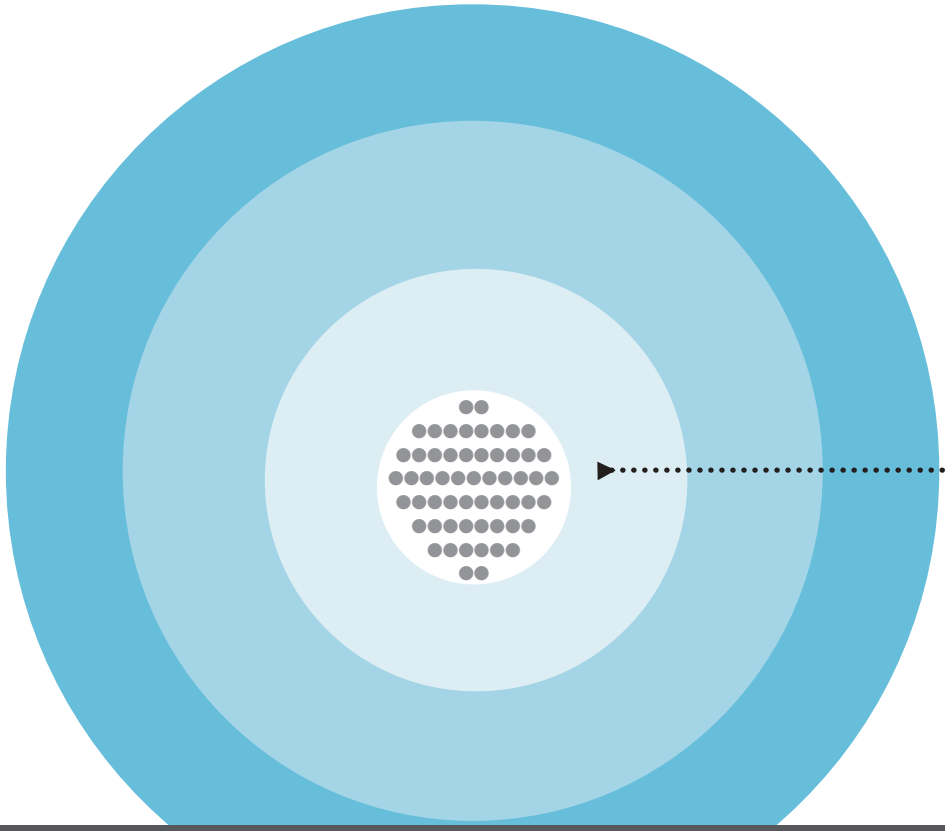
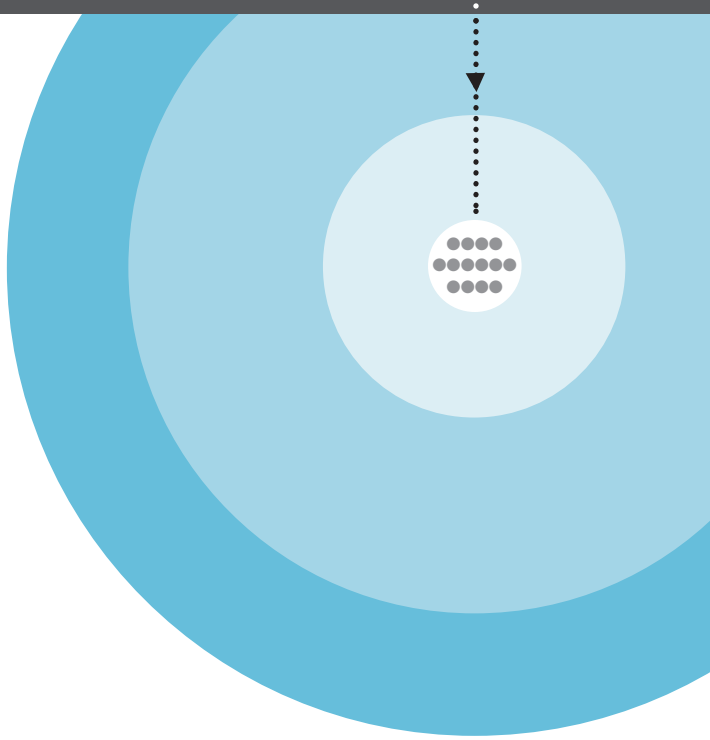


MOVING THE MARKERS

New Perspectives on Adult Literacy Rates in Canada

SUSAN B. SUSSMAN

August 2003




Movement for Canadian Literacy

Administrative support for this research project was provided by the Movement for Canadian Literacy (MCL). The report does not necessarily represent the views of MCL's Board of Directors and Learners Advisory Network, but is published in the interests of building awareness and stimulating dialogue on current literacy issues in Canada.
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The Movement for Canadian Literacy (MCL) is a national non-profit organization representing literacy coalitions, organizations and individuals from every province and territory. For over 25 years, MCL has worked to:

- inform the federal government and the public about issues related to adult literacy in Canada;
- provide a national forum for provincial and territorial literacy organizations to work together to ensure that all Canadians have access to quality literacy education;
- strengthen the adult learner voice; and
- support the development of a strong movement of people and organizations supporting adult literacy in Canada.

Executive Summary

This report describes a project originally intended to identify demographic patterns among adults with low literacy skills in each Canadian province. The project was carried out between March 2000 and June 2001 under the auspices of Movement for Canadian Literacy (MCL). Project funding came from the National Literacy Secretariat of Human Resources Development Canada.

The project was based on the assumption that demographic information about people with the lowest literacy skill levels can and should be used to develop more effective and efficient literacy policies and programs.

The report is organized in eight chapters and one appendix.

Objectives

Chapter 1, Introduction, tells how the report it organized, describes factors that lead to the decision to do this project, and lists the project's four main objectives:

1. Review the best available statistical data on low literacy to identify demographic patterns in low literacy amongst adults in all provinces and territories across Canada.

2. Describe and discuss the technical and conceptual issues associated with all methods of estimating population literacy rates.

3. Encourage and assist literacy stakeholders in each province and territory to identify possible implications of demographic patterns in literacy rate statistics for policies and programs in their own regions.

4. Encourage and assist more literacy stakeholders to discuss and debate literacy rates, who uses them, the assumptions and claims that are based upon them, and when and how they are used.

Chapter 2, Literacy Rate Statistics and Public Policy Development, looks briefly at when, how and why literacy advocates and decision-makers use literacy rate statistics to influence Canadian adult literacy policies and programs. Advocates use literacy rate data to develop public awareness of literacy as an important public concern and to

promote political commitment to the issue. Decision makers use literacy rate data in each stage of the policy development process, including in the evaluation of policy outcomes.

Chapter 3, Methods of Estimating Population Literacy Rates, describes and discusses the technical and conceptual issues associated with all methods of estimating literacy rates. One major issue has to do with how literacy is defined. Literacy experts don't agree about how to define literacy, and there are many possible interpretations of the word. Definitions of literacy differ depending on whether literacy is conceived of as narrow or broad, absolute or relative, fixed or dynamic, singular or multiple, autonomous or contextually specific. Ideas about the definition of literacy are implied or clearly expressed in all measurement approaches. People who disagree on the definition of literacy are unlikely to agree on how to measure it. Some experts say that defining literacy is a prerequisite for measuring it.

Four methods of developing literacy rate estimates are discussed in detail, and the strengths and limitations of each approach are identified. The four methods are: self-assessments, proxy or surrogate measures, direct assessments, and synthetic estimates based on existing data. Their respective strengths and limitations are summarized on page 21.

Chapter 4, Overview of Data Analysis Methodology, provides a brief summary of the key elements of the International Adult Literacy Survey (IALS), an overview of the methods used in this project to develop new demographic profiles of low literacy using IALS literacy rate data, and a discussion of the limitations of this project. IALS measures more than the ability to decode (i.e. recognize letters, associate them with the sounds they represent, and combine them into words, sentences and texts). By asking increasingly complex questions about various text samples, IALS also measures higher-level information processing skills that are involved in using print for various purposes. These include the ability to analyze, organize, compare and interpret elements of a text, often drawing on one's previous knowledge. This chapter explains methodological considerations associated with developing synthetic

provincial literacy estimates based on IALS data and why it was not possible to develop comparable estimates for Canada's three territories.

Chapter 5, Cross-tabulations, describes the first step of the statistical analysis: cross-tabulations of national data using specific variables. Information in this chapter is presented in text, tables and charts. This chapter shows national profiles of literacy level groups by age, education, and language use. Particular attention is paid in these analyses to the demographic differences found between adults at the two lowest levels (i.e. Levels 1 and 2) as measured by IALS. The analysis shows that at the national level Canadian adults at the two lowest literacy levels generally fit the following demographic profiles.

The Level 1 group is comprised of…

- significantly more older adults than all other levels. Over half of Level 1, 54%, is age 56 or over. This figure represents 2.4 million adult Canadians.

- people with much less formal education than those at other levels. 80% of Level 1 (roughly 3.6 million adult Canadians) is comprised of adults without a secondary diploma, 55% without any schooling after the primary level.

- in absolute numbers, an almost even mix of Anglophones, Francophones and Allophones.

- a much higher proportion of Allophones than all other levels. One-third of all adults in Level 1 do not have English or French as their first language. That's roughly 1.4 million people.

The Level 2 group is comprised of…

- a mix of people demographically similar to the Canadian adult population at large.

- people at various ages, roughly in the same proportion as their numbers in the population at large. Just under one quarter, 24%, are age 56 or older. That's nearly 1.3 million people. More than two in five, 42%, of the Level 2 group are between the ages of 16 and 35.

- Anglophones, Francophones and Allophones in proportions roughly similar to their numbers in the population at large. English-only speakers comprise 50% of the Level 2 group. Those with French as their first language comprise 27%–29% of the Level 2 group. 18% of the Level 2 group, about 962,000 people, has some other non-official first language.

Chapter 6, Probit Regression Analyses of Canadian IALS Data, describes the second step of the statistical analysis: probit regression analyses. A national predictor model, used to develop literacy estimates and demographic profiles for ten provinces, was based on the regression analysis. Detailed information about this step is contained in Appendix 1.

Chapter 7, Provincial Estimates of Prose Literacy Demographics: Methodology and Findings, describes the third and final step of the statistical analysis: the development of estimated demographic profiles of literacy for ten provinces. Demographic estimates for groups at each literacy level (IALS), in each province, are presented in cross-tabulation tables.

Chapter 8, Implications, Speculations and Recommendations, the final chapter in this report, reviews the key findings of this project, looks at the implications for literacy policies and programs, and makes recommendations for future action. Four key findings are discussed:

- Literacy rate statistics are used to influence the development of literacy policies and programs.

- All existing methods used to develop literacy rate statistics have significant technical and conceptual limitations.

- Demographic patterns found in literacy rate statistics provide information about target groups that is highly relevant for literacy-related interventions.

- Self-assessments of literacy skills by IALS participants provide

important information about the challenges of improving literacy rates in Canada.

In addition to these four key findings, three areas calling for further study are identified and discussed: the possible effects of people with special learning challenges on literacy rate statistics; the possible link between the literacy demands associated with using the Internet and the needs and motivations of people with Level 2 literacy skills; and the importance of each nation's demographic patterns and the possible relevance of these demographic differences to international comparisons of aggregated literacy rates.

Twenty-five recommendations are made based on the review of findings and related implications. These are:

1. Given the potential influence of literacy rate data on the development of policies and programs, alternative plausible interpretations of literacy rate data should be identified and considered before that data is used to inform policy decisions.

2. Researchers from various professional affiliations and theoretical persuasions should be involved in interpreting literacy rate data as early as possible in data analysis and policy development processes.

3. Consumers of research should be encouraged to take more time to, and be supported to reflect critically on literacy rate data and related interpretations.

4. Training for advocates, policy-makers and other interested parties in how to critically review literacy rate research should be included in initiatives to build Canada's literacy-related research capacity.

5. The costs and benefits of various approaches to developing literacy rate data, for various purposes, should be systematically assessed and compared. This analysis should inform future decisions about investments in literacy rate studies. The federal government should take the lead on this, in concert with literacy stakeholders across Canada.

6. The distinctions between Level 1 and Level 2 groups should be described in all presentations and policy discussions about Canada's literacy challenges.

7. The demographic differences between the Level 1 and Level 2 groups should be reflected and accommodated for in literacy program outreach strategies, goals, content and schedules.

8. The impacts of low literacy on the well being of older adults should be systematically assessed.

9. All provincial and federal departments that provide services and programs for seniors should recognize low literacy among seniors as a priority concern.

10. Literacy upgrading for low-literate older workers should be linked to other kinds of services and supports designed to help older workers find and/or keep new jobs.

11. The comparative effectiveness of different strategies for helping seniors overcome problems associated with low literacy should be evaluated.

12. Improving access to literacy upgrading for older Canadians should be a priority.

13. Access to information is important to all Canadians. New strategies to make important information more accessible for people with low literacy skills should be developed and implemented.

14. The distinct literacy issues of Francophones should be a policy priority. In addition to strategies designed to help low-literate Francophones improve their skills, strategies to increase the proportion of Francophones at the highest literacy level should be developed and implemented.

15. An appropriate mix of literacy development and support services to meet the needs of different groups within the Allophone category should be provided.

16. Jurisdictional barriers between English or French as a Second Language (ESL and FSL) programs and literacy programs should be resolved with the goal of providing all Allophones in Canada with more timely access to more appropriate and effective language and literacy development services.

17. Allophone immigrants to Canada should be guaranteed access to adequate levels of language and literacy development and encouraged and supported to become sufficiently literate in English or French so that they can achieve their own goals and contribute to Canada to the full extent of their abilities. Access to these programs should extend beyond the period in which an Allophone is a newcomer to Canada.

18. The full range of effects of immigration on Canada's literacy rates and the composition of groups at each literacy level should be identified in future analyses of literacy rate statistics. Canada's immigration plans and trends should be taken into account when decision-makers plan future literacy initiatives.

19. Basic skills upgrading and secondary school equivalency programs should be accessible to all adults in Canada who need them. In particular these programs should be targeted primarily towards:

- people in the Level 1 group;
- people who have not completed secondary school;
- Allophones and Francophones within the Level 1 group; and people in Level 2 who graduated from secondary schools outside of Canada.

20. To reduce rates of low levels of adult literacy in the future:

- elementary and secondary school students should be encouraged and supported to stay in school for as long as possible.
- extra supports should be provided to help students with English or French as a second language succeed and stay in school.

21. Comparisons of literacy rates between nations should include information about the demographic compositions of those nations and of specific literacy level groups.

22. The issue of where to set the bar for "good enough" literacy skills requires further consideration. Standard setting should be informed by the best available empirical evidence as well as by anecdotal evidence provided by adults with literacy difficulties.

23. Research should be undertaken to identify the prevalence and distribution of people with special learning challenges in general literacy rate statistics.

24. Federal, provincial and local literacy decision-makers should act quickly on specific recommendations contained in *Literacy and Disabilities* (Macht, 2000) including:

- making all mainstream literacy programs accessible to people with all types of disabilities.
- making time lines and student expectations in literacy programs more flexible to allow for the inclusion of people with disabilities.
- increasing the use of computers in adult literacy programs and access to technical aids and assistive devices.
- providing support (attendants or scribes) when necessary to enable a disabled person to participate in a literacy program.
- screening all adults in literacy programs for learning difficulties, including learning disabilities and hearing or visual disabilities.
- ensuring that people who work or volunteer in literacy programs are fully aware of and trained to deal with issues presented by students with disabilities.
- supporting and encouraging disability organizations to recruit and train their own literacy instructors and volunteers.

25. Research on the literacy demands associated with the use of the Internet should be carried out. Findings from this research should inform the development of new strategies to improve literacy levels among Canadians in the Level 2 group.

Appendix 1 contains details of the probit analysis carried out in the second step of this project. Additional national and provincial data tables produced as part of this project will be made available upon request.

Acknowledgements

Contributions and support from many different people and organizations made this project possible. The National Literacy Secretariat (NLS) of Human Resources Development Canada generously provided project funding. In particular, two people at NLS, **Christiane Dodge** (former Director of the NLS) and **Lynne Lalonde** (Manager, Community Literacy Partnerships) were most generous with their wise counsel and unflagging encouragement.

The Boards of Directors of two literacy organizations gave me the space to carry out this project. The Board of the Ontario Literacy Coalition granted me a leave of absence from my job so I could focus exclusively on this work. The Board of Movement for Canadian Literacy (MCL) served as the project's organizational sponsor and lent me that organization's expertise and resources. MCL's executive director, **Wendy DesBrisay**, helped greatly, in countless ways.

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Maryanne Bourgeois, *New Brunswick Literacy, Inc.*
Wendy DesBrisay, *Movement for Canadian Literacy*
Scott Dickson, *Prismalight Communications*
Dr. David Foot, *Department of Economics, University of Toronto*
Linda Mitchell, *Literacy BC*
Jean Pignal, *Statistics Canada*
Marg Rose, *Literacy Partners of Manitoba*
Cate Sills, *NWT Literacy Coalition*

Dr. **Michael Ornstein**, from the Institute for Social Research (ISR) at York University, designed and carried out the statistical analyses that are the foundation of this project. **Paul Moore**, also from ISR and a graduate student at York, helped me find ways to explain the statistical findings to non-statisticians. Both of them taught me things I needed to know about statistics and working with statisticians.

Early in my career Dr. **David Foot** taught me to think about the impacts of demographic trends on social, economic and political

issues. I am most grateful that he agreed to participate on this project's advisory committee and generously gave of his time, advice and encouragement whenever I asked.

Alpha Plus Centre's excellent resource collection included most of the information I needed for a review of literature on literacy rate assessments. I'm especially grateful to **Maria Moriarty**, Alpha Plus librarian extraordinaire, for facilitating generous access to Alpha's materials over the duration of this project.

Daniel Shapiro's proofreading and **Anne Wright**'s desktop publishing skills made this report look as good as possible.

Last but not least, my friends and family were loving and supportive when I needed them. A special thank you is owed to **Maridene Johnston** for her special wisdom and encouragement.

Preface

This report looks at the use of Canadian adult literacy rate statistics in the development of adult literacy policies and programs. Are you tempted to stop reading this now? Many people are wary of statistics, believing that numbers can and will be manipulated to prove whatever a researcher wants them to show. Few Canadians, including those involved in adult literacy work, have ever formally studied the sciences of statistics or research design. Thus few can confidently examine statistical research findings and interpret them independently.

Many people are wary of statistics, believing that numbers can and will be manipulated to prove whatever a researcher wants them to show.

People working in the literacy field who do have a research background rarely have the time or mandate to critically consider new research. Meanwhile they have learned plenty through their own first-hand experiences and the stories others tell them. As far as many people are concerned, statistics are alien and alienating.

On the other hand, policy makers are rarely persuaded by anecdotal evidence alone that a particular problem demands a public policy response. And anecdotes are usually not enough to convince our own colleagues that one way of doing things is more effective than another. While personal experience and anecdotal evidence is extremely important, they are an insufficient foundation upon which to build sound, defensible public policy.

That's where research and statistics come in. Statistics help us organize, summarize, analyze and understand our data. They can help us attain our goals. Stop and listen to the evening news, or scan the daily newspaper. Nearly every social, political and economic argument will be backed up by statistical research. Whether one is wary of statistics or not, numbers generated through systematic research are used every day to shape our understanding of the world we live in and to influence the development of public policy.

Whether one is wary of statistics or not, numbers generated through systematic research are used every day to shape our understanding of the world we live in and to influence the development of public policy.

Where literacy policy decisions are being made, literacy rate statistics are being used. They are interpreted as an indicator of how literacy skills are currently distributed amongst Canadians. Past literacy rate statistics are compared with current rates, which in turn

We need to know what questions to ask about the research, and the will and ability to be critical consumers of literacy rate statistics.

will be compared to future studies to see whether and how much progress has been made towards "moving the literacy markers".

Those of us who want to influence Canada's literacy policies and programs don't necessarily need to become statisticians. We do, however, need to know what questions to ask about the research, and the will and ability to be critical consumers of literacy rate statistics.

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Introduction

The Government of Canada's Speech from the Throne (Clarkson 2001) notes that "...many Canadian adults lack the higher literacy skills needed in the new economy...". In light of this problem, the federal government announced its commitment to "…invite the provinces and territories, along with the private sector and voluntary organizations to launch a national initiative with the goal of significantly increasing the proportion of adults with these higher-level skills."

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Many individuals and organizations in Canada are trying to increase the proportion of adults with higher-level literacy skills — that is, trying to "move the literacy markers". They need to know not only *how many* Canadians have literacy difficulties; they also need to know *which* Canadians they are. Efforts to raise literacy levels need to be relevant to and appropriate for potential target groups.

They need to know not only *how many* Canadians have literacy difficulties; they also need to know *which* Canadians they are.

The project described in this report was originally intended to provide decision makers with new information about potential target groups for literacy policies and programs. Specifically, this project's primary objective was to use existing literacy rate data to identify demographic patterns amongst Canadian adults with low literacy skills. Additional objectives included an examination of how and when literacy rate statistics influence the development of literacy policies and programs, and a review of the strengths and weaknesses of all existing approaches to estimating adult literacy rates.

1.1 THE ORGANIZATION OF THIS REPORT

This report is organized as follows:

- Chapter 1 introduces the project and this report.
- Chapter 2 looks at when, how and why literacy rate statistics influence Canadian adult literacy policies and programs.
- Chapter 3 describes and discusses the technical and conceptual issues associated with all methods of estimating population literacy rates. Competing ideas about the nature and definition of literacy are

discussed in Section 3.1. Four approaches used to determine population literacy rates are summarized and the strengths and weaknesses of each approach are identified in Section 3.2.

- Chapter 4 provides a brief summary of the key elements of the International Adult Literacy Survey (IALS), and an overview of the methods used in this project to develop new demographic profiles of low literacy using IALS literacy rate data. Section 4.2 looks at methodological considerations associated with the decision to base this analysis on IALS. Section 4.3 describes limitations of the present project.

- Chapter 5 describes in detail the first step of our statistical analysis: cross-tabulations of specific variables. Information in this chapter is presented in text, tables and charts.

- Chapter 6 describes in detail the second step of the statistical analysis: probit regression analyses.

- Chapter 7 describes the third and final step of the statistical analysis: the development of estimated demographic profiles of literacy for ten provinces. Information for each province is presented in tables and charts.

- Chapter 8 examines the implications of the findings of this project for literacy policies and programs. Key findings from our statistical analyses are summarized in tables in Section 8.1 and recommendations are given related to each finding. Particular attention is paid to the demographic similarities and differences found between adults at the two lowest levels (i.e. Levels 1 and 2) as measured by IALS.

In addition, three areas calling for further study are identified and discussed.

Appendix 1 contains detailed information about probit regression analyses. Supplementary provincial data tables, produced as part of this project, will be made available upon request.

1.2 PROJECT OVERVIEW

This project was carried out between March 2000 and June 2001 under the auspices of Movement for Canadian Literacy (MCL). The National Literacy Secretariat of Human Resources Development Canada funded the study. Most of this report was completed by July 2001, but personal problems delayed its completion until June 2003.

Numerous senior researchers question the usefulness and/or validity of all existing literacy rate studies.

At the outset of this project I reviewed the literature related to measuring literacy rates across large populations. I needed to identify the best possible data set(s) for this project's purposes. I was surprised to find that numerous senior researchers question the usefulness and/or validity of all existing literacy rate studies. Many argue persuasively that there are major technical and theoretical limitations associated with all existing literacy rate studies. Some have gone so far as to say that we should rethink basic claims we make about the dimensions and impacts of adult literacy problems. (For example, see Heap, 1990; Mikulecky, 1990; Olson, 1990; Sticht, 2001; Venezky, 1992, 1994, and 1996; Wagner, 1994.)

Some have gone so far as to say that we should rethink basic claims we make about the dimensions and impacts of adult literacy problems.

Informally I tried to determine whether and/or what other Canadian literacy advocates and policy-makers know about the debate among experts over literacy rate statistics, and whether they are concerned about the implications of that debate. I found that literacy rate data has most often been accepted as presented and interpreted by statisticians, and then used to inform advocacy efforts and policy and program decisions. As far as I could tell, there had been relatively little informed discussion or debate in this country among literacy stakeholders about assessment methods, the interpretations of literacy rate surveys and/or the appropriate use of literacy rate data.

Thus I faced a dilemma early in the life of this project. I became less certain about the validity and reliability of available literacy rate data, and consequently I was also less sure of how useful it would be to develop demographic profiles of Canadians at varying literacy levels based on a secondary analysis of existing data.

I considered throwing the baby out with the bath water—that is, pulling the plug on my research plans because of these new concerns. I knew, however, that whether or not I went ahead with this project,

literacy rate data would continue to influence literacy policies and programs across Canada. For better or worse, questions like, "how many people have this problem", "which people have this problem", and "what are the impacts of this problem" are inevitably asked and answered in the process of public policy development.

For better or worse, questions like, "how many people have this problem", "which people have this problem", and "what are the impacts of this problem" are inevitably asked and answered in the process of public policy development.

1.2.1 Project objectives

In light of the above, the objectives of this project were stated as follows:

1. Review the best available statistical data on low literacy to identify demographic patterns in low literacy amongst adults in all provinces and territories across Canada.

2. Describe and discuss the technical and conceptual issues associated with all methods of estimating population literacy rates.

3. Encourage and assist literacy stakeholders in each province and territory to identify possible implications of demographic patterns in literacy rate statistics for policies and programs in their own regions.

4. Encourage and assist more literacy stakeholders to discuss and debate literacy rates, the assumptions and claims that are based upon them, how they are used and who uses them.

When it comes to the goal of moving the markers in literacy I believe the last objective in the list is the most important.

1.3 BACKGROUND TO THE CURRENT PROJECT

The roots of this project lie in earlier efforts to develop a social marketing strategy for literacy in Ontario. In 1998, local literacy programs in Ontario were looking for new marketing tools to encourage more adults to sign up for literacy programs. The Ontario Literacy Coalition (OLC) contracted with federal and provincial departments to develop a province-wide social marketing plan for literacy. I was responsible for managing that initiative.

A top-notch marketing firm was hired to help us—the same company that developed the highly successful "Participaction"

campaign in the early 1980's. The first thing the consultants wanted to know was "which market segments" we wanted to reach with our new marketing plan. Given that our goal was to attract more students, they suggested we could get the best "bang for the buck" by using our limited resources to reach the largest possible group of people at the lowest literacy level. Thus they asked:

Knowing as much as possible about the characteristics and motivations of people at the two lowest literacy levels should help us do a better job of reaching them and meeting their needs. Specifically, this information can be used to develop more effective and efficient learner recruitment strategies, and more relevant program goals, schedules and content.

- How old are the majority of adults with low literacy skills?
- Are they currently employed?
- What language do they speak?
- How much education have they had?
- Where do they live?

This information was not readily available. Reports from the International Adult Literacy Survey, the best available source of recent Canadian literacy rate data, emphasize that low literacy is found in all groups across the population. They tell us that over 4.5 million adult Canadians (age 16 years and over) have extremely seriously inadequate literacy skills, and that an additional 5.5 million also can't handle common literacy demands in a knowledge-based economy.

It was easy to find data on the distribution of literacy levels within specific demographic groups (e.g. the percentage of 16-25 year olds at the lowest literacy level; the percentage of Francophones at the highest literacy level). But what we needed was information on the composition and actual numbers of people in the lowest literacy level groups, broken down by demographic factors (e.g. composition of the lowest literacy group by age, gender, language, etc.).

In theory at least, knowing as much as possible about the characteristics and motivations of people at the two lowest literacy levels should help us do a better job of reaching them and meeting their needs. Specifically, this information can be used to develop more effective and efficient learner recruitment strategies, and more relevant program goals, schedules and content.

The problem can be visualized in terms of concentric circles (see Figure 1A and 1B). Assume that it is possible to gather in one place,

all the adults in Canada with extremely low literacy skills (i.e. estimated to be 4.5 million adults or 22% of the total adult population at Level 1). Imagine that all those adults are standing inside a large circle. Now gather all the Canadian adults with marginally better skills than the lowest skill group (i.e. 26% of the adult population at Level 2) and have them stand in a ring around the Level 1 circle. Do the same thing with adults at the next highest literacy level (i.e. 34% at level 3). Let them form a ring around the Level 2 group. Finally, let all Canadian adults at the highest literacy level form the outermost ring (i.e. 18% at Level 4/5). The resulting image of concentric circles (Figure 1A) resembles a target, with people at the lowest skill levels located in the target's bull's-eye. The size of the Level 1 group is reflected in the size of the inner circle.

Strategies that effectively target most people in the lowest level group will lower the number of people in the innermost circle, improve overall literacy rate, and change the dimensions of the concentric circles.

The goal of Canada's literacy efforts is to reduce the number and proportions of Canadians at the lowest literacy levels and increase the proportions with higher-level skills (i.e. "moving the markers"). Strategies that effectively target people in the lowest level groups will lower the number of people in the innermost circle, improve overall literacy rates, and change the dimensions of the concentric circles. When efforts to raise literacy levels succeed, the rings closest to the target's centre will get smaller, while the outer rings will be enlarged (as in Figure 1B).

Figure 1A. The Current Literacy Target (based on IALS, 1994)

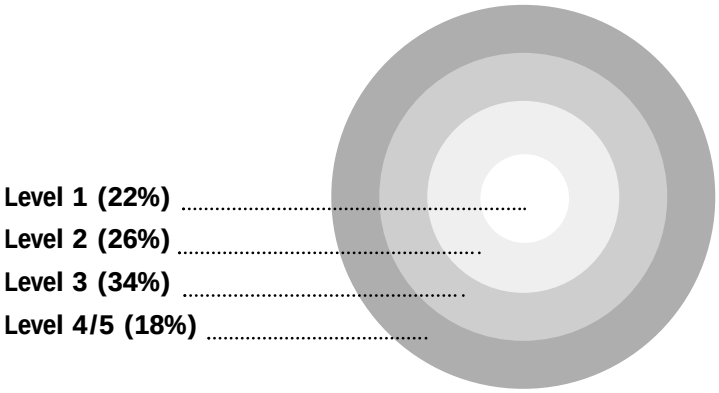
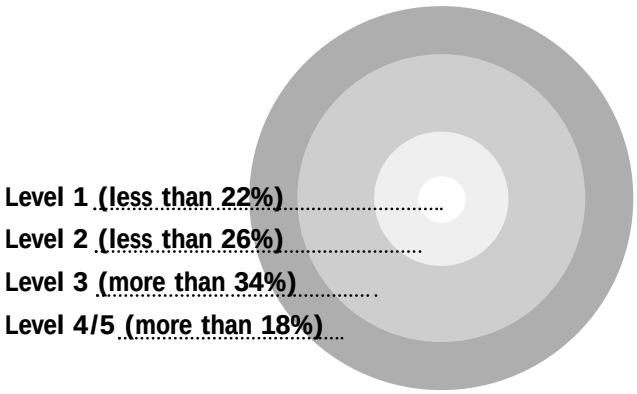


Figure 1B. Target When Literacy Rates are Improved at Some Point in the Future



Prior to this analysis I had uncritically accepted the view that low literacy was a significant problem for large numbers of Canadians in every demographic group. The new analysis suggested, however, that the majority of Canadian adults with the very lowest literacy skills clearly belonged to two distinct demographic groups: older Canadians (i.e. age 56 and over), and/or those whose first language is neither English nor French (i.e. "Allophones").

Working with the most recent survey data on literacy in Canada (IALS, 1994) and the most recent Canadian census (1996), I developed rough estimates of the demographic characteristics of the group in Ontario currently in the target's bull's-eye, at the lowest literacy level (i.e. Level 1 in IALS). These estimates changed my understanding of which Canadians are struggling most with low literacy skills. (Sussman, 2000)

Prior to this analysis I had uncritically accepted the view that low literacy was a significant problem for large numbers of Canadians in every demographic group. The new analysis suggested, however, that the majority of Canadian adults with the very lowest literacy skills clearly belonged to two distinct demographic groups: older Canadians (i.e. age 56 and over), and/or those whose first language is neither English nor French (i.e. "Allophones"). Additional evidence suggested that many of the other people in the lowest literacy group might have special, complex learning challenges (e.g. social/emotional problems, learning disabilities, or other physical disabilities).

These findings have highly significant implications for raising literacy levels in Canada. Failure to target these specific populations will make it much less likely that policy and program efforts will ever "move the markers" on literacy. Policies and programs need to address the motivations and needs of these population groups in order to have the greatest possible impact on the large majority of those Canadians with the weakest skills.

The results of these analyses were presented to the Board of Directors of Movement for Canadian Literacy (MCL) in September 1999. Board members saw the potential usefulness of this type of analysis to work in their own regions. With their encouragement and support, MCL asked the National Literacy Secretariat (NLS) to fund a new national research project to develop similar demographic estimates for each province and territory.

2. Literacy Rate Statistics and Public Policy Development

Public policy development is shaped by partisan and organizational politics. Nevertheless, rational arguments backed up by empirical research can exert influence on policy development in the political environment. Theoretically at least, literacy rate data is one important type of "hard" evidence that can be used to support greater rationality in the development of literacy policies and programs. This chapter looks briefly at when and how literacy rate data has influenced Canadian literacy policy and program development.

The process of developing public policy is often described in terms of stages, although the dividing lines between stages are artificial, and policy makers don't always pass through all these stages consciously, or in logical order.

2.1 ISSUE IDENTIFICATION

Public policies generally develop in response to public concerns. How does a problem like "inadequate adult literacy skills" come to be recognized as a public concern? Ross and Staines (1972) say that a problem becomes a public issue when

> interest groups organize information and take action to bring their concerns to the public eye. The media responds in accordance with the level of intensity of the action and the extent to which it is viewed as newsworthy. Public officials respond with an eye to promoting their own causes and keeping themselves in office.

Prior to the release of results from the first Canadian national survey of adult literacy, neither the public nor government officials were much concerned about adult literacy in Canada

Prior to the release of results from the first Canadian national survey of adult literacy, neither the public nor government officials were much concerned about adult literacy in Canada (Cairns, 1983). Around 1986 influential individuals with an interest in literacy persuaded the Southam Newspaper Group to commission the first

survey of adult literacy in Canada. The results of that survey were well publicized and turned the spotlight of public concern on the issue of Canadian adult literacy. Olson (1990) reports, "…A recent alarm was sounded by the Southam report on illiteracy which claimed that the level of functional illiteracy in some sections of Canada was more than 60% and increasing annually…."

Convinced by survey evidence that Canada had an adult literacy problem of major proportions, a handful of esteemed public figures, including Canadian broadcaster Peter Gzowski and Senator Joyce Fairbairn, became champions for the cause. They helped give literacy an even higher public profile.

Statistics Canada released results of their Survey of Literacy Skills Used in Daily Activities (LSUDA) in 1989. LSUDA led to more media coverage of literacy issues, and attracted more champions and organizations to literacy promotion.

The results of the International Adult Literacy Survey (IALS) were released in 1996. On the day of IALS' release advocates from four national literacy organizations held a press conference which was aired on national television, and other print, radio and television coverage followed.

By 1999 adult literacy had come to be recognized as a crucial public issue.

By 1999 adult literacy had come to be recognized as a crucial public issue. A special report on adult literacy, published in August of that year, declares

> Canada has a huge literacy problem. Millions of adults can't read well enough to handle the challenges of everyday life in the late 1990s, much less in the looming knowledge society…There's no substantive disagreement about the serious size or nature of the literacy problem…Three national surveys since 1987 plus mountains of studies have produced overwhelming statistical evidence…. (Calamai, 1999).

Three literacy surveys have, indeed, been used to great effect by advocates, bureaucrats, media representatives and public officials to build public and political awareness of adult literacy issues across the nation.

2.2 FRAMING THE ISSUE

Once a problem has been recognized as a public issue, policy and program developers frame the issue further. They ask and answer questions like:

- What is the specific problem that needs our attention?
- Who suffers from this problem?
- Who gains from it? Who doesn't?
- What causes the problem?

Literacy rate survey data and related interpretations have been used extensively in framing literacy as a policy issue. As Jones (1999) notes, three surveys have not only called attention to Canada's literacy problem, but have actually "defined a discourse about literacy".

Literacy, Economy and Society (OECD and Statistics Canada, 1996), the first international report on IALS, frames literacy as an issue crucial to economic performance of industrialized nations: "Literacy has moved to centre stage on the policy agenda because of a new phase of globalization bringing uncertainty and opportunities in terms of the use of labour." *Reading the Future* (1997), the first Canadian report on IALS, similarly focuses on literacy as an issue of human capital in an increasingly competitive global economy.

> One of the best prescriptions to exploit the new economic environment is to strengthen the capacity of firms and labour markets to adjust to change, improve their productivity and capitalize on innovation. But this capacity depends first and foremost on the knowledge and skills of the population. Literacy then will be a powerful determinant of Canada's innovative and adaptive capacity, and hence our future economic prosperity. (Statistics Canada, 1997, p. 39)

Some advocates have adopted and reinforced this way of framing Canada's literacy issue. For example, the President of ABC CANADA writes, "The threat posed to our economic well being because 40% of

the adult population is not adaptable to a changing work environment due to poor literacy skills is a clear wake-up call for any CEO". (Calamai, 1999)

2.3 FORECASTING

Forecasting is an important part of the policy development process. Intended to help policy-makers make better decisions, forecasting often uses quantitative data to develop statistical projections for the future. The following notes from a presentation on the federal government's *Skills and Learning Agenda* (1999) show the use of literacy rate data in public policy forecasting.

- Canada's demographics mean there will be fewer new workers.
- Shortages of skilled workers could restrain future growth and innovation.
- 8 million working age Canadians have low literacy standards (IALS levels 1 and 2) by international standards.
- An additional 6.5 million (IALS level 3) will need continuous upgrading/lifelong learning to participate actively in the knowledge-based economy.
- If Canada wants more post-secondary education graduates, more productivity and more growth, we need to get the fundamentals, like literacy, right.

2.4 SETTING GOALS AND PRIORITIES

Since its release, IALS data has been used to make the case for placing adult literacy at the top of the priority lists of industrialized nations.

While the demand for publicly funded services in Canada is potentially unlimited, the ability and willingness of taxpayers to foot the bill for public services is not. Decisions about the allocation of resources usually involve a priority setting process in which problems, goals, services, geographic areas and/or specific population groups are rank ordered.

Since its release, IALS data has been used to make the case for placing adult literacy at the top of the priority lists of industrialized nations. Jones (1999) notes,

> It may just be hubris on our part, but those of us who worked on IALS in Canada do draw a connection between the release of our Canadian report in September 1996, and the increased funding for the NLS, especially for workplace literacy, in the federal budget in 1997… Literacy workers in several provinces have told us that the international report [from IALS] was instrumental in preserving or increasing funding for literacy.

Rational decisions about how to address literacy problems need to be informed by literacy assessment data.

The Speech from the Throne in 2001 commits the federal government to the "goal of significantly increasing the proportion of adults with these higher-level skills".

2.5 WEIGHING THE OPTIONS

Once policy goals have been determined, options for achieving them are identified and evaluated. Rational decisions about how to address literacy problems need to be informed by literacy assessment data.

> Without such data it is difficult to determine what types of educational programs are needed and where funding should be channeled…For example, national data can be used to determine where English literacy programs and native language literacy services or bi-literacy services are needed. (*ERIC Digests*, National Institute for Literacy, 1994).

Provincial literacy rate estimates, usually derived from national studies, have been used to influence and inform provincial educational policy and program choices.

In Canada, where responsibility for education resides within the jurisdiction of provinces, provincial literacy rate estimates, usually derived from national studies, have been used to influence and inform provincial educational policy and program choices.

2.6 EVALUATION AND REVIEW

Eventually, policy outcomes are reviewed and evaluated. Expectations identified earlier in the policy development process are commonly the benchmark against which outcomes are measured. When expectations have been expressed in terms of changes in literacy rates (e.g.,

"significantly increasing the proportion of adults with…higher-level skills"), literacy rate data becomes a yardstick used to evaluate policy outcomes.

Methodological differences between each of Canada's three national adult literacy surveys make it difficult to draw direct comparisons between them (see Fagan, 199-). Nevertheless, many observers have compared the results of these surveys and found no significant improvement in literacy rates between studies. Here's how Gzowski, Canada's best-known literacy advocate, expressed his frustration with Canada's apparent failure to move the literacy markers:

The issue of adult literacy might never have gained the public and political recognition it enjoys in Canada today, were it not for the startling results of three national literacy surveys. To a considerable extent, the design of current policies and programs has been influenced by interpretations of literacy rate data.

> When I signed on in 1986 [as a literacy advocate] there were hundreds and hundreds of thousands of Canadians who needed help, and here we are thirteen years later in my case, and there are hundreds of thousands of Canadians who need help…You think, Oh my God, can we never change this? (in *Literacy Matters*, P. Calamai, 1999).

Frank McKenna, former Premier of New Brunswick, accounted for the apparent lack of progress in his province this way:

> Half the reason that we couldn't move the literacy statistics is that for all the tens of thousands [of people] we were taking out [i.e. whose skills were being improved], we were pouring tens of thousands more in from the school system. (in *Literacy Matters*, P. Calamai, 1999)

2.7 CONCLUSION

Literacy advocates and decision makers use literacy rate statistics to influence the development of literacy-related policies and programs. The issue of adult literacy might never have gained the public and political recognition it enjoys in Canada today, were it not for the startling results of three national literacy surveys. To a considerable extent, the design of current policies and programs has been influenced by interpretations of literacy rate data.

3. Methods of Estimating Population Literacy Rates: Strengths and Limitations

A senior researcher in the field of adult literacy offers the following advice: "When someone asks you 'how many Canadians have problems with literacy', ask them 'How many do you want?'" (Sticht, 2000). He's joking (I think), but he means to make a serious point. There's no shortage of numbers claiming to quantify the dimensions of Canada's adult literacy challenges. There is, however, a shortage of consensus on what the numbers actually mean, what their limitations are, how they should be used, and who should be using them. Murray (1999) notes that some even question whether assessment data should be collected in the first place.

"When someone asks you 'how many Canadians have problems with literacy', ask them 'How many do you want?'"

This chapter describes and discusses the technical and conceptual issues associated with all methods of estimating population literacy rates, including those associated with the project described in this report. People involved in literacy policy development need to know about and understand these issues in order to be critical users of literacy rate research.

There's no shortage of numbers claiming to quantify the dimensions of Canada's adult literacy challenges. There is, however, a shortage of consensus on what the numbers actually mean.

Four approaches to developing literacy rate estimates have been used to date, each with its own strengths and limitations. Notions about the nature of "literacy" are either explicit or implicit in all measurement approaches. And this is where difficulties in establishing literacy rates begin.

Competing notions about the nature of literacy are briefly described below. This is followed by a summary of the four approaches commonly used to develop literacy rate estimates, and a discussion of the strengths and limitations of each. The chapter concludes with a look at the strengths and limitations of the approach taken in the current project.

3.1 NOTIONS OF LITERACY

The literature reflects what has become a tradition of agreeing to disagree in the literacy field when it comes to definitions of literacy and illiteracy

Stakeholders who do not agree on the nature of literacy are unlikely to agree on how to measure it.

The literature reflects what has become a tradition of agreeing to disagree in the literacy field when it comes to definitions of literacy and illiteracy (Macias, 1990, 1993, 1994; Mikulecky, 1990; Venezky, 1992 ; Sticht 2000; Haute Coeur 1990; Venezky and Wagner, 1994; etc). There is no consensus about what it means to be literate. Stakeholders who do not agree on the nature of literacy are unlikely to agree on how to measure it.

Some conceptions of literacy lend themselves more easily to measurement than others. Nevertheless, it is important to remember that regardless of the words used to define literacy, definitions should not be confused with what any specific assessment method actually measures. Even if one agrees with the definition of literacy stated in a survey report, one may not agree that the survey produces a valid measurement of literacy even as it has been defined.

Regardless of the words used to define literacy, definitions should not be confused with what any specific assessment method actually measures.

Notions of literacy differ depending on whether literacy is conceived of as narrow or broad, absolute or relative, fixed or dynamic, singular or multiple, autonomous and transferable or contextually specific.

3.1.1 Narrow or broad

Notions of literacy differ in terms of where literacy begins and ends; that is, which combination of skills, knowledge, attitudes and behaviours is included within the term literacy, and which go beyond the boundaries of the term. Hautecoeur (1990) observes "…If we stop at the literal or strict sense of the word (illiteracy), that of zero written communication for a population or individual, all ambiguity disappears and the number of Canadians to whom one might apply the term is minute...".

Others suggest that literacy includes a vast continuum of skills connected to using written or printed matter used at work, at home or in social activities. Some view literacy as a set of cognitive information-processing skills involved in analyzing, organizing, comparing and interpreting elements of a text. Others go further and

suggest that literacy encompasses not only an array of information-processing skills but also culturally specific communication practices.

3.1.2 Absolute or relative

As recently as two decades ago, literacy was conceived of in absolute terms of "on/off", or "all/none". Either you were literate or you were not. Literacy, as an absolute concept, meant being able to meet a specific performance benchmark. For example, in 1948 the United Nations Educational and Scientific Cooperation Organization (UNESCO) defined literacy "having completed 8 years of formal education". In 1978 UNESCO revised its definition of literacy, but still treated it in absolute terms. "A person is literate who can with understanding both read and write a short simple statement on his everyday life".

In the past quarter century experts have come to agree that literacy cannot be adequately described in absolute terms. Rather than portray literacy as an "all or none" phenomenon, relativistic definitions describe literacy as a continuum of ability—ranging from lower to higher.

Robinson (1963) proposed a five-step Stairway of Literacy moving from complete illiteracy, to low-level literacy, to partial literacy, to variable literacy and finally to complete literacy. Harris (1970) identified three levels of illiteracy and described these in terms of a person's inability to read well enough to survive in American culture (low survival, questionable survival, and marginal survival). Statistics Canada used four proficiency levels to describe the literacy skills of Canadians in LSUDA (1989). Chall (1990) suggested six stages of reading skill levels, which she later collapsed into three levels. Statistics Canada expanded the continuum model of literacy by describing literacy in terms of five proficiency levels along three separate scales (i.e. prose, document and quantitative) in IALS (1994). Newman and Beverstock (1985) observe that literary "stages and levels had become ideological orthodoxy…during these years (the mid- to late 80s), and whether a set of three or five or seven such orderly categories adequately described the many dimensions of literacy, the labels tended to stick".

Newman and Beverstock (1985) observe that literary "stages and levels had become ideological orthodoxy…and whether a set of three or five or seven such orderly categories adequately described the many dimensions of literacy, the labels tended to stick".

3.1.3 Static or dynamic

The Oxford dictionary defines literacy as "the ability to read and write" (1995), making no mention of the "purposes" people have for reading and writing, the context in which reading and writing occurs, or the notion of comprehension as part of literacy.

Some conceptions suggest literacy is a static ability like riding a bicycle — once you've learned how to read (or ride) you never forget. Others suggest that the mechanisms of literacy are more like muscles — developed through use and lost if under-utilized (Jones, 1996). Still others hypothesize a skill threshold for literacy skills that must be reached before an individual will consistently use and retain whatever literacy skills s/he has acquired (Bebko, 2000).

3.1.4 Singular or multiple

The Oxford dictionary defines literacy as "the ability to read and write" (1995), making no mention of the "purposes" people have for reading and writing, the context in which reading and writing occurs, or the notion of comprehension as part of literacy. In contrast, some authors say there are multiple literacies (Scribner and Cole, 1981; Heap, 1990). For example, Heap (1990) describes the literacy central to general education, specialized functional literacies, lay literacy or general understandings about reading and writing, and scribal literacy or the simple ability to read and write.

Blair (1990), on the other hand, questions the trend that has stretched the concept of literacy beyond reading and writing to include such things as computer literacy and cultural literacy. He suggests that what is common to all the literacies is the ability to deal with any context of meaning. However, he cautions that literacy in its root sense—the ability to read and write—might require mental abilities and dispositions quite difference from these other literacies.

3.1.5 Autonomous or contextually specific

Literacy is sometimes conceived of as a set of discrete skills that are independent of context. In contrast, the "contextual" view suggests literacy should be considered only within a particular context of functioning. Context and therefore literacy may change from one country/culture to another, or over time. Street (1993) argues that literacy should be viewed from an ideological perspective, which

includes issues of how literacy practices relate to dominance and differences in power between groups. Thus literacy is more than mere isolated skills. It exists in social, economic, and political contexts.

3.1.6 When definitions differ

People tend to filter literacy assessment data through their own understanding of the word "literacy". Those operating from significantly different understandings of literacy and interpretations of literacy assessment data often find it difficult to agree on (or even discuss) how to measure and why and how to improve the literacy skills of Canadians.

People tend to filter literacy assessment data through their own understanding of the word "literacy".

An excerpt from the transcript of a pre-budget meeting of the Finance Committee of the House of Commons demonstrates this dynamic. Representatives of national literacy organizations met with Members of the Finance Committee in 1996 to advocate for increased funding for literacy programs. Representing the Movement for Canadian Literacy at that meeting, I made the following comment in my presentation. "… When we say there is a major problem in literacy in Canada today …we are talking about the ability to decode and then take meaning and be able to use the information that comes in print."

A member of the committee, M.P. Herb Grubel, (Capilano–Howe Sound, British Columbia), replied,

> What you are describing is the ability to reason analytically, rather than literacy…This has been very informative for me. I have now learned the reason why my students failed some of my examinations in Economics. It was because they were illiterate, not because they did not study or they did not understand analytical reasoning or they did not have mental discipline… I don't find that a particularly useful use of the term "literacy". I think you are depreciating the value of the entire concept if you extend it that far. All you're doing really is saying that some people have more education than others.

All estimates of literacy rates have been based on one or some combination of the following measurement approaches: self-assessments, surrogate (or proxy) measures, direct assessments, and finally, synthetic estimates. Each of these methods has its own strengths and limitations.

3.2 FOUR APPROACHES TO ESTIMATING POPULATION LITERACY

One newspaper headline sounds the alarm, "4.5 million Canadian adults with poor literacy skills". Another declares, "Canada's literacy rate leads the world at 98%". Where do these numbers come from? What do they really mean?

All estimates of literacy rates have been based on one or some combination of the following measurement approaches: self-assessments, surrogate (or proxy) measures, direct assessments, and finally, synthetic estimates. Each of these methods has its own strengths and limitations (see Figure 2).

3.2.1 Self-assessments

Definition

The "self-assessment" (or "self-report") approach to literacy measurement relies on survey respondents to assess their own skills, by answering questions like the following:

- Can you read?
- How well do you write?
- How do you rate your reading or writing skills: Excellent? Good? Fair? Poor?
- How many people in your household read?
- Can you write a simple statement?
- Can you sign your name?

Implementation

Self-assessment questions are commonly incorporated into larger surveys that have been designed to serve broader purposes, such as a national census.

Figure 2. Four methods of developing literacy rate estimates

Measurement	Defined	Strengths	Limitations
1. Self assessment	● Individuals assess their own skills	● Practical, clear, easy to explain, and comparable ● Inexpensive when part of a broader survey	● Subjective, inconsistent ● Interpreted, unreliable
2. Proxy	● Characteristics assumed or shown to have strong correlations with literacy proficiency are taken as indicators of literacy	● Practical, clear, easy to explain and comparable. ● Relatively inexpensive as additional costs associated with collecting new data are reduced or eliminated	● Extent to which they are regarded as valid and reliable surrogates for the "real thing"
3. Direct	● Actual performance on a test or on literacy tasks	● Reliable (i.e. "repeatability" or consistency of research findings tasks) ● Gives air of credibility	● Complex, difficult, time-consuming and expensive to design and implement ● Concerns related to validity
4. Synthetic estimates	● Information from various sources combined to create estimates that are not available in any one source by itself	● Extends the usefulness of other surveys; low cost	● Error if literacy correlates in any given prediction area differ from the model

History

Analyses of self-assessments of literacy, collected through census questionnaires, date back to the mid-1800s in Canada and the United States. Between 1840 and 1940, the U.S. census routinely asked respondents: "Can you read or write, or both?" Starting with the 1860 census of Upper and Lower Canada, respondents were asked to make a mark in the appropriate space, if anyone in the household was unable to read or write.

IALS's self-assessment data has been compared with direct measures of literacy skills to demonstrate the gap between how people view their own skills and their actual performance. The gap is huge.

The 1994 International Adult Literacy Survey (IALS) included a question that asked respondents to rate their own reading, writing and numeracy skills. IALS's self-assessment data has not been used to produce estimates of population literacy rates. Instead, it has been compared with direct measures of literacy skills to demonstrate the gap between how people view their own skills and their actual performance. The gap is huge.

Strengths of self-assessments

The main strengths of self-assessment methods lie in their practicality, clarity, and comparability. When they are part of a broader survey, such as a general census, self-assessments are inexpensive to administer and findings are easy to explain to others. Data from one census to the next can yield comparative data on trends, especially if the wording of questions has not changed.

Limitations of self-assessments

Self-assessment methods rely on the subjective judgments of those who answer the question. Furthermore, the terms used in questions may be unclear to some respondents. Rating scales (e.g. rate your skills: excellent, good, moderate or poor; use a 5 point scale to rate your skills, where 1 is low and 5 is high) may be interpreted inconsistently from one respondent to the next. For all these reasons the self-assessment approach to measuring literacy is usually regarded as unreliable. Self-assessment questions about literacy were dropped from the Canadian census starting in 1930, and from the U.S. census starting in 1940.

Self-assessments tend to produce higher literacy ratings than other types of assessment. Some experts conclude that self-assessments tend to overestimate high literacy levels in the population. Others have suggested that other assessment methods may artificially inflate estimates of the number of people with poor skills and that self-assessments may be more accurate.

3.2.2 Proxy (or surrogate) indicators

Definition

The word "proxy" (or "surrogate") means letting one thing stand in for another. In the proxy method of estimating literacy, characteristics assumed or demonstrated to have strong correlations with literacy proficiency are measured. Those measures are then taken as indicators of literacy.

It's interesting to note that historians attempting to estimate literacy rates in times long past have relied on counts of the number of adults who signed their own full names on official records.

Implementation

Literacy rate estimates based on proxy measures usually rely on data that has already been collected. Census surveys are the most common source of that information.

History

The proxy measure for literacy used most often is years of schooling (or educational attainment), although it's interesting to note that historians attempting to estimate literacy rates in times long past have relied on counts of the number of adults who signed their own full names on official records. Around the 1930s, as self-assessment questions were being dropped from U.S. and Canadian census surveys, measures of educational attainment, already included in the census, were adopted as proxies for literacy.

Where educational attainment has been used as the proxy for literacy, the number of years of schooling required to meet the standard for literacy has risen over time. This is based on the assumption that ever-higher literacy skills are needed to keep up with ever-increasing literacy demands encountered in daily living.

Where educational attainment has been used as the proxy for literacy, the number of years of schooling required to meet the standard for literacy has risen over time.

In 1930, the Civilian Conservation Corps in the U.S. used completion of the fourth grade as its standard for literacy. In 1949 the U.S. census set the standard at 5 years of schooling. By the 1960s, the bar had been raised to the completion of 8 years of school. The 1980 U.S. census set 9 years of education as the standard for literacy. Thomas's 1983 report on adult illiteracy in Canada estimated the "undereducated" out-of-school population 15 years of age and over,

based on 1976 census data on educational attainment data. The "literacy bar" at that time was set at a grade 9 level of education.

Reports of a 98% literacy rate in Canada are based on the literacy standard adopted by UNESCO in 1960: the portion of the population with five or more years of formal schooling. When adopting that standard UNESCO was primarily interested in tracking the development of literacy in third world nations.

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Sticht (1999) sparked controversy by proposing a new proxy measure for literacy. Citing research that shows strong correlations between vocabulary test scores and direct measures of literacy skills, Sticht suggests that vocabulary tests administered over the telephone could produce reliable, low-cost estimates of literacy skills.

Strengths of proxy indicators

The main strengths of proxy measures lie in their practicality, clarity, and potential comparability. Since proxy data is usually drawn from existing statistical information, additional costs associated with collecting new data are reduced or eliminated. Proxy measures are relatively easy to explain, and on the surface they appear to provide comparable data from one assessment to the next.

Prior to IALS, most international comparisons of literacy were based on proxy indicators. However, researchers have been warned to interpret such comparisons cautiously, because official statistics published by national and international agencies are often less accurate than they appear to be. Different nations may use different types of proxy measures, and different criteria to decide if people are literate, at different times (ERIC Digest).

Proxy measures for literacy are limited by the extent to which they are regarded as valid and reliable surrogates for the "real thing".

Limitations of proxy indicators

In general, proxy measures for literacy are limited by the extent to which they are valid and reliable surrogates for the "real thing". Literacy estimates based on educational attainment assume a strong relationship between literacy skills and time spent in school. However, the correlation between time in school and literacy is not perfect. For example some portion of high school graduates have been shown to

have weak literacy skills, while other people with less formal education have strong skills. Thus, the adequacy of educational attainment data as a proxy for literacy has been questioned.

Educational attainment data fails to account for differences between schools and the effects those differences may have on literacy skill acquisition. Schools differ significantly in terms of their resources, teachers, values, communities served, and more. Those who attend a "very good school" might develop higher levels of literacy than those who attend a "poor" school for the same number of years.

3.2.3 Direct measures of literacy proficiency

Definition

Direct measures of literacy are based on actual performance on a test or on literacy tasks. An examiner generally assigns these tests and/or tasks, and test performance is observed or evaluated by an examiner or rater.

Implementation

Direct measures are routinely used all over the world with learners of all ages. These measures range from simple, inexpensive, non-standardized tests developed and administered by individual educators to individual students or groups of students, to sophisticated, expensive assessment measures rigorously developed and pre-tested by evaluation experts and administered by trained examiners to selected population samples in highly prescribed ways. Direct measures of population literacy rates have involved complex, costly large-scale studies.

History

The United States began investing in large-scale direct assessments of adult literacy more than a decade before Canada made the effort. Several US studies clearly contributed and led to the design of IALS. The Adult Proficiency Level (APL) test was carried out in the U.S. in the 1970s. The English Language Proficiency Assessment (ELPA) came

Non-statisticians are more likely to rely on "experts" to tell them what the measures say and mean when the measurement tools are highly sophisticated and complex.

next in 1982, followed by the Young Adult Literacy Survey (YALS) in 1985 and the National Assessment of Educational Progress (NAEP) survey of young adults aged 21-25 in 1986. The National Adult Literacy Survey (NALS) was carried out in the U.S. in 1992.

The Southam Newspaper Group commissioned the first direct assessment of adult literacy in Canada in 1987. 2,398 Canadian adults were tested on a battery of more than 40 literacy-related questions. According to the results of that survey, at least 4.5 million Canadian residents (i.e.24%) failed to "reach a minimum level of functional literacy suggested by a national panel representing a cross-section of Canadians." (Calamai, 1990)

In 1989, Statistics Canada conducted the Survey of Literacy Skills Used in Daily Activities (LSUDA) to measure the literacy skills of over 9000 Canadian adults, aged 16 to 69. The figure most widely quoted from LSUDA indicated that 38% of Canadian adults were not "functioning at the required reading level to meet daily demands." (Statistics Canada, 1990)

The International Adult Literacy Survey (IALS) is based on the same methods developed for the National Adult Literacy Survey (NALS). IALS is the most ambitious and most recent large-scale assessment of Canadians' literacy skills available so far. IALS was conducted in 1994 by Statistics Canada in cooperation with the Organization for Economic Cooperation and Development (OECD), IALS measured proficiency at five different skill levels, within three different types of literacy. Based on IALS, 22% of Canadians aged 16 and over are at Level 1, and 26% are at Level 2, where Level 3 is considered the minimum skill level for successful participation in today's society.

Strengths of direct measures

Reliability is the greatest strength associated with large-scale direct assessments. Reliability refers to the "repeatability" or consistency of research findings. Carefully designed and controlled direct measures of literacy are more likely to produce consistent results from sample to sample or time to time, than other types of assessment methods.

The sophistication and complexity of large-scale direct assessments lend them an air of credibility. The reasoning is as follows: if so many experts and so much time and money have gone into producing these measures, they must be good.

Limitations of direct measures

The literature points to myriad technical and conceptual limitations associated with large-scale direct measures of literacy. From a technical perspective, large-scale direct measures are complex, difficult, time-consuming and expensive to design and implement. Large-scale measures also tend to be difficult to explain to policy-makers, journalists, advocates and the general public. Non-statisticians are more likely to rely on "experts" to tell them what the measures say and mean when the measurement tools are highly sophisticated and complex.

Conceptual limitations associated with large-scale direct measures strike at the very heart of the measurement issue. Many researchers question the validity of all the direct measures used so far, arguing that the measures fail to provide a sound or defensible basis for knowing about a person's "real", functional literacy skills in "real-life" situations. Their concerns are related to construct validity, ecological validity, internal validity, external validity, standards validity and statistical validity.

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External validity refers to the degree to which the results of a study can safely be generalized to apply to settings and parameters outside those of the original study, such as to other populations, times, places, similar tasks, and other measurement instruments. For example, Hunter and Harman (1979) contend that cultural biases undermined the external validity of the Adult Proficiency Level (APL) test. They argue that only the person or group involved can really describe what constitutes effective functioning in his or her own cultural group. They note that the APL measured competencies derived from middle class norms and behaviours.

Macias (1993; 1994) challenges the external validity of direct assessments of population literacy rates because of how language

diversity is managed in these assessments. He notes that surveys administered only in a nation's official languages tend to equate literacy with official language literacy. This inflates the perception of the extent of a literacy crisis while stigmatizing those who are literate in non-official languages. Supporting evidence comes from the National Chicano Survey (NCS), carried out in the U.S. in 1979. NCS measured literacy in English and Spanish. If performance in English had been the sole criterion for measuring literacy, 48% of the tested population would have been counted as illiterate; however, when literacy in either Spanish or English was assessed the percentage of illiterates dropped to 26%.

Surveys administered only in a nation's official languages tend to equate literacy with official language literacy. This inflates the perception of the extent of a literacy crisis while stigmatizing those who are literate in non-official languages.

Construct validity refers to the degree to which the measurement tool used in a study accurately reflects the conceptual question of interest. Kazamek (1988) says that studies like the APL can never provide an adequate understanding of literacy rates because they "attempt to measure a relative, particular and situationally specific process in a universal and quantifiable manner."

Ecological validity refers to the extent to which the results of the literacy assessment are representative of the way literacy is actually used in the real world, and the extent to which differences in context (from test situation to real world application) are likely to impact on the conclusions drawn. Heap (1990) believes that the available studies misrepresent the competence required to solve real world problems. For example, he notes that as presented in a test situation a task might require a participant to solve a problem only by reading or writing. In the real world, however, that individual may be able to perform the task through a variety of routes, including ones that do not rely exclusively on reading or writing.

Basu says that in order to understand how literacy is affecting people's lives, we need information not just about an individual's literacy skills, but also about the skills of others in the same household.

Thus Heap differentiates between text-based, text-aided and text-omitted functioning. In the first, one must rely on text alone to perform; in the second, text helps with performance but other aids (e.g., pictures, situational cues, colleagues) are available; in the third, text processing is not required at all to achieve a particular goal. Heap argues that direct assessments so far have only measured text-based functioning, whereas in real life, either text-aided or text-omitted functioning may be equally or more rational and/or appropriate.

Although Basu's (1998) work focuses on literacy in developing nations, some of his observations are also relevant to literacy in Canada. He contends that the effects of illiteracy are mediated by one's access to others who are literate. He says it is one thing to be illiterate or have low literacy if there is access to someone else in the household who is sufficiently literate; it is another thing to lack literacy skills and be without such ease of access to someone who can help. Thus Basu says that in order to understand how literacy is affecting people's lives, we need information not just about an individual's literacy skills, but also about the skills of others in the same household.

The most significant concerns to date about the validity of recent large-scale direct assessments of literacy come from the original project director for NALS.

The most significant concerns to date about the validity of recent large-scale direct assessments of literacy come from the original project director for NALS. Andrew Kolstad's comments are found in a huge technical report on NALS from the National Center for Education Statistics (NCES, 2001) published ten years after that hugely influential study. Kolstad now believes that overly strict statistical assumptions built into NALS resulted in overly pessimistic estimates of literacy rates in the U.S.

Kolstad now believes that overly strict statistical assumptions built into NALS resulted in overly pessimistic estimates of literacy rates in the U.S.

> Kolstad's comments cast a large shadow of doubt over the entire NALS test…[He] systematically undermines the entire test and questions its construct validity, that is, the question of just what it is that the test measures, its standards validity, that is, the validity of the 80 percent probability standard that was used to assign people to the five literacy levels, and the use validity, that is the validity of the NALS for accurately identifying adults at risk for poor literacy skills. (Sticht, 2001)

It is important to note here that IALS is founded on and incorporates the same statistical assumptions as those in NALS.

Provincial demographic profiles of literacy, presented in this report, were developed using synthetic modeling methods similar to those used by Statistics Canada.

3.2.4 Synthetic estimates of literacy proficiency

Definition

Synthetic estimates of literacy combine information from various sources to create estimates that are not available in any one source by itself.

Implementation

Statisticians create synthetic estimates of literacy by identifying variables most likely to predict literacy proficiency existing survey data. Sophisticated statistical calculations based on these variables are then used to develop a statistical "predictor model for literacy". The predictor model, in turn, is "mapped" onto census information about populations in other geographic areas. This produces synthetic estimates of literacy proficiencies in specific geographic areas.

History

Synthetic estimates of literacy proficiency based on data from the 1993 National Adult Literacy Survey (NALS) were developed for U.S. states, counties, Congressional districts, and cities with adult populations over 5,000. Statistics Canada has produced synthetic estimates of literacy based on IALS (1994) and Canadian census data, for every federal riding, and also local area synthetic estimates on request for specific local communities across Canada.

Provincial demographic profiles of literacy, presented in this report, were developed using synthetic modeling methods similar to those used by Statistics Canada.

Strengths of synthetic estimates

Synthetic estimates are essentially statistical extrapolations of findings from other types of literacy assessments. As such, they do not take the place of those other assessments, and both the strengths and limitations of the original data affect the quality of these estimates.

The chief value of synthetic estimates is that they can extend the usefulness of other surveys by providing a cost-effective means of

estimating literacy levels in geographical areas not adequately sampled by the original assessment.

Limitations of synthetic estimates

Synthetic estimates for literacy in provinces or states, cities and local communities can be developed based on national survey data only if the same model which predicts literacy levels for the nation as a whole can be assumed to predict literacy in each of the smaller geographic areas. Several researchers believe this is a reasonable assumption with respect to estimates for large areas with heterogeneous populations, but not for smaller areas where populations are more likely to be distinct in some way.

The key risk of error in developing synthetic estimates is that there may be literacy correlates in any given prediction area (i.e. the specific province or specific local area) that are different from the model, or are not covered by a variable in the model. For example, suppose a province or district looks similar to others in terms of the variables used in the predictor model (e.g., gender, education, age and language) but differs from others in that it has an unusually high number of people with visual impairments. Now suppose further that visual impairment correlates with lower literacy levels. If visual impairment has not been one of the variables used to develop the predictor model literacy levels in the area would tend to be over-estimated, because the unusually high rates of vision problems in the area have not been factored into the equation.

Provincial estimates probably have fewer errors than smaller area estimates because:

- the risk of extreme population differences is lower in provinces (states) than they are in smaller, local areas; and
- local peculiarities tend to iron out at the provincial level of aggregation.

In any case, it is important to keep in mind that all provincial/state and local area estimates are estimates with margins of error.

4. Overview of Data Analysis Methodology

The primary objective of this project, originally, was to identify demographic patterns in low literacy amongst Canadian adults, based on a review of the best available statistical data on low literacy. The best available source of data for the purposes of this project is the International Adult Literacy Survey (IALS). There are three reasons why this is so:

- Literacy rate estimates derived from direct assessments of literacy skills are generally seen as more reliable than estimates based on proxy measures or self-reports of literacy skills.
- IALS is the most recent comprehensive study of Canadian adult literacy rates based on direct assessment of literacy skills.
- IALS provides a great deal of demographic information about survey participants.

This chapter provides a brief summary of key elements of the IALS study (Section 4.1), an overview of the data analysis methodology used in this project (Section 4.2), and a brief discussion of the limitations of the current project's methodology. Those who want to know more about IALS are referred to *Reading the Future: A Portrait of Literacy In Canada* (1996).

4.1 IALS IN BRIEF

4.1.1 Sponsorship of IALS

IALS was conducted in 1994 by Statistics Canada in cooperation with the Organisation for Economic Cooperation (OECD). The primary objective of IALS was to make it possible to compare the literacy rates of different nations. IALS provides information about Canadian literacy rates and comparable data for 19 other key trading partners that participated in the survey.

4.1.2 Sample in IALS

In total, 5660 individuals in Canada 16 years of age and over participated in IALS. The sample for IALS was drawn from Statistics Canada's Labour Force Survey (LFS) Frame. The LFS Frame is used by Statistics Canada for many important purposes. Even so, LFS has some important limitations. The LFS excludes residents of the Northwest Territories, Nunavut and Yukon, people living in institutions, people living on Indian reserves, people who are homeless, and full-time members of the Canadian Armed Forces. Since IALS drew its main sample from the LFS frame, IALS's data also excludes people in these categories.

4.1.3 Administration of IALS

IALS combined direct assessment techniques with those of household survey research. Interviewers met with survey participants in the participants' homes. First, participants were asked questions about their backgrounds, their demographic characteristics, their reading habits, and the reading demands they encounter at home and at work. They were also asked to rate their own reading, writing and math skills.

Then participants were asked to complete a series of tasks involving print materials. The print materials came from three different "domains": prose, document and quantitative. According to IALS researchers the print materials and tasks presented were similar to those that are encountered in everyday life.

In Canada IALS was administered in either English or French. Each survey participant chose which of these two languages s/he would be tested in. Therefore it is important to note that for Canadians, IALS measures literacy only in either English or French, rather than literacy in the participant's mother tongue or any other language of choice.

It is also important to note that while literacy is generally understood to include both reading and writing skills, IALS only measures reading-related performance. This is a significant limitation, since an individual's ability to read is not necessarily the same as their ability to write.

4.1.4 Theoretical underpinnings of IALS

IALS is based on a theory of adult reading that considers three aspects of the reading experience:

- the information-processing skills and/or knowledge a reader brings to the reading task;
- the content and format of the text being read; and
- the complexity of the task the reader tries to accomplish by reading.

Survey participants were presented with texts that varied in terms of their content and format. They were asked to perform reading-related tasks that ranged from simple to complex. Information published by Statistics Canada provides the following examples of IALS tasks and task demands.

> The easiest task in Level 1… directs respondents to look at a medicine label to determine the "maximum number of days you should take this medication". The label contains only one reference to number of days and this information is located under the handing "Dosage". The reader must go to this part of the label and locate the phrase "not longer than 7 days". (Backgrounder on the IALS, page 4.)

In comparison, a Level 5 task,

> …requires the reader to look at an announcement from a personnel department and "list two ways in which [the company] helps people who will lose their jobs because of a departmental reorganization". The correct response requires readers to search through this text to locate the embedded sentence "The [company] acts as a mediator for employees who are threatened with dismissal resulting from reorganization, and assists with finding new positions when necessary". This task is difficult because the announcement is organized around

> information that is different from what is being requested in the question. Thus, while the correct information is located in a single sentence, this information is embedded under a list of headings describing the [the company's] activities for employees looking for other work. This list of headings serves as an excellent set of distractors for the reader who does not search for or locate the phrase containing the conditional information stated in the directive…

IALS measures more than the ability to decode. By asking increasingly complex questions about various text samples, IALS also measures higher-level information processing skills that are involved in using print for various purposes.

Thus IALS measures more than the ability to decode (i.e. recognize letters, associate them with the sounds they represent, and combine them into words, sentences and texts). By asking increasingly complex questions about various text samples, IALS also measures higher-level information processing skills that are involved in using print for various purposes. These include the ability to analyze, organize, and compare and interpret elements of a text, often drawing on one's previous knowledge.

A scaling technology called Item Response Theory (IRT) was used to measure the cognitive complexity of each test item. Each test item was rated on a scale (a separate scale for each domain) of 0 – 500. Simpler tasks had lower scale scores, and more complex tasks had higher scores. Each scale was then divided into five literacy levels (Levels 1 through 5), based on shifts in cognitive skills and strategies researchers claim are required to successfully complete test items (see Figure 2).

4.1.5 Scoring and reporting results

On the basis of their tested performance, participants in IALS were assigned to one of five literacy levels; Level 1 being the lowest, and Level 5 the highest. Note that IALS did not include a Level 0. Each participant was assigned to Level 1 at a minimum, even if he or she was unable to complete any task at any level.

To be ranked at any level higher than Level 1, the participant had to have an 80% probability of correctly responding to questions at the

Figure 3. Scale Score Ranges, Prose Literacy Levels and Prose Task Features

SCALE SCORE	LITERACY LEVEL	TASK DEMANDS/COGNITIVE SKILLS REQUIRED
0 – 225	**1**	Reader is required to locate one piece of information in the text that is identical or synonymous to the information given in the test direction. If a plausible incorrect answer is present, it tends not to be near the correct information.
226 – 275	**2**	Reader is required to locate one of more pieces of information in the text, but several distractors may be present, or low-level inferences may be required. Tasks at this level also begin to ask readers to integrate two or more pieces of information or to compare and contrast information.
276 – 325	**3**	Reader is required to search texts to match information that requires low-level inferences or that meets specified conditions. Sometimes reader is required to identify several pieces of information located in different sentences or paragraphs rather than in a single sentence. Readers may also be asked to integrate or compare and contrast information across paragraphs or sections of text.
326 – 375	**4**	Reader is required to perform multiple-feature matching or to provide several responses where the requested information must be identified through text-based inferences. May also require reader to integrate or contrast pieces of information, sometimes presented in relatively lengthy texts. Typically these texts contain more distracting information and the information that is requested is more abstract.
376 – 500	**5**	Reader is required to search for information in dense text that contains a number of plausible distractors. Some require reader to make high-level inferences or use specialized knowledge.

Source: adapted from Statistics Canada, Reading the Future, p 87.

higher level. For example, if a participant responded correctly to 8 out of 10 questions or more at Level 3, s/he would to be assigned to Level 3. If s/he only got 7 out of 10 questions right at Level 3 s/he would not be placed at that level. Instead, assuming s/he got at least 8 out of 10 Level 2 questions correct, s/he would be placed in Level 2. Each participant was assigned to the highest level at which his/her probability of responding correctly was at least 80%.

The Level 1 group (the lowest skill group) is comprised of people with a wide range of literacy proficiencies (from 0–225 on the scale

Level 1 includes the widest range of abilities of any of the five levels in IALS — from people who are unable to correctly answer even one simple Level 1 question, to those who correctly answered all Level 1 questions and even some at Levels 2, 3 or higher, but with less than an 80% probability of being able to correctly respond to the questions at those higher levels.

scores). In fact Level 1 includes the widest range of abilities of any of the five levels in IALS — from people who are unable to correctly answer even one simple Level 1 question, to those who correctly answered all Level 1 questions and even some at Levels 2, 3 or higher, but with less than an 80% probability of being able to correctly respond to the questions at those higher levels.

IALS' researchers suggest that Level 3 skills, at a minimum, are generally required to meet the literacy demands of every day life in the "knowledge-based economy". Level 3 has been taken as the marker for adequate literacy skills, and people at Levels 1 and 2 have been regarded as needing to improve their skills.

The results of IALS are reported separately for performance in prose, document and quantitative domains. Statistics Canada's reports emphasize that significant portions of all age groups and all language-use groups perform at each of the two lowest literacy levels in all three domains. These interpretations have helped position literacy as a mainstream concern. In turn, this has helped establish and maintain a prominent place for literacy on the public agenda.

4.2 OVERVIEW OF DATA ANALYSIS METHODOLOGY USED IN THIS PROJECT

Level 3 has been taken as the marker for adequate literacy skills and people at Levels 1 and 2 have been regarded as needing to improve their skills.

For the purposes of this project the original dataset from IALS was analyzed in three steps.

1. First, Canadian national data on literacy levels was examined in each of three domains (prose, document and quantitative). For each domain separate cross-tabulations were created to show the relationship between literacy levels and age, education levels and language use. Cross-tabulations examine the effect of one variable on literacy at a time.

2. Then, in order to account for the effect of two or more variables at the same time, regression analyses were performed for each domain (prose, document and quantitative) predicting Levels 1 and 2. The results of these regressions were used to develop a "national predictor model" for literacy.

3. Third and finally, demographic profiles of adult literacy in each province were estimated from the national predictor model and data from the 1996 Census.

4.2.1 Methodological considerations in the current project

Dr. Michael Ornstein, Director of the Institute for Social Research at York University, designed and carried out all the statistical analyses associated with this project, in consultation with Susan Sussman, project director. The analyses are based on the original Canadian data set from the 1994 International Adult Literacy Survey (IALS).

Sample size considerations

Originally we planned to develop separate analyses and estimates for each province and territory based on the IALS samples from each province and territory. But the provincial samples were not large enough to support this. Moreover, the IALS sample excludes people who reside in Canada's three northern territories: Yukon, Northwest Territories, and Nunavut.

Given the sample size limitations associated with IALS, three options were considered:

- Wait for the results of the 2003 International Adult Literacy and Skills Survey (IALSS) before developing provincial demographic estimates (projected to be available in autumn of 2005). In other words, delay this project.
- Combine the provinces into regions, to create larger samples on which to base estimates for provinces within those regions.
- Use effects identified through an analysis of the complete IALS sample to develop "synthetic" provincial demographic estimates.

Wait until 2005 for the results of IALSS

The 2003 IALSS will have a much larger sample size than IALS (approximately 40,000 people will be sampled; 25,000 are expected to respond), with large enough samples from each province and territory, to produce highly reliable provincial/territorial estimates. However,

the results of IALSS are not expected to be available until late in 2005. In the meantime, important decisions about literacy policies and programs are being made.

Produce regional estimates

Combining the provinces into "regions" (Quebec, Ontario, Atlantic Canada, and Western Canada/Prairies) still leaves small samples upon which to base provincial estimates. Moreover, there are substantial population differences between provinces within the latter two regions. Nevertheless, separate regression analyses were run for each region. From these Dr. Ornstein observed that the effects of gender, age, education and language on prose literacy were similar in all regions.

Model provincial demographic estimates

At national and provincial levels, Canada's population is heterogeneous. Each province's population is comprised of a mix of people of both genders, at all ages, with varying levels of education, and diverse origins. Given this, it is reasonable to assume that the mechanisms affecting literacy in each province are generally the same.

Based on this assumption, Dr. Ornstein decided to use the national data set from IALS to develop a national predictor model, and then map that model onto provincial census data. This modeling approach has previously been used by Statistics Canada to develop provincial estimates and Dr. Ornstein believes that the method produces reasonably reliable and valid "synthetic estimates" of demographic profiles of literacy at the provincial level (see Chapter 5 for further discussion about the development and use of "synthetic estimates").

Dr. Ornstein concluded that reasonably reliable estimates for the territories based on the national model and census data could *not* be developed because Canada's three northern territories are much less heterogeneous than the national population as a whole. Furthermore, census data for the territories is incomplete. Unfortunately, this project has not been able to fill the information gap concerning literacy rates and the demographics of low literacy in the territories.

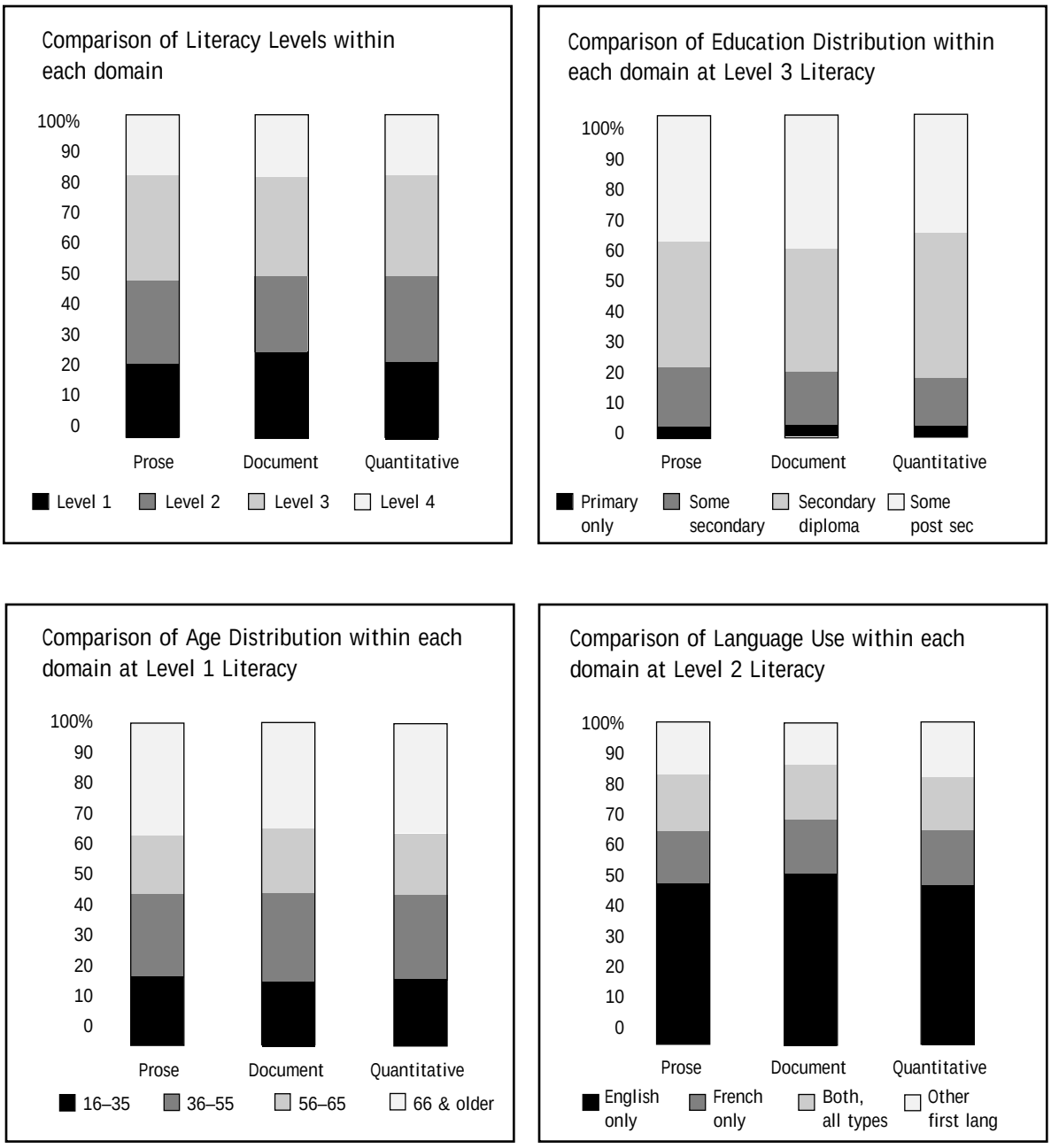
This gap may constrain the quality of literacy advocacy and policy decision-making in Canada's north.

4.2.2 Considerations related to literacy domains

For the purposes of the current project, separate analyses were carried out on data from all three literacy domains. Comparisons among the three domains show that differences among Prose, Document and Quantitative literacy are minor. (See Figure 4.) Thus, when discussing literacy in general many researchers have adopted the convention of referring only to Prose literacy data. We have taken this approach in this report.

This is *not* to say that document and quantitative literacy data have no use. In fact, they should be used when the particular emphasis is on, for example, completion of forms or performing basic calculations. However, when all three are considered at once, the similarities between domains outweigh the differences. Prose literacy stands in for literacy in general, rather than using a fourth value such as the average of the three domains.

Figure 4. Demonstration of Similarity Among Prose, Document and Quantitative Domains



4.3 LIMITATIONS OF THE CURRENT PROJECT'S METHODOLOGY

Our analyses of nationwide demographic patterns in low literacy are based on cross-tabulations of the original IALS data set and Canadian census figures. As such, they reflect all the strengths and limitations of direct-measures in general (3.2.3), and those of IALS and the census specifically.

Strengths

IALS is a carefully designed and controlled large-scale direct measure of literacy. The design of IALS was based on the approach used in the 1992 National Adult Literacy Survey (NALS) in the U.S. Measures used in NALS, in turn, were developed through a "massive research initiative" financed by the U.S. Department of Education. By building on the approach in NALS, IALS capitalized on U.S. investment's in measuring literacy.

In terms of time, expertise and money, investments in IALS have exceeded investments in all other Canadian adult literacy assessments to date by a significant margin. Researchers at Statistics Canada have played leading roles in developing and implementing IALS nationally and internationally. By generally accepted standards, IALS statistics are powerful and predictive enough to hold up as a snapshot of the nation. Given the size of the IALS sample, the sampling errors associated with IALS are relatively small. Consequently IALS enjoys a very high profile and a high degree of credibility.

Limitations

Neither IALS nor our cross-tabulations include samples from Canada's three northern territories, incarcerated populations, people living in institutions, people who are homeless, and the Canadian Armed Forces. While all of these groups combined constitute only a small portion of the total population of Canada, it has been suggested that the first four of these groups may include unusually high proportions of people with low literacy skills. At any rate, neither IALS nor our secondary analysis of IALS sheds light on the unique issues related to literacy facing those populations.

Participation in IALS was voluntary—those who were unwilling to be tested are not part of the sample. Two hypotheses about the effects of this have been suggested. One is that people with very low skills might have been less inclined than others to participate. The other is that very busy people might refuse to participate in the study. In either event, the results of IALS would tend to be affected by the characteristics of those who chose not to participate.

Critics of direct measures of literacy would likely argue that IALS lacks validity—that is, that a person's performance on IALS tasks does not tell us enough about his or her "real", functional literacy skills in "real-life" situations. IALS researchers selected the texts and questions used in the assessment. Tasks were not negotiated with those tested or with a representative sample of Canadians. Thus it can be argued that IALS's test items, questions and results reflect the researchers' own cultural biases and/or their understating of the types of literacy tasks that are most relevant only to the interests of the survey's sponsors (i.e. literacy factors affecting economic performance).

Given its complexity, IALS is not easily explained in sound bites or briefing notes. As a result, misunderstandings and misstatements about IALS data are common.

IALS does not test writing skills and so it sheds little light on the number of Canadians whose writing skills are holding them back. IALS also does not include tests of mother-tongue reading skills for Allophones. Thus IALS confounds literacy issues with English or French as a Second Language issues and may be seen as equating literacy with skills only in English or French.

Given its complexity, IALS is not easily explained in sound bites or briefing notes. As a result, misunderstandings and misstatements about IALS data are common. For example, while Statistics Canada makes it clear that, "…IALS does not challenge the reality that most adults can in fact read" (page 14), newspaper headline writers declare: "Survey finds nearly a quarter of Canadians can barely read".

For example, while Statistics Canada makes it clear that, "…IALS does not challenge the reality that most adults can in fact read" (page 14), newspaper headline writers declare: "Survey finds nearly a quarter of Canadians can barely read".

The provincial demographic profiles developed by this project are "synthetic estimates". As such they reflect both the strengths and limitations of that approach to developing estimates of literacy proficiency.

Some statisticians contend that because of IALS's sample size limitations, provincial estimates produced from IALS are not as

Some statisticians contend that provincial estimates produced from IALS are not as reliable as they should be and may have errors that can't be assessed.

reliable as they should be, and may have errors that can't be assessed. On the other hand, others believe that literacy skills can be predicted relatively well for large, heterogeneous populations by using a small set of background variables readily available from census type information.

Statistics Canada has used IALS data not only to produce provincial estimates but also to produce estimates for local areas within provinces. Those estimates have been widely disseminated and used to "great effect" in some jurisdictions for public awareness and policy and planning purposes.

It is worth noting that Statistics Canada has used IALS data in much the same way as we have, not only to produce provincial estimates, but also to produce estimates for local areas within provinces. Those estimates have been widely disseminated and used to "great effect" in some jurisdictions for public awareness and policy and planning purposes. For example, a report summarizing the accomplishments of a local literacy and economic development project in Ontario indicates that the greatest accomplishment of the project by far was the interest generated as a result of presenting "local statistics" [i.e. synthetic estimates of local literacy rates derived from the IALS data] (Literary Service Planning/Ontario Local Board, 2000).

Aside from minor differences in the modeling strategies used, the provincial demographic estimates developed for this project are similar and are prone to precisely the same kinds of errors as the provincial and local area estimates produced by Statistics Canada. One notable discrepancy between the results of our modeling method and the original IALS data is that in our provincial estimates every province has higher percentages of people at Level 1 with at least some post secondary education than the IALS data shows for Canada altogether. This may be because a second variable for years of schooling was included in our model to estimate the provincial tables. Or this may be because in the Census more people indicate some post secondary education compared to the IALS record of schooling.

In any event, it should be remembered that all provincial and local area estimates based on the IALS survey data are estimates with margins of statistical error.

5. CROSS-TABULATIONS

The Canadian national data set from IALS was arranged in nine cross-tabulation tables. Cross-tabulation tables present two variables at once, showing the results of one variable related to the other. These tables do not present new information per se; instead they offer new perspectives on information that has already been widely disseminated.

Three tables were prepared for each literacy domain (i.e. prose, document and quantitative) to show the relationships between literacy levels and age groups, literacy levels and education levels, and literacy levels and categories of language use. Each national table shows the composition of each specific demographic category broken down by literacy level (for example, the 16-25 age group broken down into Level 1, Level 2, Level 3 and Level 4/5). Each row of the table shows one demographic category, and totals across to equal 100% of that demographic category. These tables are much like previously published presentations of IALS.

Each national table also gives percentages and actual numbers of people in each literacy level (e.g., Level 1, Level 2), broken down by categories within a specific demographic variable (e.g., age 16–25, age 26–34, age 35–45, etc.). Each level is shown in a column, each column totaling down to equal 100% of the group at the literacy level. These data presentations are original to the present project and are included in this chapter. They extend our understanding of the populations most likely to need and/or demand literacy training, by answering questions such as:

These data presentations extend our understanding of the populations most likely to need and/or demand literacy training.

- What portion of the Level 1 group is prime labour force age?
- What portion of the Level 2 group has completed secondary school? What portion has completed only Grade 8?
- What portion of the Level 1 group has neither English nor French as its first language?
- What portion of the Level 1 group may be parents of pre-schoolers?

5.1 FINDINGS FROM CROSS-TABULATIONS

More than half of the Level 1 group (54% or 2.4 million people) is age 56 or older

The most significant results of national data cross-tabulations are displayed and discussed in this chapter. In tables results are always expressed as percentages. In text percentage figures are given, followed by corresponding rough numbers shown in brackets. Emphasis is on the most important trends.

Special attention is given to the results for the two lowest prose literacy levels. Previous analyses show that Canadians in Levels 1 and 2 are the most disadvantaged (Statistics Canada, 1996), and that those in Level 1 are significantly more disadvantaged than those in Level 2.

In total there are approximately 4.5 million adults (age 16 years and over) in the Level 1 (prose) group; 5.5 million in the Level 2 group; 7.2 million in Level 3; and 4 million in Levels 4/5.

5.1.1 Composition of Literacy Levels by Age Groups

Some portions of all age groups score at the lowest two literacy levels. In general, however, literacy is inversely related to age: younger people tend to have higher literacy levels and older people tend to have lower literacy levels.

Table 1 shows that the groups at the lowest two levels (Levels 1 and 2) are quite different from each other in terms of their composition by age.

As shown in the top half of Table 1, the Level 1 group includes approximately 4.5 million people (21% of total population age 16 years and over). The bottom half of the same table shows that less than one-quarter of the Level 1 group (21% or approximately 957,000 people) is between 16 and 35 years of age. This figure is comprised of 8% (or 368,000 people) who are between 16 and 25 years and 13% (or 589,000 people) who are between 26 and 35 years. In comparison, more than half of the Level 1 group (54% or 2.4 million people) is age 56 or older. This is comprised of 19% (or 829,000 people) who are between 56 and 65 years of age, and 35% (or 1.5 million) who are age 66 or older over.

Approximately 24% of the Level 2 group is 56 years of age or older.

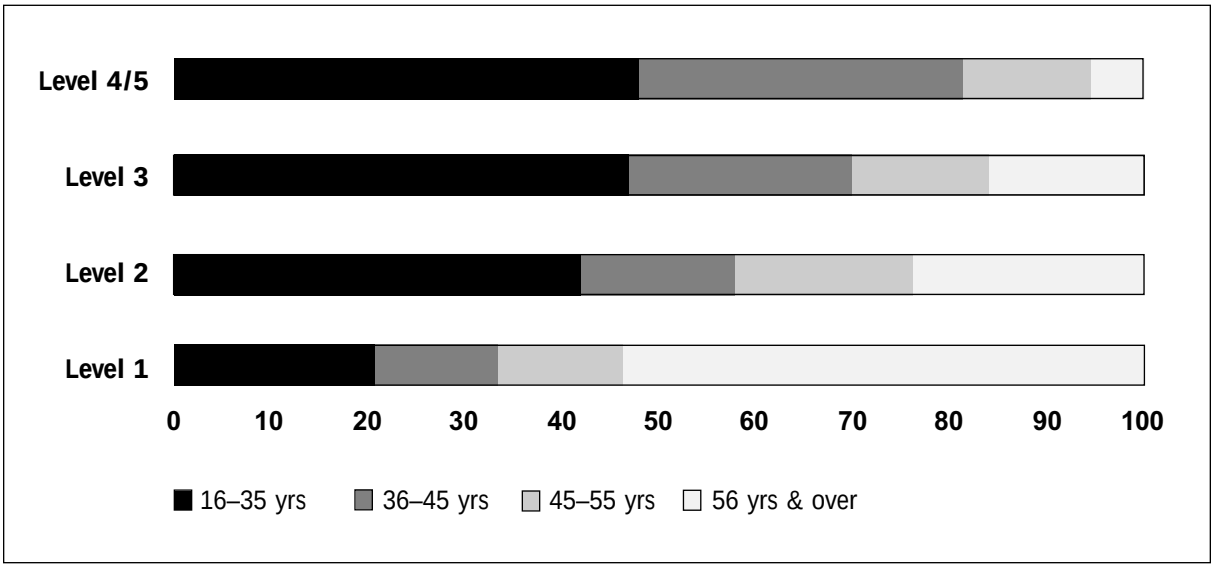
The Level 2 group includes approximately 5.5 million people. More than two-fifths of the Level 2 group (42% or roughly 2.3 million) is between 16 and 35 years of age. This figure is comprised of 17%(or 946,000 people) between 16 and 25 years, and 25% (or nearly 1.4

TABLE 1: PROSE LITERACY BY AGE GROUPS

Age	Level 1	2	3	4/5	Total
	Percentage distribution of literacy levels, for age groups				
16-25	10	26	45	19	100
26-35	12	27	35	26	100
36-45	13	20	37	30	100
46-55	18	33	32	18	100
56-65	39	25	30	7	100
66 & older	54	27	18	2	100
Total	21	26	34	19	100
	Percentage composition of literacy levels, by age				
16-25	8	17	23	17	17
26-35	13	25	24	31	23
36-45	13	16	23	33	21
46-55	13	19	14	14	15
56-65	19	10	9	4	10
66 & older	35	14	7	1	13
Total	100	100	100	100	100

Note: The source of all tabulations in this chapter is Statistics Canada International Adult Literacy Survey, 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000.

Figure 5. Composition Prose Literacy Groups Levels 1 and 2 by Age



million people) between 26 and 35 years. Approximately 24% of the Level 2 group is 56 years of age or older (1.3 million). 14% of these (757,000) are age 66 or older, and 10% (527,000) is between 56 and 65 years of age.

Formal education is the best predictor of literacy by a wide margin.

Thus on prose literacy measures people in the two youngest groups are roughly twice as likely to be found in Level 2 than they are in Level 1, while people in the two oldest groups (56 to 65 years, and 66 and over) are roughly twice as likely to be found in Level 1 than they are in Level 2.

People in the three youngest age groups comprise the large majority of Level 3 and Level 4/5 (prose) groups (70% and 81% respectively), while older Canadians, ages 56 and over, make up only small fractions of those two higher levels (16% and 5% respectively).

Over half (56% or 2.5 million people) of the Level 1 group never attended secondary school at all, having only primary school or less education.

5.1.2 Composition of Literacy Levels by Education Levels

Formal education is the best predictor of literacy by a wide margin. The regression analysis reported in Chapter 6 shows that education level alone accounts for over one-third of the variation in Level 1 (prose) test scores.

Overwhelmingly, Level 1, the lowest level group, is comprised of people with the very lowest levels of education. Table 2 (bottom half) shows that four out of five people (81% or 3.6 million people) at Level 1 have not completed secondary school. Over half (56% or 2.5 million people) of the Level 1 group never attended secondary school at all, having only primary school or less education.

More than three in five in Level 2 have at least a secondary school diploma and more than one in five in Level 2 have some post secondary education.

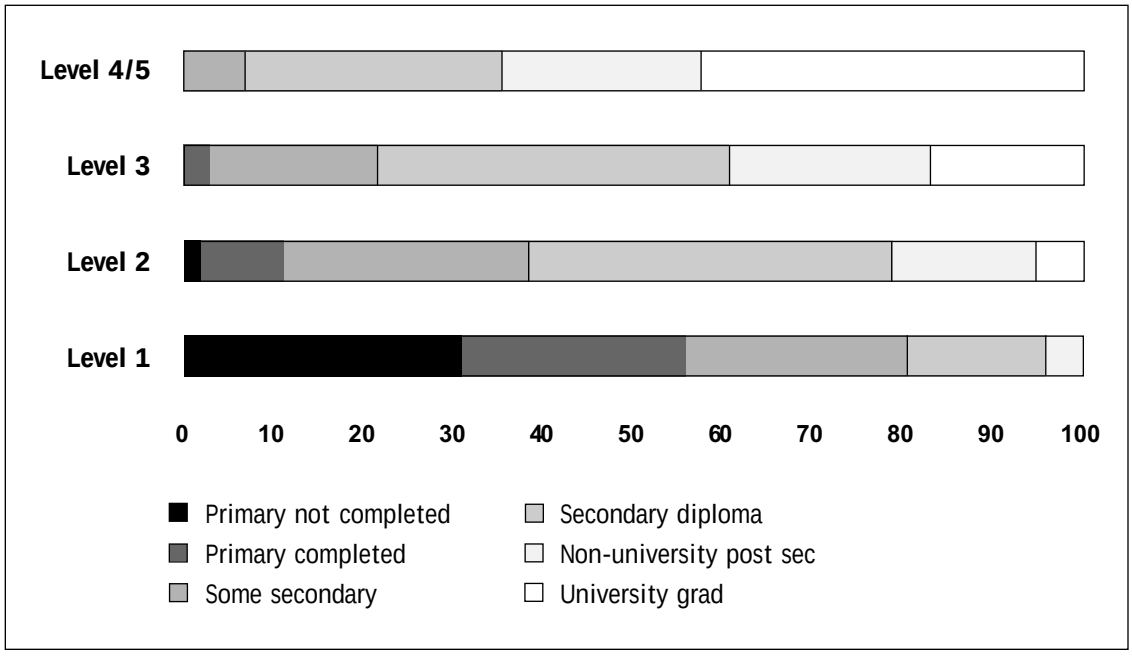
In comparison, the Level 2 (prose) group is made up of people with significantly more education. Only 11% of the Level 2 group (roughly 591,000 people) never attended secondary school. More than three in five in Level 2 (62% or 2.4 million people) have at least a secondary school diploma and more than one in five (1.2 million) in Level 2 have some post secondary education.

Figures for the high end of the literacy skill continuum confirm that education has a strong effect on prose literacy. Ninety-three per cent (93% or 3.8 million people) of the Level 4/5 group has completed secondary school; 2 out of 3 of these have had post-secondary education (see Figure 6).

TABLE 2: PROSE LITERACY BY HIGHEST LEVEL EDUCATION

Education	Level 1	2	3	4/5	Total
	Percentage distribution of literacy, for education levels				
Primary not completed	90	8	2	0	100
Completed primary	61	26	13	1	100
Some secondary	26	36	31	7	100
Completed secondary	10	32	41	18	100
Non-university post-secondary grad.	5	25	44	25	100
University graduate	1	9	38	51	100
Total	21	26	34	19	100
	Percentage composition of literacy levels, by education				
Primary not completed	31	2	0	0	7
Completed primary	25	9	3	0	9
Some secondary	25	28	19	7	20
Completed secondary	15	40	39	29	32
Non-university post-secondary grad.	4	16	22	22	17
University graduate	1	6	17	41	15
Total	100	100	100	100	100

Figure 6. Composition Prose Literacy Groups by Highest Level Educational Attainment



5.1.3 Composition of Literacy Levels by First Language, Official Language, Language Used at Home

IALS was administered in Canada in the respondent's preference of this nation's two official languages. Results are reported in nine categories (see Table 3). Anglophone results are reported in two categories: those for whom English is their first and only official language (53% of all adults age 16 years and over), and those who have English as their first language and also have learned French (6%). Francophone results are reported in three categories: those for whom French is their first and only official language (14%); those who have French as their first language, have learned English, and use French at home (9%); and those who have French as their first language, have learned English, and use English at home (2%). Allophones (those for whom neither English nor French are their first language) are reported in two categories: those who use English or French at home (7%) and those who use their own first language at home (9%).

Canadians who claim both official languages as their mother tongue comprise only 1% of the total population. The results for these bilinguals are reported in two categories: those who use English at home (too small to estimate) and those who use French at home (1%).

It is important to recognize that IALS is a measure of literacy in either English or French, and not always a measure of literacy in a person's language of choice. It is not surprising that those whose first language is neither English nor French ("Allophones") show lower literacy levels than native speakers of either official language.

Anglophones comprise 59% (roughly 12 million people) of the total adult Canadian population (ages 16 years and over). Anglophones are significantly under-represented in the Level 1 (prose) group, constituting only 36% of the Level 1 group (1.5 million people). Approximately 54% of the Level 2 group (2.9 million people) is Anglophone. Anglophones are significantly over-represented in Levels 4/5, constituting about 81% of Level 4/5 group (2.1 million people).

Francophones comprise 25% of the total adult population (roughly 5 million people). Francophones are somewhat over-represented in both the Level 1 and Level 2 (prose) groups, constituting

TABLE 3: PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

First Language, Official Language, Language at Home	Level 1	2	3	4/5	Total
	Percentage distribution of literacy, for language groups				
English (unilingual)	14	25	38	24	100
English, learned French, use English at home	4	18	29	49	100
French (unilingual)	31	29	34	6	100
French, learned English, use French at home	16	24	48	12	100
French, learned English, use English at home	32	24	33	12	100
Both French and English, use English at home	19	45	21	16	100
Both French and English, use French at home	5	63	8	24	100
Allophone, use English or French at home	23	32	34	11	100
Allophone , use neither English nor French at home	61	27	7	5	100
Total	21	26	34	19	100
Percentage composition of literacy levels by first language, official language learned, and language at home					
English (unilingual)	35	50	58	67	53
English, learned French, use English at home	1	4	5	15	6
French (unilingual)	21	16	14	5	14
French, learned English, use French at home	7	9	13	6	9
French, learned English, use English at home	3	2	2	1	2
Both French and English, use English at home	0	1	0	0	0
Both French and English, use French at home	0	2	0	1	1
Allophone, use English or French at home	8	9	7	4	7
Allophone, use neither English nor French at home	25	9	2	2	9
Total	100	100	100	100	100

approximately 31% and 29% of those groups respectively (1.3 million people and 1.5 million people). In contrast Francophones appear to be significantly under-represented at the highest literacy levels, comprising only 12% of the Level 4/5 group (about 465,000 people).

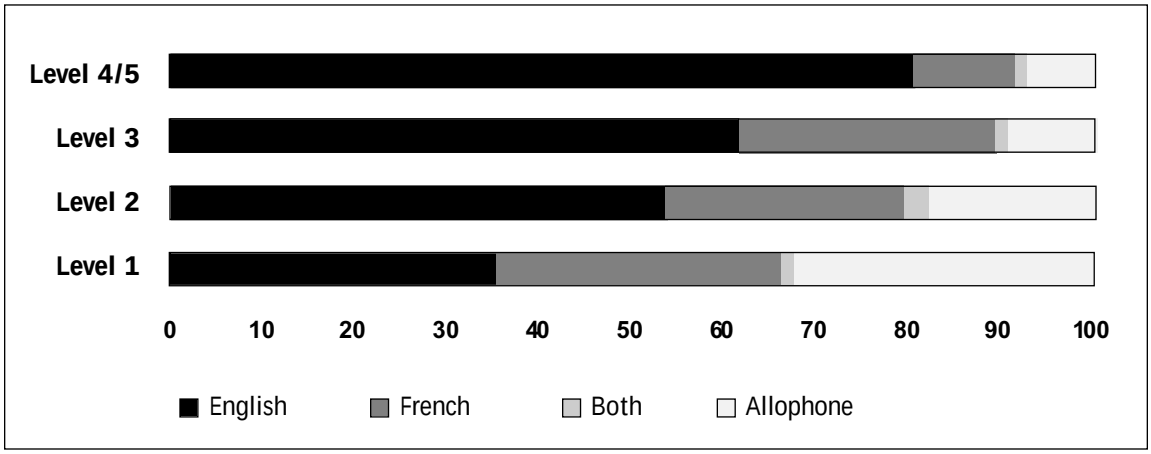
This suggests Francophones are more likely than Anglophones to have low literacy levels. Within the two lowest levels, Francophones are slightly more likely to be found at Level 1 while Anglophones are much more likely to be found in Level 2. The regression analysis reported in Chapter 6 suggests that the apparent difference between Francophones and Anglophones is largely a matter of age and education—an effect that is diminishing in recent generations.

Allophones comprise about 16% (roughly 3.3 million) of the total Canadian adult population. They are significantly over-represented at

the very lowest prose literacy level. Approximately 33% of Level 1 group (about 1.4 million people) are Allophone. Allophones are nearly proportionately represented in Level 2 (18% of Level 2 or about 962,000 people). They are significantly under-represented at Level 4/5, accounting for only 6% of that group (230,000 people). Allophones who don't use English or French at home are twice as likely to be at Level 1 as Allophones who use English or French at home.

While the numbers are very small (and therefore subject to higher margins of error), Anglophones' knowledge of French appears to be more highly correlated to higher literacy levels than Francophones' knowledge of English. In other words, bilingual Anglophones have higher levels of literacy than bilingual Francophones.

Figure 7. Composition of Prose Literacy Groups by First Language



Summary of National Cross-tabulations

5.2 Summary of National Cross-tabulations

Cross-tabulations of IALS national level data reflect significant demographic differences between the two groups at lowest prose literacy levels (IALS Level 1 and Level 2). Canadian adults at the two lowest literacy levels generally fit the following demographic profiles.

THE LEVEL 1 GROUP IS COMPRISED OF...

... significantly more older adults than all other levels *Over half of Level 1, 54%, is age 56 or over. This figure represents 2.4 million adult Canadians.*

... people with much less formal education than those at other levels. *80% of Level 1 (roughly 3.6 million adult Canadians) is comprised of adults without a secondary diploma, 55% without any schooling after the primary level.*

... in absolute numbers, an almost even mix of Anglophones, Francophones and Allophones.

... a much higher proportion of Allophones than all other levels. *One-third of all adults in Level 1 do not have English or French as their first language. That's roughly 1.4 million people.*

THE LEVEL 2 GROUP IS COMPRISED OF...

... a mix of people demographically similar to the Canadian adult population at large.

... people at various ages, roughly in the same proportion as their numbers in the population at large. *Just under one quarter, 24%, are age 56 or older. That's nearly 1.3 million people. More than two in five, 42%, of the Level 2 group are between the ages of 16 and 35.*

... Anglophones, Francophones and Allophones in proportions roughly similar to their numbers in the population at large. *English-only speakers comprise 50% of the Level 2 group. Those with French as their first language comprise 27% - 29% of the Level 2 group. 18% of the Level 2 group, about 962,000 people, has some other (non-official language) first language.*

... people with a variety of levels of education. *More than three in five, 62%, at Level 2 have at least completed secondary education. That's about 3.3 million people. More than one in five, or 22%, at this level have some post-secondary education.*

6. Probit Regression Analyses of Canadian IALS data

Older Canadians are not just less literate; in general they are also less educated. This observation demonstrates the main problem with the cross-tabulations described in the previous chapter. Cross-tabulations examine the effects of only one variable on literacy at a time. But the effect of age on literacy (over half of the Level 1 group is 56 years of age and over) is also seen in the effect of education on literacy (where over half of those in Level 1 have primary school or less education). Many though not all of the older people in the Level 1 group are also the less-educated people in the Level 1 group. And some of these are also the same people whose first language is neither English nor French.

In order to estimate demographic profiles for literacy level groups in each province a "predictor model" is needed. That model must be based on national data that can account for the effects of two or more variables at the same time. Technically speaking, the way to account for two or more variables at the same time is to use "regression analysis", a statistical method which makes it possible to estimate the effect of any one variable (e.g., age) while other variables are held constant (e.g., language, education and gender). A particular type of regression, called "probit" regression, is used when the prediction required is binary (i.e., either a person is at Level 1 or s/he is not).[1]

Regressions are difficult to understand without some statistical training and they really can't be explained without resorting to complex statistical language. Although I've worked with statistics throughout my career, my formal training in statistics has been minimal, and probit analyses are still beyond my confident grasp. Thus for this part of the project I relied entirely on expert statisticians.

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1 Probit analysis is used instead of logistic regression (a common procedure for binary variables) because it makes sense to assume that literacy is normally distributed within the population. Actually, logistic regression gives very similar results.

Dr. Ornstein designed and carried out these analyses, and Paul Moore, a Ph.D. candidate at the Institute for Social Research, prepared a first draft of this and the provincial analyses shown in Chapter 7. Two statisticians on the advisory committee for this project, Dr. David Foot and Mr. Jean Pignal, reviewed and provided feedback on the statistical design and analysis.

Key findings from the regression analyses are briefly summarized in Sections 6.1 and 6.2 below. Detailed results of the regression analysis are contained and discussed in Appendix 1. These are most likely to be of interest to statisticians.

The following variables were included in a full regression model carried out for the purposes of this project: gender, age, language, years of education, and place of higher education or place of birth for lower education. Separate probit regressions were calculated for literacy Level 1 and literacy Level 2, for each literacy domain (prose, document and quantitative).

6.1 PROBIT REGRESSION RESULTS FOR LEVEL 1 PROSE LITERACY

In the most general terms, much of the predictive power of the probit regression for Level 1 (Prose) comes from the variables for education. This is true for all three domains of literacy: prose, document and quantitative.

Six levels of highest educational achievement (i.e. primary not completed, completed primary, some secondary, completed secondary, non-university post-secondary graduate, and university graduate) show a strong and significant trend. Less formal education makes it far more likely for a person to be in the Level 1 group. Compared to holding a secondary school diploma, all of the education levels are significantly different, except having some post secondary schooling.

Within the six categories of educational attainment, years of schooling also has a significant effect in the same direction. Each additional year of education makes a person somewhat less likely to be in Level 1.

With gender, education and language held constant, only people in the oldest age group (66 years and over) are still much more likely to be at Level 1 compared to the reference category of persons between 36 and 45 years of age.

When taken alone, gender does not appear to be important in predicting who is in Level 1, but with education, age and language held constant, women are less likely to be in the Level 1 group than men. Nevertheless, the difference between men and women is still small.

Finally, none of the categories of first language and language spoken at home is significantly different from "English" when all the other variables are added to the regression. Allophones whose at-home language is neither English nor French are more likely to be in Level 1, and this finding is *almost* statistically significant. This variable is significant, and much stronger before the variables for place of post-secondary education (or place of birth for less education) are added.

Looking at the effects of place of education or birth, there are two international regions and two provinces that deviate significantly from the reference of Ontario. Those born/educated in Latin American, the USA, Asia and other countries (Africa, Middle East) are each much more likely to be in the Level 1 group. Those born/educated on Prince Edward Island (PEI) are significantly more likely to be in the Level 1 group, while those born/educated in Saskatchewan are significantly less likely to be in this group.

6.2 PROBIT REGRESSION RESULTS FOR LEVEL 2 PROSE LITERACY

The probit regression on Level 2 literacy is independent of that for Level 1.[2] And yet, the coefficients for predicting Level 2 are similar in strength and significance to those for Level 1. The same trend predicting who is likely to be in the Level 1 group also predicts who is likely to be in the Level 2 group.

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2 Dependent variable was "In Level 2" as opposed to "In Levels 3, 4 or 5." The regression is orthogonal to the previous where the dependent variable was "In Level 1" as opposed to "In Levels 2, 3, 4 or 5."

The similarity of the regressions shows that these two groups are different only in degree. The exceptions are for the provinces that had significantly different results in the regression on Level 1. The results for the regression on Level 2 shows very little difference among provinces, with New Brunswick only somewhat more likely to have people in Level 2 than the reference of Ontario.

In summary, probit regression analyses of IALS national data show that the demographic variables that produce differences in literacy levels are: age, level of education, years of education, gender and language use. Among these variables, two clearly show the strongest effect: education and age 66 or older.

7. Provincial Estimates of Prose Literacy Demographics: Methodology and Findings

The third and final step in this part of the project was to develop synthetic estimates of the demographic profiles of low literacy for each Canadian province. For reasons stated earlier in this report, we were unable to develop comparable estimates for Canada's three northern territories.

Probit regression analyses were used to calculate a "national predictor model" for literacy Levels 1 and 2. The predictor model was then "mapped" onto provincial data from the 1996 Census, to produce estimates of the composition of each literacy level in each province.

Probit regression analyses were used to calculate a "national predictor model" for literacy Levels 1 and 2 (Chapter 6). The predictor model was then "mapped" onto provincial data from the 1996 Census, to produce estimates of the composition of each literacy level in each province. Chapter 3 (3.2.4) looks at the strengths and limitations of this type of statistical modeling.

In the present chapter provincial data from the estimates is displayed in tables and charts.[1] This chapter does not, however, discuss trends within provinces or the apparent differences between them. Discussions of trends within provinces are better left to those who know more about provincial populations and those whose mandate is to influence and/or determine provincial policies. Differences between provinces are the result of differences in population demographics and the weighting of demographic variables used in the predictor model.

It is important to note that in estimates based on IALS, provinces with larger populations contribute more weight to the national percentages, and will resemble the Canadian national figures more closely. Less populous provinces and smaller categories will have larger margins of error. Therefore, comparisons of small differences between or within provinces are not significant. Keep this in mind, especially when looking at Francophones in Quebec and Allophones in Ontario, compared to all Canada.

1 The source of all tabulations in this chapter is Statistics Canada International Adult Literacy Survey, 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000.

7.1 NEWFOUNDLAND AND LABRADOR PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.1.1 Age

TABLE 4: NEWFOUNDLAND AND LABRADOR—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	6	28	37	30	100
26-35	13	25	29	33	100
36-45	17	23	30	29	100
46-55	22	32	23	22	100
56-65	33	30	27	10	100
over 65	69	21	10	1	100
Total	23	26	27	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	5	22	27	25	20
26-35	11	18	20	27	19
36-45	17	20	25	28	22
46-55	15	19	13	14	15
56-65	15	12	10	5	11
over 65	36	9	4	0	12
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	5	24	32	26	87
26-35	11	20	24	28	83
36-45	17	22	29	28	96
46-55	15	21	15	15	69
56-65	15	13	12	5	45
over 65	35	10	5	0	50
Total	97	112	117	101	427

7.1.2 EDUCATION

Roughly 57% of the Level 1 group in this province reported eight years or less of schooling.

TABLE 5: NEWFOUNDLAND AND LABRADOR—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION LEVELS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	43	27	21	9	100
Secondary Graduate	9	30	36	25	100
Non-university post-secondary graduate	8	28	33	31	100
University Graduate	1	6	23	71	100
Total	23	26	27	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	82	45	33	17	43
Secondary Graduate	8	22	24	20	19
Non-university post-secondary graduate	10	31	35	39	29
University Graduate	0	2	7	25	8
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	79	50	39	17	186
Secondary Graduate	7	24	28	20	80
Non-university post-secondary graduate	10	35	41	39	126
University Graduate	0	2	8	25	36
Total	97	112	117	101	427

7.1.3 Language Use

Newfoundland is demographically the most different from any other province because it has the most homogeneous language use. There are practically no people with low literacy who speak French only. Nearly all Newfoundlanders with low literacy speak only English.

TABLE 6: NEWFOUNDLAND AND LABRADOR—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English (unilingual)	23	26	28	23	100
English, learned French, Eng at home	5	21	20	54	100
French (unilingual)	68	19	14	0	100
French, learned English, Fr at home	18	30	37	15	100
French, learned English, Eng at home	27	27	29	18	100
Allophone, Eng or Fr at home	10	29	35	25	100
Allophone, neither Eng nor Fr at home	41	32	11	16	100
Total	23	26	27	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English (unilingual)	98	96	96	92	95
English, learned French, Eng at home	1	2	2	7	3
French (unilingual)	0	0	0	0	0
French, learned English, Fr at home	0	0	0	0	0
French, learned English, Eng at home	0	0	0	0	0
Allophone, Eng or Fr at home	0	1	1	1	1
Allophone, neither Eng nor Fr at home	1	1	0	0	0
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE AND LITERACY LEVELS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English (unilingual)	95	107	113	93	408
English, learned French, Eng at home	1	3	3	7	13
French (unilingual)	0	0	0	0	0
French, learned English, Fr at home	0	0	0	0	1
French, learned English, Eng at home	0	0	0	0	1
Allophone, Eng or Fr at Home	0	1	1	1	3
Allophone, neither Eng nor Fr at Home	1	1	0	0	2
Total	97	112	117	101	427

7.2 PRINCE EDWARD ISLAND (PEI) PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.2.1 Age

Prince Edward Island is the only province where less than half of the Level 1 group are 56 years of age or older. This may be a matter of statistical error because it is the smallest province, but this is clearly a matter for further investigation.

TABLE 7: PRINCE EDWARD ISLAND—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	14	29	46	11	100
26-35	21	24	39	16	100
36-45	24	22	40	15	100
46-55	30	28	30	13	100
56-65	38	26	31	5	100
over 65	71	19	10	0	100
Total	31	25	34	11	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	8	22	25	18	18
26-35	15	21	25	32	21
36-45	14	16	22	25	19
46-55	15	17	13	18	15
56-65	15	13	11	6	12
over 65	33	11	4	1	15
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	3	5	8	2	19
26-35	5	5	8	3	22
36-45	5	4	8	3	19
46-55	5	4	5	2	16
56-65	5	3	4	1	12
over 65	10	3	2	0	15
Total	32	25	34	11	102

7.2.2 Education

Roughly 36% of the Level 1 group in PEI had eight years or less of schooling.

TABLE 8: PRINCE EDWARD ISLAND — PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	55	22	20	2	100
Secondary Graduate	16	32	42	10	100
Non-university post-secondary grad	19	29	41	11	100
University Graduate	2	7	48	43	100
Total	31	25	34	11	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	70	36	23	9	39
Secondary Graduate	11	26	25	18	20
Non-university post-secondary grad	19	35	36	30	30
University Graduate	1	3	15	43	11
Total	100	100	100	100	100

ESTIMATED COUNTS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	22	9	8	1	40
Secondary Graduate	3	7	9	2	21
Non-university post-secondary grad	6	9	12	3	30
University Graduate	0	1	5	5	11
Total	32	25	34	11	102

7.2.3. Language Use

Francophones comprise roughly 5% of PEI's total adult population; Allophones make up around 2%.

TABLE 9: PRINCE EDWARD ISLAND—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English, (unilingual)	31	25	34	10	100
English, learned French, Eng at home	14	23	3	31	100
French, (unilingual)	93	6	1	0	100
French, learned English, Fr at home	45	22	29	4	100
French, learned English, Eng at home	50	20	24	6	100
Allophone, Eng or Fr at home	26	29	32	13	100
Allophone, neither Eng nor Fr at home	37	44	10	8	100
Total	31	25	34	11	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English, (unilingual)	88	88	89	79	87
English, learned French, Eng at home	3	6	6	17	6
French, (unilingual)	0	0	0	0	0
French, learned English, Fr at home	4	2	2	1	3
French, learned English, Eng at home	3	2	1	1	2
Allophone, Eng or Fr at home	1	1	1	1	1
Allophone, neither Eng nor Fr at home	1	1	0	0	1
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE AND LITERACY LEVELS, IN THOUSANDS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English (unilingual)	28	22	31	9	89
English, learned French, Eng at home	1	1	2	2	6
French, (unilingual)	0	0	0	0	0
French, learned English, Fr at home	1	1	1	0	3
French, learned English, Eng at home		0	0	0	2
Allophone, Eng or Fr at Home	0	0	0	0	1
Allophone, neither Eng nor Fr at Home	0	0	0	0	1
Total	32	25	34	11	102

7.3 NOVA SCOTIA PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.3.1 Age

TABLE 10: NOVA SCOTIA—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	7	28	52	13	100
26-35	10	24	46	20	100
36-45	11	22	48	19	100
46-55	16	31	37	15	100
56-65	24	30	39	6	100
over 65	53	28	18	1	100
Total	18	27	41	14	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	6	18	22	17	17
26-35	10	18	22	29	20
36-45	13	17	25	30	21
46-55	15	19	15	18	16
56-65	14	12	10	5	11
over 65	41	15	6	1	14
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	8	35	63	16	122
26-35	14	33	64	28	138
36-45	17	33	72	29	151
46-55	19	36	43	18	116
56-65	19	23	30	5	77
over 65	53	29	18	1	101
Total	130	188	290	96	704

7.3.2 Education

Roughly 44% of the Level 1 group in Nova Scotia had eight years or less of schooling.

TABLE 11: NOVA SCOTIA—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	38	29	29	3	100
Secondary Graduate	8	31	49	12	100
Non-university post-secondary grad	8	29	49	14	100
University Graduate	1	7	47	45	100
Total	18	27	41	14	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	78	41	26	9	37
Secondary Graduate	8	23	23	17	19
Non-university post-secondary grad	14	33	36	32	31
University Graduate	1	3	14	42	13
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	101	77	76	9	263
Secondary Graduate	10	43	67	16	137
Non-university post-secondary grad	18	62	105	31	216
University Graduate	1	6	42	40	89
Total	130	188	290	96	704

7.3.3 Language Use

Of the Atlantic provinces, Nova Scotia has the highest numbers of Allophones.

TABLE 12: NOVA SCOTIA—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English, (unilingual)	18	27	43	13	100
English, learned French, Eng at home	6	21	36	38	100
French, (unilingual)	52	21	23	4	100
French, learned English, Fr at home	34	27	34	5	100
French, learned English, Eng at home	29	27	35	8	100
Allophone, Eng or Fr at Home	17	29	37	17	100
Allophone, neither Eng nor Fr at Home	39	38	12	12	100
Total	18	27	41	14	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English, (unilingual)	86	88	90	80	87
English, learned French, Eng at home	2	4	5	14	5
French, (unilingual)	0	0	0	0	0
French, learned English, Fr at home	4	2	2	1	2
French, learned English, Eng at home	3	2	2	1	2
Allophone, Eng or Fr at Home	1	2	1	2	2
Allophone, neither Eng nor Fr at Home	3	2	0	1	1
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE AND LITERACY LEVELS, IN THOUSANDS

	Level				
Languages	**1**	**2**	**3**	**4/5**	**Total**
English, (unilingual)	111	164	261	77	614
English, learned French, Eng at home	2	8	13	14	37
French, (unilingual)	1	0	0	0	1
French, learned English, Fr at home	5	4	5	1	16
French, learned English, Eng at home	4	4	5	1	15
Allophone, Eng or Fr at Home	2	3	4	2	11
Allophone, neither Eng nor Fr at Home	4	4	1	1	10
Total	130	188	290	96	704

7.4 New Brunswick Prose Literacy and Demographic Estimates

7.4.1 Age

New Brunswick's demographics according to age groups and education levels for both Level 1 and Level 2 are nearly identical to the national figures. An exception is the lower percentage of very young people in Level 1.

TABLE 13: NEW BRUNSWICK—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	7	30	41	22	100
26-35	12	26	35	28	100
36-45	15	24	36	25	100
46-55	23	31	26	20	100
56-65	33	29	29	9	100
over 65	64	23	13	1	100
Total	23	27	31	19	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	5	20	24	21	18
26-35	11	20	23	30	21
36-45	14	18	24	27	21
46-55	16	18	13	16	16
56-65	15	12	10	5	11
over 65	39	12	6	1	14
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	7	31	42	23	103
26-35	14	30	41	33	118
36-45	18	28	42	29	118
46-55	20	28	24	18	90
56-65	20	18	18	6	61
over 65	51	18	10	1	81
Total	131	154	177	110	571

7.4.2 Education

59% of the Level 1 group in New Brunswick have 8 years or less of schooling.

TABLE 14: NEW BRUNSWICK—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level	Level				
of Schooling	1	2	3	4/5	Total
Not secondary graduate	47	26	21	6	100
Secondary graduate	8	33	39	20	100
Non-university post-secondary graduate	10	30	37	23	100
University graduate	1	7	35	57	100
Total	23	27	31	19	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level	Level				
of Schooling	1	2	3	4/5	Total
Not secondary graduate	80	38	26	13	39
Secondary graduate	8	29	30	24	23
Non-university post-secondary graduate	12	30	32	32	27
University graduate	0	3	12	31	11
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level	Level				
of Schooling	1	2	3	4/5	Total
Not secondary graduate	105	59	46	14	224
Secondary graduate	10	44	52	27	133
Non-university post-secondary graduate	15	47	57	35	154
University graduate	0	4	21	34	61
Total	131	154	177	110	571

7.4.3 Language Use

New Brunswick's unique mix of French and English makes its composition along language lines distinct from any other province.

TABLE 15: NEW BRUNSWICK—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	18	27	43	13	100
English, learned French, Eng at home	8	23	24	45	100
French (unilingual)	54	22	21	3	100
French, learned English, Fr at home	25	29	35	11	100
French, learned English, Eng at home	30	27	30	13	100
Allophone, Eng or Fr at home	19	31	33	16	100
Allophone, neither Eng nor Fr at home	40	36	10	13	100
Total	23	27	31	19	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	46	56	58	63	56
English, learned French, Eng at home	3	7	6	20	8
French (unilingual)	19	7	5	1	8
French, learned English, Fr at home	24	24	25	12	22
French, learned English, Eng at home	5	4	4	3	4
Allophone, Eng/Fr at Home	1	1	1	1	1
Allophone, neither Eng/Fr at Home	1	1	0	1	1
Total	100	100	100.	100	100

PERCENTAGE COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE AND LITERACY LEVELS, IN THOUSANDS

Languages	1	2	3	4/5	Total
English (unilingual)	61	86	102	69	317
English, learned French, Eng at home	4	11	11	22	48
French (unilingual)	25	10	10	1	47
French, learned English, Fr at home	31	37	44	14	126
French, learned English, Eng at home	7	6	7	3	23
Allophone, Eng and Fr at Home	1	2	2	1	6
Allophone, neither Eng nor Fr at Home	2	2	0	1	5
Total	131	154	177	110	571

7.5 QUEBEC PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.5.1 Age

Age and education are very similar to national charts, in part because Quebec is one-quarter of the nation and contributes heavily to Canadian numbers.

TABLE 16: QUEBEC—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	8	32	48	13	100
26-35	10	26	43	21	100
36-45	13	25	44	18	100
46-55	19	34	34	13	100
56-65	31	32	31	6	100
over 65	61	25	13	1	100
Total	21	29	37	13	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	6	19	22	16	17
26-35	10	19	24	32	21
36-45	13	19	26	29	22
46-55	16	21	15	17	17
56-65	17	12	9	5	11
over 65	37	11	4	1	12
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	71	298	443	118	930
26-35	117	301	485	237	1,140
36-45	153	299	531	210	1,193
46-55	182	321	318	127	949
56-65	193	197	191	37	618
over 65	422	173	87	6	688
Total	1,138	1,589	2,055	735	5,518

7.5.2 Education

Roughly 64% of the Level 1 group in Quebec had eight years or less of schooling.

TABLE 17: QUEBEC—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	48	29	21	2	100
Secondary graduate	9	36	45	10	100
Non-university post-secondary graduate	7	30	47	16	100
University graduate	1	9	44	46	100
Total	21	29	37	13	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	79	34	19	6	34
Secondary graduate	12	33	32	18	26
Non-university post-secondary grad	9	29	34	32	27
University graduate	1	4	14	43	12
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	897	543	400	46	1,886
Secondary graduate	133	531	657	137	1,457
Non-university post-secondary graduate	102	456	701	238	1,497
University graduate	6	59	298	314	677
Total	1,138	1,589	2,055	735	5,518

7.5.3 Language Use

Quebec, of course, has by far the highest percentage of French only and the lowest percentage of English only speakers. The Canadian trend where Level 1 contains more Francophones than Level 2 is duplicated within Quebec. Quebec's bilingual speakers are much less likely to be at Level 1 literacy than Level 2. The number of "other" language speakers (i.e. Allophones) is relatively low in Quebec, lower than any province to the West of it.

TABLE 18: QUEBEC—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	22	28	34	16	100
English, learned French, Eng at home	8	21	25	46	100
French, (unilingual)	26	30	37	7	100
French, learned English, Fr at home	9	27	46	18	100
French, learned English, Eng at home	15	29	38	19	100
Allophone, Eng or Fr at home	18	30	35	17	100
Allophone, neither Eng nor Fr at Home	53	30	9	8	100
Total	21	29	37	13	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	3	3	3	4	3
English, learned French, Eng at home	2	4	4	19	6
French, (unilingual)	60	51	49	25	49
French, learned English, Fr at home	13	30	39	42	31
French, learned English, Eng at home	1	1	1	1	1
Allophone, Eng or Fr at Home	3	4	3	5	4
Allophone, neither Eng nor Fr at Home	17	7	2	4	7
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE AND LITERACY LEVELS, IN THOUSANDS

Languages	1	2	3	4/5	Total
English, (unilingual)	38	47	58	28	170
English, learned French, Eng at home	24	66	77	142	309
French, (unilingual)	687	815	1,006	181	2,688
French, learned English, Fr at home	151	475	793	309	1,727
French, learned English, Eng at home	7	14	19	10	50
Allophone, Eng or Fr at home	37	60	71	35	202
Allophone, neither Eng nor Fr at home	195	112	33	30	371
Total	1,138	1,589	2,055	735	5,518

7.6 ONTARIO PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

Ontario is Canada's most populous province. At one-third the population of Canada, inevitably Ontario figures create one-third of the national averages.

7.6.1 Age

In terms of age, there is almost no difference between Ontario and the national charts.

TABLE 19: ONTARIO—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS BY AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	9	29	43	20	100
26-35	12	24	36	27	100
36-45	14	22	37	27	100
46-55	19	30	30	21	100
56-65	29	28	33	10	100
over 65	54	26	18	2	100
Total	21	26	34	20	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	7	19	22	18	17
26-35	12	19	22	29	21
36-45	14	17	23	29	21
46-55	15	19	15	18	16
56-65	15	12	11	6	11
over 65	37	14	8	1	14
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	122	405	602	284	1,413
26-35	212	419	618	467	1,716
36-45	237	373	642	464	1,716
46-55	253	403	405	290	1,351
56-65	261	253	305	94	913
over 65	626	297	209	20	1,151
Total	1,710	2,151	2,780	1,619	8,260

7.6.1 Education

Roughly 44% of the Level 1 group in Ontario had eight years or less of schooling.

TABLE 20: ONTARIO—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	45	26	24	6	100
Secondary graduate	11	33	40	16	100
Non-university post-secondary graduate	12	29	39	21	100
University graduate	2	11	34	53	100
Total	21	26	34	20	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	69	31	22	9	32
Secondary graduate	14	33	31	21	26
Non-university post-secondary grad	16	30	31	29	27
University graduate	1	7	15	41	15
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	1,179	668	621	149	2,618
Secondary graduate	238	700	865	345	2,150
Non-university post-secondary graduate	270	642	868	463	2,242
University graduate	23	140	426	661	1,250
Total	1,710	2,151	2,780	1,619	8,260

7.6.2 Language Use

Both Levels 1 and 2 in Ontario include many people with neither English nor French as first language. Note, however, that some Western provinces have higher percentages of "other" first language speakers in Levels 1 and 2.

TABLE 21: ONTARIO—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	15	25	39	21	100
English, learned French, Eng at home	6	18	27	49	100
French (unilingual)	49	25	24	3	100
French, learned English, Fr at home	20	28	42	11	100
French, learned English, Eng at home	24	28	36	13	100
Allophone, Eng or Fr at home	18	30	37	15	100
Allophone, neither Eng nor Fr at home	51	32	8	8	100
Total	21	26	34	20	100

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	15	25	39	21	100
English, learned French, Eng at home	47	61	75	69	64
English, learned French	2	4	4	14	5
French (unilingual)	1	0	0	0	0
French, learned English, Fr at home	2	3	3	1	2
French, learned English, Eng at home	2	2	2	1	2
Allophone, Eng or Fr at home	9	12	11	8	10
Allophone, neither Eng nor Fr at home	37	19	4	6	15
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE AND LITERACY LEVELS, IN THOUSANDS

Languages	1	2	3	4/5	Total
English (unilingual)	809	1,308	2,088	1,121	5,326
English, learned French, Eng at home	26	80	123	221	450
French (unilingual)	12	6	6	1	25
French, learned English, Fr at home	41	57	86	22	206
French, learned English, Eng at home	41	48	62	22	172
Allophone, Eng and Fr at home	149	254	312	128	843
Allophone, neither Eng nor Fr at home	631	398	104	104	1,237
Total	1,710	2,151	2,780	1,619	8,260

7.7 MANITOBA PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.7.1 Age

TABLE 22: MANITOBA—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	6	32	41	21	100
26-35	9	27	35	28	100
36-45	10	24	38	28	100
46-55	14	33	30	23	100
56-65	22	33	35	10	100
over 65	51	31	17	1	100
Total	18	30	33	20	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	6	20	23	19	18
26-35	11	18	21	28	20
36-45	12	17	23	29	20
46-55	12	17	14	17	15
56-65	13	12	11	6	11
over 65	46	17	8	1	16
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	10	49	62	32	152
26-35	16	45	58	47	166
36-45	17	41	64	48	170
46-55	18	42	38	29	127
56-65	20	30	31	9	90
over 65	68	42	22	2	134
Total	148	248	276	166	838

7.7.2 Education

Roughly 54% of the Level 1 group in Manitoba had eight years or less of schooling.

TABLE 23: MANITOBA—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	35	32	26	8	100
Secondary graduate	7	34	39	20	100
Non-university post-secondary graduate	8	32	38	22	100
University graduate	1	9	34	56	100
Total	18	30	33	20	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary Grad	79	44	32	15	41
Secondary Graduate	8	24	25	21	21
Non-university post-secondary graduate	12	29	31	30	27
University Graduate	1	4	12	34	12
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary grad	118	108	88	26	339
Secondary graduate	12	60	69	34	176
Non-university post-secondary graduate	17	71	86	50	224
University graduate	1	9	33	56	99
Total	148	248	276	166	838

7.7.3 Language Use

Manitoba has a larger than expected percentage of people with Level 1 literacy whose first language is neither English nor French. Further investigation could focus on knowing if these people are Native-Canadians, "New" Canadians or elderly Eastern European immigrants.

TABLE 24: MANITOBA—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	11	29	38	23	100
English, learned French, Eng at home	4	23	27	46	100
French, (unilingual)	55	27	17	1	100
French, learned English, Fr at home	25	32	35	9	100
French, learned English, Eng at home	21	32	35	13	100
Allophone, Eng/Fr at Home	25	34	31	10	100
Allophone, neither Eng/Fr at Home	55	31	7	6	100
Total	18	30	33	20	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	40	64	76	78	67
English, learned French, Eng at home	1	3	3	9	4
French, (unilingual)	0	0	0	0	0
French, learned English, Fr at home	3	2	2	1	2
French, learned English, Eng at home	3	3	3	2	3
Allophone, Eng/Fr at home	20	16	13	7	14
Allophone, neither Eng/Fr at home	32	11	2	3	10
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE USE, IN THOUSANDS

Languages	1	2	3	4/5	Total
English, (unilingual)	60	159	210	129	558
English, learned French, Eng at home	1	8	9	15	33
French, (unilingual)	0	0	0	0	1
French, learned English, Fr at home	4	5	6	1	16
French, learned English, Eng at home	5	8	8	3	24
Allophone, Eng or Fr at home	30	41	36	12	119
Allophone, neither Eng nor Fr at home	48	27	6	5	87
Total	148	248	276	166	838

7.8 SASKATCHEWAN PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.8.1 Age

Saskatchewan has the highest percentages of people over 56 years old at Level 1. This is perhaps reflective of an elderly population in general.

TABLE 25: SASKATCHEWAN—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	4	31	43	22	100
26-35	7	26	37	30	100
36-45	7	24	39	30	100
46-55	11	33	32	24	100
56-65	19	35	36	10	100
over 65	49	33	17	1	100
Total	16	30	34	21	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	5	19	23	19	18
26-35	8	17	20	28	19
36-45	9	17	24	30	21
46-55	10	16	13	17	14
56-65	13	13	11	5	11
over 65	54	19	8	1	17
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	6	41	58	29	134
26-35	9	36	50	41	137
36-45	11	36	59	45	151
46-55	11	34	33	25	102
56-65	15	27	28	8	79
over 65	62	41	21	1	125
Total	113	216	248	150	728

7.8.2 Education

Saskatchewan has relatively low levels of people with secondary diplomas at Level 1 (but not Level 2). Roughly 60% of the Level 1 group in Saskatchewan had eight years or less of schooling.

TABLE 26: SASKATCHEWAN—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	32	33	27	8	100
Secondary graduate	4	33	41	21	100
Non-university post-secondary graduate	6	30	39	25	100
University graduate	1	8	34	58	100
Total	16	30	34	21	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	32	33	27	8	100
Not secondary graduate	84	46	33	17	41
Secondary graduate	6	23	25	22	21
Non-university post-secondary graduate	10	28	32	33	28
University graduate	0	3	10	28	10
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	32	33	27	8	100
Not secondary graduate	95	99	81	25	300
Secondary graduate	7	50	63	33	153
Non-university post-secondary graduate	11	61	79	50	202
University graduate	0	5	24	42	72
Total	113	216	248	150	728

7.8.3 Language Use

There is a slightly higher than expected percentage of people in Saskatchewan whose first language is other than English or French. As in other Western provinces, it should be studied whether these are elderly Eastern European immigrants, Native Canadians or "New" Canadians.

TABLE 27: SASKATCHEWAN—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	11	29	37	23	100
English, learned French, Eng at home	5	23	27	46	100
French, (unilingual)	92	8	0	0	100
French, learned English, Fr at home	26	29	34	12	100
French, learned English, Eng at home	23	32	33	12	100
Allophone, Eng or Fr at home	32	35	26	8	100
Allophone, neither Eng nor Fr at home	55	31	8	6	100
Total	16	30	34	21	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	56	78	86	87	79
English, learned French, Eng at home	1	2	2	6	3
French (unilingual)	0	0	0	0	0
French, learned English, Fr at home	1	1	1	0	1
French, learned English, Eng at home	2	2	2	1	2
Allophone, Eng or Fr at home	23	13	8	4	11
Allophone, neither Eng nor Fr at home	18	5	1	1	5
Total	100	100	100	100	100

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	63	167	215	131	576
English, learned French, Eng at home	1	4	5	9	19
French, (unilingual)	0	0	0	0	0
French, learned English, Fr at home	1	1	2	1	5
French, learned English, Eng at home	3	4	4	1	12
Allophone, Eng or Fr at home	25	28	20	6	80
Allophone, neither Eng nor Fr at home	20	11	3	2	36
Total	113	216	248	150	728

7.9 ALBERTA PROSE LITERACY AND DEMOGRAPHIC ESTIMATES

7.9.1 Age

Alberta has a relatively young population, and this is reflected in the literacy estimates.

TABLE 28: ALBERTA—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	1	2	3	4/5	Total
16-25	5	31	42	22	100
26-35	8	25	35	32	100
36-45	9	23	37	31	100
46-55	11	32	31	26	100
56-65	19	32	37	12	100
over 65	45	34	20	1	100
Total	14	28	35	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	1	2	3	4/5	Total
16-25	7	20	22	17	18
26-35	13	20	23	30	23
36-45	15	19	25	31	23
46-55	13	18	14	17	16
56-65	13	11	10	5	9
over 65	38	13	6	1	11
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	1	2	3	4/5	Total
16-25	20	112	153	79	364
26-35	36	115	160	144	456
36-45	42	106	172	146	466
46-55	36	102	98	81	317
56-65	36	61	69	23	189
over 65	103	77	44	3	228
Total	273	571	697	477	2,019

7.9.2 Education

Roughly 41% of the Level 1 group in Alberta had eight years or less of schooling.

TABLE 29: ALBERTA—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	30	32	29	9	100
Secondary graduate	7	33	40	20	100
Non-university post-secondary graduate	7	29	37	26	100
University graduate	1	9	32	58	100
Total	14	28	35	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	71	36	27	13	32
Secondary graduate	11	27	27	20	23
Non-university post-secondary graduate	17	33	34	34	31
University graduate	1	4	12	33	13
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVELS, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	194	206	189	60	648
Secondary graduate	31	155	186	95	467
Non-university post-secondary graduate	46	186	236	163	631
University graduate	3	25	86	159	272
Total	273	571	697	477	2,019

7.9.3 Language Use

Alberta has more than expected percentages of people in Level 1 (but not Level 2) whose first language is neither English nor French. Further study is needed to know whether these are "New" Canadians, elderly Eastern European immigrants or Native Canadians.

TABLE 30: ALBERTA—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	8	27	38	26	100
English, learned French, Eng at home	3	20	25	51	100
French (unilingual)	34	32	31	3	100
French, learned English, Fr at home	20	32	38	11	100
French, learned English, Eng at home	16	31	37	16	100
Allophone, Eng or Fr at home	20	34	33	13	100
Allophone, neither Eng nor Fr at home	52	34	7	7	100
Total	14	28	35	24	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	46	72	83	82	75
English, learned French, Eng at home	16	3	3	8	4
French (unilingual)	0	0	0	0	0
French, learned English, Fr at home	1	1	1	0	1
French, learned English, Eng at home	2	2	2	1	2
Allophone, Eng or Fr at home	15	12	10	5	10
Allophone, neither Eng nor Fr at home	34	11	2	3	9
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY LANGUAGE AND LITERACY LEVELS, IN THOUSANDS

Languages	1	2	3	4/5	Total
English (unilingual)	127	410	580	393	1,510
English, learned French	3	15	19	39	76
French (unilingual)	0	0	0	0	1
French, learned English, Fr at home	3	4	5	2	14
French, learned English, English at home	5	11	13	6	35
Allophone, Eng or Fr at home	41	69	67	25	202
Allophone, neither, Eng nor Fr at home	94	62	13	13	181
Total	273	571	697	477	2,019

7.10 British Columbia Prose Literacy and Demographic Estimates

7.10.1 Age

TABLE 31: BRITISH COLUMBIA—PROSE LITERACY BY AGE GROUPS

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR AGE GROUPS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	8	32	39	20	100
26-35	10	27	34	30	100
36-45	11	24	35	30	100
46-55	13	31	30	26	100
56-65	21	30	35	13	100
over 65	43	33	22	2	100
Total	16	29	33	22	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY AGE

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	8	19	20	15	17
26-35	13	19	21	28	20
36-45	15	18	23	30	22
46-55	13	18	15	19	17
56-65	14	11	11	6	11
over 65	37	16	10	1	14
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY AGE GROUPS, IN THOUSANDS

	Level				
Age	**1**	**2**	**3**	**4/5**	**Total**
16-25	38	154	189	98	479
26-35	60	157	197	174	588
36-45	70	147	220	188	624
46-55	63	149	141	123	476
56-65	65	93	108	41	307
over 65	174	133	90	9	406
Total	470	833	945	632	2,880

7.10.1 Education

British Columbia has the largest percentage of people with secondary diplomas with Level 1 literacy. Over one-quarter of Level 1, and over three-quarters of Level 2, hold at least a high school diploma. Roughly 37% of the Level 1 group in British Columbia have eight years or less of schooling.

TABLE 32: BRITISH COLUMBIA—PROSE LITERACY BY EDUCATION

PERCENTAGE DISTRIBUTION OF LITERACY LEVELS FOR EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	36	30	26	8	100
Secondary graduate	10	35	37	18	100
Non-university post-secondary graduate	10	31	36	23	100
University graduate	2	13	31	54	100
Total	16	29	33	22	100

PERCENTAGE COMPOSITION OF LITERACY LEVELS BY EDUCATION GROUPS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not Secondary graduate	64	30	24	11	29
Secondary graduate	15	29	28	20	25
Non-university post-secondary graduate	19	34	35	33	32
University graduate	2	6	14	36	14
Total	100	100	100	100	100

ESTIMATED COUNTS OF NUMBERS OF PERSONS BY EDUCATION LEVEL, IN THOUSANDS

Highest Level of Schooling	Level 1	2	3	4/5	Total
Not secondary graduate	302	254	222	69	847
Secondary graduate	70	246	262	129	707
Non-university post-secondary graduate	89	281	331	210	911
University graduate	8	53	129	224	414
Total	470	833	945	632	2,880

7.10.2 Language Use

British Columbia has the largest percentage of "other" first language speakers. Allophones make up over half of Level 1, and almost one-third of Level 2 in BC. Further study could confirm that this is a combination of a larger Native Canadian population and also a large New Canadian population.

TABLE 33: BRITISH COLUMBIA—PROSE LITERACY LEVEL BY FIRST LANGUAGE, OFFICIAL LANGUAGE, LANGUAGE USED AT HOME

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	10	27	38	24	100
English, learned French, Eng at home	4	19	25	52	100
French (unilingual)	41	27	26	6	100
French, learned English, Fr at home	16	26	43	15	100
French, learned English, Eng at home	18	30	37	16	100
Allophone, Eng or Fr at home	17	34	35	14	100
Allophone, neither Eng nor Fr at home	48	37	7	8	100
Total	16	29	33	22	100

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English, (unilingual)	44	65	81	78	70
English, learned French, Eng at home	1	3	3	10	4
French (unilingual)	0	0	0	0	0
French, learned English, Fr at home	0	0	1	0	0
French, learned English, Eng at home	1	1	1	1	1
Allophone, Eng or Fr at home	11	13	11	7	11
Allophone, neither Eng nor Fr at home	42	18	3	5	14
Total	100	100	100	100	100

PERCENTAGE DISTRIBUTION OF LITERACY FOR LANGUAGE GROUPS

Languages	1	2	3	4/5	Total
English (unilingual)	209	554	763	490	2,005
English, learned French, Eng at home	5	22	29	61	117
French (unilingual)	0	0	0	0	1
French, learned English, Fr at home	2	3	5	2	12
French, learned English, Eng at home	6	10	13	5	34
Allophone, Eng or Fr at home	53	107	106	42	305
Allophone, neither Eng nor Fr at home	195	150	29	32	405
Total	470	833	945	632	2,880

8. Moving the Markers: Findings, Implications and Recommendations

Stated most broadly, the main findings of this project are as follows:

- Literacy rate statistics are used to influence the development of literacy policies and programs.
- All existing methods used to develop literacy rate statistics have significant technical and conceptual limitations.
- Demographic patterns found in literacy rate statistics provide information about target groups that is highly relevant to literacy-related interventions.
- Self-assessments of literacy skills by IALS participants provide important information about the challenges of improving literacy rates in Canada.

Literacy rate statistics and the interpretations made of them influence the development of Canada's literacy policies and programs. The same set of numbers can and will be presented and/or interpreted differently by different researchers.

This chapter considers some of the implications of these findings and makes recommendations for moving the markers on adult literacy in Canada. This chapter also introduces and discusses two hypotheses about characteristics of the Levels 1 and Level 2 groups that were not directly tested but nevertheless evolved over the course of this project. Specifically, these hypotheses are related to:

- the prevalence of people with special learning challenges in the lowest literacy level (Level 1) group; and
- special issues associated with improving the literacy skills of people in the second lowest literacy level (i.e., Level 2).

8.1 LITERACY RATE STATISTICS ARE USED TO INFLUENCE THE DEVELOPMENT OF LITERACY POLICIES AND PROGRAMS

Literacy rate statistics and the interpretations made of them influence the development of Canada's literacy policies and programs. The same

set of numbers can and will be presented and/or interpreted differently by different researchers. For example, while Statistics Canada has emphasized the distribution of literacy levels within specific demographic categories, this project has emphasized the composition of literacy level groups according to demographic categories. These are different presentations of the same data.

Each researcher develops presentations and arrives at interpretations that are most consistent with his or her own preferred hypotheses and goals. Researchers are expected and supposed to take different slants on data. That's how research works—how it helps develop new knowledge.

The risk of statistics being used to prove only whatever the researcher wants it to prove increases when too few people have access to the data, and/or take the time to look carefully at the numbers and critically consider how they have been interpreted. The onus is on research consumers to discern between statements of fact (e.g., what the numbers are) and the researchers' interpretations of those facts (e.g., what the numbers mean).

The risk of statistics being used to prove only whatever the researcher wants it to prove increases when too few people have access to the data, and/or take the time to look carefully at the numbers and critically consider how they have been interpreted. The onus is on research consumers to discern between statements of fact (e.g., what the numbers are) and the researchers' interpretations of those facts (e.g., what the numbers mean).

Literacy rate reports provide useful information about the correlations between literacy and other variables (e.g., age, education, income, income source, employment status, etc.) The fact that two variables are correlated only proves that the variables perform in a synchronized way. Correlations do not prove that one variable causes the other. Statements about cause and effect relationships found in literacy rate data (e.g. low literacy causes poverty; low literacy causes poor health; literacy is like a muscle—use it or lose it) are statements of researchers' speculations. Other researchers may identify plausible, alternative explanations for the same correlations.

Sometimes researchers' conclusions cannot be clearly linked to the data. Once again, the onus is on the research consumer to critically consider conclusions. For example, numerous reports on IALS conclude that "Individuals at Level 1 are generally aware that they have [literacy] problems". Canadian IALS data appears to suggest otherwise. When asked to rate their own reading skills for everyday life, only 20% of the Level 1 group rated their skills as poor. 57% of the Level 1

Numerous reports on IALS conclude that "Individuals at Level 1 are generally aware that they have [literacy] problems". Canadian IALS data appears to suggest otherwise. When asked to rate their own reading skills for everyday life, only 20% of the Level 1 group rated their skills as poor.

group rated their skills as excellent and 24% rated their skills as moderate. When survey participants in the labour force were asked to rate the extent to which their reading skills limited their job opportunities only 13% of the Level 1 group said their skills were greatly limiting their opportunities. 60% of the Level 1 group said they were not at all limiting and 27% said they were somewhat limiting.

When literacy rate data is used to inform the design of literacy policies and programs it is important to ensure that all plausible interpretations of that data have been considered.

When literacy rate data is used to inform the design of literacy policies and programs it is important to ensure that all plausible interpretations of that data have been considered.

Recommendations

1. Given the potential influence of literacy rate data on the development of policies and programs, alternative plausible interpretations of literacy rate data should always be identified and considered before that data is used to inform policy decisions.

2. Researchers from various professional affiliations and theoretical persuasions should be involved in interpreting literacy rate data as early as possible in data analysis and policy development processes.

3. Consumers of research should be encouraged to take more time to, and/or supported to reflect critically on literacy rate data and related interpretations.

4. Training for advocates, policy-makers and other interested parties in how to critically review literacy rate research should be included in initiatives to build Canada's literacy-related research capacity.

8.2 THE AVAILABLE LITERACY RATE DATA HAS SIGNIFICANT TECHNICAL AND CONCEPTUAL LIMITATIONS

There is a global movement to make public policy decision-making less political and more rational and "evidence-based". Proponents of evidence-based decision argue that high quality empirical research provides the best and most defensible basis for public policy-making. This movement is gaining momentum, apparently in response and

proportion to ever-increasing demands for cost-effectiveness and accountability in public spending.

The key to moving forward in a rational way is to encourage debate and critical reflection about what we think we know and to consider what research tells us about literacy.

We have learned a great deal about Canada's adult literacy challenges from each and every effort to systematically examine hypotheses and assumptions about the dynamics of literacy. The key to moving forward in a rational way is to encourage debate and critical reflection about what we think we know and to consider what research tells us about literacy.

Having said this, it must be acknowledged that if all public policy had to be based on irrefutable research evidence alone, we would have very few public policies. Simply put, what is known about most areas of public concern is far less than what is not known. This is certainly the case when it comes to what is known about the actual dimensions and impacts of adult literacy problems in Canada.

For starters, there is no consensus about what it means to be literate.

For starters, there is no consensus about what it means to be literate. Cogent arguments can be made for any number of interpretations of the concept. This lack of consensus on what we're talking about when we talk about literacy dilutes our focus and thus constitutes a significant barrier to strengthening and coordinating efforts to move the literacy markers. Debate and decision-making must be grounded in a shared understanding of the meaning of the word literacy, if only for the specific purposes of the debate and the decisions to be made.

Debate and decision-making must be grounded in a shared understanding of the meaning of the word literacy, if only for the specific purposes of the debate and the decisions to be made.

The investment in developing literacy rate estimates should be commensurate with the intended uses of those estimates.

Each approach to developing literacy rate statistics has its own strengths and limitations, and all literacy rate statistics are susceptible to being criticized and/or rejected by experts. Clearly some approaches to developing literacy rate estimates are far more complex, time consuming and expensive than others. The investment in developing literacy rate estimates should be commensurate with the intended uses of those estimates. Literacy rate estimates can and likely will be used to generate public awareness, support policy and program development decisions and evaluate policy and program outcomes. Can and/or should the same measurement approach be used to serve these diverse needs? If not, how do we get the best value from our investment in literacy rate research?

Recommendations

5. Consumers of research should be encouraged to take more time to, and/or supported to reflect critically on literacy rate data and related interpretations.

6. Training for advocates, policy-makers and other interested parties in how to critically review literacy rate research should be included in initiatives to build Canada's literacy-related research capacity.

7. The costs and benefits of various approaches to developing literacy rate data, for various purposes, should be systematically assessed and compared. This analysis should inform future decisions about investments in literacy rate studies. The federal government should take the lead on this, in concert with literacy stakeholders across Canada.

8.3 DEMOGRAPHIC PATTERNS IN STATISTICS PROVIDE USEFUL INFORMATION

Literacy programs and services are expected to meet the needs of specific target population(s). Information about the demographic characteristics and likely motivations of Canadians with low literacy skills can and should be used to develop more effective and efficient learner recruitment strategies, and more relevant program goals, schedules and content.

Although Statistics Canada has cautioned users against combining data from the Level 1 and Level 2 groups, presentations about the dimensions of Canada's literacy issues often combine the two.

Although Statistics Canada has cautioned users against combining data from the Level 1 and Level 2 groups, presentations about the dimensions of Canada's literacy issues often combine the two. The following example, taken from a special report on literacy, is typical.

> First the shock, then the look of disbelief. Tell anyone that 48 percent of adult Canadians have low literacy skills and such reactions are almost inevitable…Overall, more than 10 million Canadian adults – [the] staggering figure of 48% — fell in the bottom two levels of the (IALS) survey's five-level scale….(Calamai, 1999).

Demographic analyses of IALS data on Canadian adults in Level 1 and Level 2 groups reveal significant differences between these groups. These differences are summarized in Table 34.

Demographic analyses of IALS data on Canadian adults in Level 1 and Level 2 groups reveal significant differences between these groups.

TABLE 34. SUMMARY OF THE COMPOSITION OF LEVEL 1 AND LEVEL 2 (PROSE) GROUPS BY SPECIFIC DEMOGRAPHIC VARIABLES

Variable	Level 1 group (4.5 million)	Level 2 group (5.5 million)
Age		
16 to 25	8 %	17%
26 to 44	39%	60%
56 and over	54%	24%
First Language		
English	36%	54%
French	31%	27%
Neither English nor French (i.e. Allophone)	33%	18%
Highest level education		
Primary or less	56%	11%
Primary to some secondary	81%	39%
Secondary completed	15%	40%
Post-secondary	5%	22%

Recommendations

8. The distinctions between Level 1 and Level 2 groups should be described in all presentations and policy discussions about Canada's literacy challenges.

9. The demographic differences between the Level 1 and Level 2 groups should be reflected and accommodated for in literacy program outreach strategies, goals, content and schedules.

Low Literacy and Age

At the national level, people over age 56 make up more than half (54%) of the Level 1 group. In comparison, people over age 56 make up less than one-quarter of the Level 2 group. The probit regression

analysis carried out for this study gives us reason to consider the effects of aging on literacy skills. The regression shows that people in the 66 years and over age group are more likely to be at Level 1 than 36 to 45 years olds, even when the effects of education, gender and language have been accounted for.

There are approximately 830,000 people at Level 1 between ages 56 and 65. Older workers in this group are likely to be disadvantaged by their literacy limitations in the labour market. However, literacy upgrading alone may not be sufficient to substantially improve their employment opportunities. Laid-off and/or under-employed older workers face many barriers to re-employment and/or employment mobility, low literacy being only one of them.

At the same time, older workers are more likely than their younger colleagues to have accumulated personal savings that they can draw on until a company or government pension kicks in. Given these factors, some low-literate older workers may be less motivated than younger workers to pursue literacy upgrading for purposes exclusively related to their labour force participation.

Initiatives positioning literacy as a labour force development issue are unlikely to be relevant to the needs and interests of 1.5 million people in Level 1 who have already reached retirement age (65 and over).

Initiatives positioning literacy as a labour force development issue are unlikely to be relevant to the needs and interests of 1.5 million people in Level 1 who have already reached retirement age (65 and over). On the other hand pressures to do away with mandatory retirement at age 65 could result in increases in the numbers of seniors in Canada's future labour market. In any event, the number of older adults participating in literacy programs has not been tracked, nor has any research been carried out to determine what portion of low literate older Canadians would choose to spend their time upgrading their own literacy skills if they had the chance.

Issues related to health, retirement planning, independence and access to information about entitlements (e.g., Canada Pension Plan, Old Age Security) are common concerns for senior Canadians. It is disturbing to consider the potential impact of very low literacy skills on: the safe use medications; understanding and complying with medical instructions; locating and contracting for health services; understanding safety regulations and emergency procedures; shopping

for bargains; avoiding scams and frauds; planning for advanced care and financial estate administration; applying for and/or keeping track of retirement and old age benefits; using automated teller machines and other electronic information devices; providing care for others including pre-school and school-aged grandchildren and aging spouses; volunteering in the community; and participating in political activities. Whether or not Canadian seniors remain in the work force, or chose to work on improving their literacy skills, they still need to be able to access essential information in order to stay active, healthy, safe and independent longer.

Whether or not Canadian seniors remain in the work force, or chose to work on improving their literacy skills, they still need to be able to access essential information in order to stay active, healthy, safe and independent longer.

Some cynics argue that Canada's literacy problem will take care of itself if we just wait for the older Canadians to die. However, Canadians are living longer than ever before and it will be decades before the majority of those currently in the Level 1 group are no longer part of the population statistics. Meanwhile the health, safety, security, rights and freedoms of a majority of older Canadians may be compromised by low literacy skills.

The health, safety, security, rights and freedoms of a majority of older Canadians may be compromised by low literacy skills.

Recommendations

10. The impacts of low literacy on the well being of older adults should be systematically assessed.

11. The comparative effectiveness of different strategies for helping seniors overcome problems associated with low literacy should be evaluated.

12. All provincial and federal departments that provide services and programs for seniors should recognize low literacy among seniors as a priority concern.

13. Literacy upgrading for low-literate older workers should be linked to other kinds of services and supports designed to help older workers find and/or keep new jobs.

14. Access to information is important to all Canadians. New strategies to make important information more accessible for people with low literacy skills should be developed and implemented.

At the national level, the Level 1 group is comprised of nearly an equal mix of Anglophones, Francophones and Allophones, while the composition of the Level 2 group in terms of language is more like the composition of Canada as a whole. In comparison to their proportions in Canada as a whole, the proportion of Francophones at the lowest literacy level is slightly disproportionately high, and very disproportionately low at the highest level. At the national level, Francophones comprise just under one-third of the Level 1 group but only one-eighth of the Level 4/5 group. Meanwhile, at the national level, one-third of the Level 1 group doesn't have English or French as their first language (i.e. are Allophone), and one-quarter of these don't use English or French at home.

At the national level, one-third of the Level 1 group doesn't have English or French as their first language (i.e. are Allophone).

Allophones are a mixed group. Some have never acquired reading or writing skills in any language, while others are highly educated and literate in a language other than English or French. Some are newcomers to Canada; others have been here for decades, and still others are Native Canadians. Each of these possibilities introduces its own implications for literacy training.

It is commonly assumed that Allophones in Canada are concentrated in Toronto, Vancouver and Montreal. However, this study's provincial demographic estimates suggest that the distribution of Allophones in Canada is more complicated. All provinces west of Quebec, including Saskatchewan and Manitoba, show higher percentages of speakers of non-official languages at Level 1 and Level 2 than figures shown for the Maritime provinces and Quebec.

Some have also assumed that older immigrants have more problems with low literacy than younger immigrants. However research in Ontario shows that the incidence of low literacy skills, at least in that province, is almost as high among younger immigrants in Ontario as it is among older immigrants (Workplace Preparation Branch, 2000).

In decades ahead Canada will have to look outside its own borders to find and attract skilled workers. The opportunities that Canada provides for immigrants to improve their language and literacy skills in English or French will affect Canada's ability to attract and successfully incorporate immigrants.

Immigration trends will affect literacy rates in the future. If past experience is any indication of future directions, new immigrants may continue to contribute heavily to the numbers in the Level 1 literacy group, even as other Allophones already here move into higher levels as their literacy skills improve.

In decades ahead Canada will have to look outside its own borders to find and attract skilled workers. The opportunities that Canada provides for immigrants to improve their language and literacy skills in English or French will affect Canada's ability to attract and successfully incorporate immigrants.

Recommendations

15. The distinct literacy issues of Francophones should be a policy priority. In addition to strategies helping low-literate Francophones improve their skills, strategies to increase the proportion of Francophones at the highest literacy level should be developed and implemented.

16. An appropriate mix of literacy development and support services to meet the needs of different groups within the Allophone category should be provided.

17. Jurisdictional barriers between English or French as a Second Language (ESL and FSL) programs and literacy programs should be resolved with the goal of providing all Allophones in Canada with more timely access to more appropriate and effective language and literacy development services.

18. Allophone immigrants to Canada should be guaranteed access to adequate levels of language and literacy development and encouraged and supported to become sufficiently literate in English or French so that they can achieve their own goals and contribute to Canada to the full extent of their abilities. Access to these programs should extend beyond the period in which an Allophone is a newcomer to Canada.

19. The full range of effects of immigration on Canada's literacy rates and the composition of groups at each literacy level should be identified in future analyses of literacy rate statistics. Canada's immigration plans and trends should be taken into account when decision-makers plan future literacy initiatives.

Low Literacy and Education

Some people believe that Canada's adult literacy problems result from and reflect failures of the Canadian education system. Critics of Canada's schools argue that the incidence of low literacy is a function of school dropout rates and/or lower academic standards. However, statistical data suggests that the critics are wrong and their assumptions are flawed.

Years of education remain the strongest predictor of literacy levels. In other words, the more time one spends in school, the higher one's literacy level is likely to be. 81% of the Level 1 group never finished secondary school. More than half of that group never even started secondary school.

Dropout rates have never been lower in Canada than they are now. In 1975 the percentage of students in Ontario who began but did not complete secondary school was 45%. By 1990 this number had dropped to 34%. The same shift, with almost identical numbers, has occurred across all of Canada over the same period.

The fact is that older Canadians have less formal education than younger Canadians. It is the high proportion of older Canadians comprising the Level 1 group that helps account for the high proportion of under-educated adults in the Level 1 group.

In terms of education, the composition of the Level 2 groups is substantially different from that of Level 1. There are plenty of secondary school graduates in the Level 2 group - three out of five (62%) people in Level 2 have completed secondary school. Many of these (22%) have attended post-secondary school. What meaning should we take from this observation?

Some critics of the current school system in Canada argue that lower academic standards are making it easier for young people to graduate without adequate literacy skills. Data from IALS neither supports nor disproves that notion. It is likely that a significant portion of those high school graduates in the two lowest literacy levels graduated from secondary schools outside of Canada, and immigrated to Canada as adults with literacy in a third language.

Some critics of today's schools seem to be convinced that most things, including the schools, were better when they were young. The

fact is that dropout rates have declined and Canadian education has become more democratic. Higher proportions of students from less privileged backgrounds are completing secondary school today than ever before. A generation ago many of these working class students might have dropped out of school before completing their secondary education. Unconscious class biases may be at play when critics suggest educational standards have declined.

An alternative explanation for the high incidence of secondary school graduates in Level 2 is that Level 3 is too high a standard for "good enough" literacy skills, or that the 80% probability criteria used to assign survey participants to literacy levels is too high. In other words, the problem may be with the standards being used to decide whether skill levels are good enough, rather than with the performance of secondary school graduates in the IALS Level 2 group. This is precisely what some experts in educational measurement now believe.

Recommendations

20. Basic skills upgrading and secondary school equivalency programs should be accessible to all adults in Canada who need them. Outreach and recruitment for these programs should be targeted primarily towards:

- people in the Level 1 group;
- people who have not completed secondary school;
- Allophones and Francophones within the Level 1 group; and
- people in Level 2 who graduated from secondary schools outside of Canada.

21. To reduce rates of low levels of adult literacy in the future:

- elementary and secondary school students should be encouraged and supported to stay in school for as long as possible.
- extra supports should be provided to help students with English or French as a second language succeed and stay in school.

International comparisons of literacy rates

IALS made it possible, for the first time, for literacy rates between nations to be compared, based on the same direct measure. Subsequent reports of international comparisons have tended to emphasize differences in overall rates, and patterns within specific demographic groups.

The demographic makeup of each nation and demographic patterns within literacy level groups in each nation are potentially very relevant when comparing the performance of different nations.

The demographic makeup of each nation and demographic patterns within literacy level groups in each nation are potentially very relevant when comparing the performance of different nations. For example, two nations might show similar literacy levels within age groups, but different overall rates because of differences in the proportions of specific age groups within the population as a whole. Or there might be significant differences in overall literacy rates between linguistically homogenous and linguistically heterogeneous nations.

Recommendations

22. Comparisons of literacy rates between nations should include information about the demographic compositions of those nations and of specific literacy level groups.

8.4 DATA FROM SELF-ASSESSMENTS PROVIDE IMPORTANT INFORMATION

There is a major discrepancy between IALS's self-assessment data for people in the two lowest literacy level groups and their actual performance ratings in the survey.

Participants' self-assessments of literacy skills were collected as part of IALS. This data provides important perspectives on challenges associated with moving the markers on literacy in Canada.

There is a major discrepancy between IALS's self-assessment data for people in the two lowest literacy level groups and their actual performance ratings in the survey. IALS participants' evaluations of their own skills, applied in their own real lives, are significantly higher than would be predicted by their performance on IALS test items.

Self-assessment data for the Level 1 and Level 2 groups in IALS is summarized below in Table 36.

TABLE 35. SELF-ASSESSMENTS OF LITERACY SKILLS
(EXTRACTED FROM *READING THE FUTURE*, TABLES 3.13 AND 3.25)

	How do you rate your reading skills for everyday life? (Document scale)	
	Level 1	**Level 2**
Excellent or good	57%	90%
Moderate	24%	8%
Poor	20%	–
	To what extent are your reading skills limiting your job opportunities? (age 16 and over in the labour force) (Prose scale)	
	Level 1	**Level 2**
Not limiting	60%	84%
Somewhat limiting	27%	12%
Greatly limiting	13%	–

A majority of the Level 1 group (57%) says that their reading skills for everyday life are excellent or good, and an additional 24% rate their skills as moderate.

Statistics Canada describes the Level 1 group as having great difficulty with reading, and few basic skills or strategies available to them to allow them to decode and work with text. Yet a majority of the Level 1 group (57%) says that their reading skills for everyday life are excellent or good, and an additional 24% rate their skills as moderate. Similarly 60% of the Level 1 group currently in the labour force says that their reading skills are not limiting their job opportunities at all, while 27% say that their reading skills limit job opportunities moderately, and 13% say their skills are greatly limiting.

A large majority of people (90%) in Level 2 rate their own reading skills (prose) as good or excellent, and 84% say their job opportunities are not limited by their reading skills.

Statistics Canada tells us that most people at Level 2 can read but not well, and can only deal with material that is simple, clearly laid out and in which the reading tasks involved are not too complex. Yet a large majority of people (90%) in Level 2 rate their own reading skills (prose) as good or excellent, and 84% say their job opportunities are not limited by their reading skills.

A study of the skills literacy of Ontario's immigrants, modeled on IALS, had similar findings. Even among those who scored at the

lowest literacy level, most say they do not have a problem with reading or writing. The majority rate their reading skills as good or excellent; and only a small percentage feel that their reading skills limit their job opportunities (Workplace Preparation Branch, 2000).

Several hypotheses have been put forward to explain these discrepancies. Some attribute the discrepancies to participants' attitudes towards literacy.

Several hypotheses have been put forward to explain these discrepancies. Some attribute the discrepancies to participants' attitudes towards literacy. One such hypothesis is that Canadians are "in denial". Another is that participants over-rate their own skills because they are self-conscious about their limitations and trying to avoid stigmatization.

Other hypotheses link the discrepancies to survey design elements.

Other hypotheses link the discrepancies to survey design elements. For example, noting that Level 1 captures a relatively wide range of ability (scale scores from 0 to 225), Jones (1999) suggests that those in Level 1 who rate their skills as good or excellent may be at the top of their range. Another hypothesis is that the cognitive demands of test items in IALS exceed the demands normally encountered in daily living by participants. Some researchers argue that the performance standards applied in IALS are unrealistically and unreasonably high. According to IALS, only 51% of university graduates across Canada perform at the highest literacy levels, Levels 4/5. What's going on with the universities?

Kolstad, the original project director of the National Adult Literacy Survey, is particularly critical of the use of an 80% response probability for classifying survey participants into one of five literacy levels. He suggests that a 50% response probability would be a more valid measure of what adults can and can't do. Using the lower response probability would cut estimates of the number of adults in the two lowest levels by half, and presumably move more university graduates into the highest literacy level.

Unquestionably, self-perceptions around literacy skills will have a profound impact on people's motivations to work on improving those skills.

Unquestionably, self-perceptions around literacy skills will have a profound impact on people's motivations to work on improving those skills. Many adults find it very difficult to find the motivation and discipline to work on problems they know they have—consider for example, the number who continue to smoke or the number who remain dangerously overweight. Those who believe their literacy skills

are excellent or at least good enough are unlikely to participate in literacy upgrading programs.

In fact, student recruitment and retention has been identified as a problem in several Canadian and other North American jurisdictions. Hautecoeur (1990) observed an over-supply of spaces for adult literacy students in Quebec, when that province first guaranteed access to literacy upgrading for all adults requiring it. Wagner and Venezky (1994) note that literacy programs in the U.S. are often unable to prove that demand for training exceeds supply. Recruitment of students to literacy programs has been a problem in Ontario, on and off, for the past ten years at least (Sussman, 2000). There is anecdotal evidence that few Anglophones participate in literacy programs in Quebec.

Literacy programs that encourage the participation of older Canadians, and/or Canadians with English or French as a Second Language are more likely to attract people in the Level 1 group than those that don't.

The relationship between demand for literacy education and its supply is likely to be affected by:

- adults' perceptions of need to improve their skills;
- the focus and scope of literacy programs and criteria for admitting students; and
- the number of spaces available for students.

This study's demographic analysis of groups with low literacy levels suggests that literacy programs that encourage the participation of older Canadians, and/or Canadians with English or French as a Second Language are more likely to attract people in the Level 1 group than those that don't. Nevertheless, even programs that target these "at-risk" Level 1 populations may have difficulty attracting the majority of people in that group who appear to believe that their own skills are adequate.

Literacy programs that emphasize the basics of reading and writing and/or upgrading to a high school equivalency are likely to have trouble attracting students from the Level 2 group.

Literacy programs that emphasize the basics of reading and writing and/or upgrading to a high school equivalency are likely to have trouble attracting students from the Level 2 group. The majority of people in Level 2 have already graduated from secondary school and have largely positive opinions of their own literacy skills. People in Level 2 who graduated from secondary schools outside of Canada may

be more inclined than others to come forward to such basic programs. Finally, it is important to remember that Canada's literacy programs have already served thousands of people with low literacy skills. When estimating the potential demand for literacy programs, total potential demand based on literacy rate estimates may need to be reduced by the number of adult learners who have already participated in programs.

Recommendations

23. The issue of where to set the bar for "good enough" literacy skills requires further consideration. Standard setting should be informed by the best available empirical evidence as well as by anecdotal evidence provided by adults with literacy difficulties.

8.5 WHAT ARE THE EFFECTS OF PEOPLE WITH SPECIAL LEARNING CHALLENGES ON LITERACY RATE STATISTICS?

The term "special learning challenges" is used here to denote a wide variety of conditions that making learning difficult under ordinary conditions. This includes the challenges that come from learning disabilities, physical disabilities, and/or barriers to learning resulting from lasting, negative effects of extremely difficult social / emotional experiences. The effects of people with special learning challenges on literacy rate statistics have not been systematically assessed in the context of this project. This is a subject worthy of further research because of the potential for major implications for literacy policies and programs.

According to the Learning Disabilities Association of Canada, 10% of the Canadian population is learning disabled, with reading difficulties as the most common symptom. The British Dyslexia Association claims that 4% of Britain's population is severely dyslexic, and an additional 6% are mildly to moderately dyslexic. A 1999 Canadian study by Kapsalis reports that 52% of Canadians between the ages of 16 and 55 who have learning disabilities fit into the IALS level 1 category. Similarly, the National Institute for Literacy (NIFL) in the United States

reports that 87% of people with intellectual disabilities and 58% of the learning disabled population have literacy scores equivalent to IALS Level 1. Kapsalis also reports that 15% of people with physical disabilities (excluding intellectual disabilities or mental health disabilities) fit into the IALS Level 1 category, while NIFL reports that 36% to 53% of those with physical disabilities and 54% of those with visual difficulties are at the lowest literacy level as well.

Further research is needed to explore the possibility that once older adults (56 years and over) (54% of Level 1) and Allophones (33% of Level 1) are subtracted from the Level 1 group, people with special learning challenges comprise a majority of the remaining Level 1 group.

Recommendations

24. Research should be undertaken to identify the prevalence and distribution of people with special learning challenges in general literacy rate statistics.

25. Federal, provincial and local literacy decision-makers should act quickly on specific recommendations contained in *Literacy and Disabilities* (Macht, 2000) including:

- making all mainstream literacy programs accessible to people with all types of disabilities.
- making time-lines and student expectations in literacy programs more flexible to allow for the inclusion of people with disabilities.
- increasing the use of computers in adult literacy programs and access to technical aids and assistive devices.
- providing support care (attendants or scribes) when necessary to enable a disabled person to participate in a literacy program.
- screening all adults in literacy programs for learning difficulties, including learning disabilities and hearing or visual disabilities.
- ensuring that people who work or volunteer in literacy programs are fully aware of and trained to deal with issues presented by students with disabilities.

- supporting and encouraging disability organizations to recruit and train their own literacy instructors and volunteers.

8.6 WHY WOULD PEOPLE IN THE LEVEL 2 GROUP WANT AND/OR NEED TO IMPROVE THEIR LITERACY SKILLS?

IALS shows that adults in the lowest literacy skills group (i.e. Level 1) are clearly the most disadvantaged in terms of income, income source and employment status, and that they are substantially more disadvantaged than people in the Level 2 group.

IALS shows that adults in the lowest literacy skills group (i.e. Level 1) are clearly the most disadvantaged in terms of income, income source and employment status, and that they are substantially more disadvantaged than people in the Level 2 group. Based on similar findings in US data, the National Institute For Literacy (1998) concludes, "While we are concerned about improving the literacy of all adults, we consider those scoring at the lowest level (Level 1) to be most urgently in need of nationwide attention".

In many respects the Level 2 group from IALS looks more like higher-level groups than it does like the Level 1 group. *Reading the Future* (1997) shows similar levels of employment and unemployment and nearly identical average numbers of weeks worked among Canadian adults (age 16 years and over in the labour force) at IALS Levels 2 and 3 (see Statistics Canada, Reading the Future, Tables 2.5 and 2.6). Also noted is that "the data suggests that differences in skill may have little role in whether work is full- or part-time (Table 2.12)". While the present study shows distinctive demographic characteristics in Canada's Level 1 group, no distinctive demographic patterns are found within the Level 2 group except one: the composition of the Prose Level 2 group is very similar to the composition of the Canadian adult population at large in terms of age, language and fairly similar in terms of education.

These findings, coupled with the fact that the large majority of people in the Level 2 group rate their own reading and writing skills as excellent or good, call into question why it should be a priority to improve the literacy skills of people in the Level 2 group, and what it would take to motivate people in this group to participate in literacy upgrading.

These findings, coupled with the fact that the large majority of people in the Level 2 group rate their own reading and writing skills as excellent or good, call into question why it should be a priority to improve the literacy skills of people in the Level 2 group, and what it would take to motivate people in this group to participate in literacy upgrading. The present project has not looked at these questions systematically. Nevertheless, two related hypotheses emerged as I reflected on my use of the Internet over the course of this project, and the literacy skills that it requires.

The Internet allowed me to find and access to most of the information used during this project. What was involved? Obviously, I needed to know how to turn the computer on, which keys to strike, where and when to click or double click the mouse, how to connect to the internet and which search engine to use. These skills, often grouped under the heading "computer literacy", were necessary but not sufficient to allow me to use the Internet to find the information I wanted.

I also had to guess at search terms, and if at first they didn't succeed, I had to come up with alternatives. When searches resulted in "hits" I had to scroll through long dense lists of website headings, using inference to figure out which sites might be most relevant to my interests. I had to ignore pop-up advertisements for vitamins and little spy cameras. I had to scan through lengthy, dense documents to find portions that interested me, while ignoring those that were not relevant.

Reflecting on the demands of the Internet, I wondered how well people in the Level 2 literacy group would be able to use the information superhighway. According to IALS, people in the Level 2 group cannot reliably handle (i.e. with 80% probability of responding correctly). Level 3 or higher tasks. The demands associated with tasks at IALS Level 3 and higher are described as follows:

> [Prose Level 3] tasks tend to direct readers to search texts to match information that require low-level inferences that meet specified conditions. Sometimes the reader is required to identify several pieces of information that are located in different sentences or paragraphs rather than in a single sentence. Readers may also be asked to integrate or to compare and contrast information across paragraphs or sections of text…[Prose Level 4] tasks require readers to perform multiple-feature matching or to provide several responses where the requested information must be identified through text-based inferences. Tasks at this level may also require the reader to integrate or

> contrast pieces of information, sometimes presented in relatively lengthy texts. Typically, these texts contain more distracting information and the information that is required is more abstract…(Prose Level 5 tasks) require the reader to search for information in dense text that contains a number of plausible distractors. Some require readers to make high-level inferences or use specialized knowledge."

In an informal survey, I asked friends and family members to rate their own reading and writing skills as well as their own ability to find information on the Internet. Most claimed to have strong reading and writing skills; however more than a third freely admitted that they rarely find the information they need using the Internet. They seemed certain that their difficulties with the net had to do with deficiencies in the technology, and not with their own skill limitations.

These observations and reflections led me to form the following hypothesis: that effective and efficient use of the Internet requires literacy skills at Level 3 or higher. The hypothesis warrants further consideration. If validated, this notion could lead to new strategies for motivating adults in the Level 2 group to improve their literacy skills, and would have many implications for literacy policies and programs.

Effective and efficient use of the Internet requires literacy skills at Level 3 or higher.

Recommendations

26. Research on the literacy demands associated with the use of the Internet should be carried out. Findings from this research should inform the development of new strategies to improve literacy levels among Canadians in the Level 2 group.

Appendix 1. Probit Analysis

The following discussion, tables and analyses were developed by Dr. Michael Ornstein, of the Institute for Social Research, York University in July 2000.

Probit analysis, a type of regression analysis, is often used to look at variables assumed to be normal, which are divided into discrete categories (e.g. taking the distribution of literacy and deciding some group is at Level 1). Statisticians often assume normal distributions when there are thought to be a variety of causes of a phenomenon, and when the measured distribution looks normal, as does literacy.

Probit analysis and logistic regression (which is more commonly used) give very similar results under most circumstances. Probit analysis was used here, because it makes sense to think that literacy has an underlying approximately normal distribution; and the definition of the levels of literacy involved cutting this distribution at specific points.

Appendix tables 1A–C show pseudo R^2 values for probit analyses predicting literacy Levels 1 and 2.

- "A" tables show values for prose literacy;
- "B" tables show values for document literacy; and
- "C" tables show values for quantitative literacy.

Going from top to bottom, each table first gives pseudo R^2 values for Level 1 versus all other literacy levels; and then for Level 2 versus literacy Levels 3 through 5.

Each row shows how much variation (out of 1) the variable explains. For example, the "model" for prose literacy Level 1, with variables of gender, age, education and language as predictors, "explains" 43.6% (.436 in the table) of the variance. This is a very large proportion for models of this kind.

"Model" in this sense, refers merely to an equation with particular predictors and one outcome (here, prose literacy Level 1 versus Levels

NATIONAL Probit Analyses Predicting Prose Literacy

APPENDIX 1, TABLE 1A: PSEUDO R-SQUARE VALUES FOR PROBIT ANALYSES PREDICTING PROSE LITERACY CATEGORIES 1 AND 2

For Category 1 versus all others

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.002	0.003	
Age	0.121	0.034	
Education	0.367	0.202	
First Language, Language at Home, Knowledge of Official Languages	0.102	0.040	
Total variables above	0.436		
Province of Secondary Graduation (place of birth for non-graduates)		0.024	
Total all variables			0.460

For Category 2 versus Categories 3-5

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.001	0.005	
Age	0.031	0.021	
Education	0.106	0.089	
First Language, Language at Home, Knowledge of Official Languages	0.037	0.034	
Total variables above	0.162		
Province of Secondary Graduation (place of birth for non-graduates)		0.016	
Total all variables			0.178

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

NATIONAL
Probit Analyses Predicting Document Literacy

APPENDIX 1, TABLE 1B: PSEUDO R-SQUARE VALUES FOR PROBIT ANALYSES PREDICTING DOCUMENT LITERACY CATEGORIES 1 AND 2

For Category 1 versus all others

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.001	0.002	
Age	0.129	0.035	
Education	0.337	0.174	
First Language, Language at Home, Knowledge of Official Languages	0.096	0.034	
Total variables above	0.401		
Province of Secondary Graduation (place of birth for non-graduates)		0.021	
Total all variables			0.422

For Category 2 versus Categories 3-5

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.000	0.000	
Age	0.034	0.027	
Education	0.115	0.085	
First Language, Language at Home, Knowledge of Official Languages	0.027	0.015	
Total variables above	0.152		
Province of Secondary Graduation (place of birth for non-graduates)		0.008	
Total all variables			0.160

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

APPENDIX 1, TABLE 1C:
PSEUDO R-SQUARE VALUES FOR PROBIT ANALYSES PREDICTING QUANTITATIVE LITERACY CATEGORIES 1 AND 2

For Category 1 versus all others

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.000	0.001	
Age	0.124	0.025	
Education	0.376	0.222	
First Language, Language at Home, Knowledge of Official Languages	0.073	0.017	
Total variables above	0.417		
Province of Secondary Graduation (place of birth for non-graduates) 0.010		0.023	
Total all variables			0.440

For Category 2 versus Categories 3-5

Variables	Effect with no other variables in equation	"Unique" Effect, after inclusion of all other variables	Total
Gender	0.001	0.001	
Age	0.039	0.030	
Education	0.123	0.097	
First Language, Language at Home, Knowledge of Official Languages	0.054	0.041	
Total variables above	0.193		
Province of Secondary Graduation (place of birth for non-graduates)		0.010	
Total all variables			0.203

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

2-5). The term “variance” can only be used in a general sense, because in probit analysis there is no true variance (or "sum of squares").

The model of prose literacy for Level 1 versus the rest shows that:

- effect of gender in predicting being at Level 1 is very small (less than half of one percent).

- effect of age is big (12.1%) but most of this effect is attributable to education and language. The unique effect of age is only 3.4%

- effect of education is very strong—education alone accounts for 36.7% versus a total with all the variables of 43.6%. The effect of education is somewhat reduced by controls for age and language.

- Language has as big an effect as age, almost, but net of the other factors its effect is quite small.

- Adding province/country of post-secondary education explains a bit more variance—2.4 percent (the difference between 46.0 and 43.6). This is statistically significant.

Note that the patterns for the three types of literacy—prose, document and quantitative—are very, very similar. This suggests that they measure essentially the same trait.

Note too, that the pseudo R^2 values for the analyses of Level 2 versus Levels 3, 4 and 5, for all three literacy domains, are much lower. This means that knowing a person's age, education and language(s) tell you much less about whether they are in Level 2 than in Level 1. The relative effects of the different variables are similar, except that language plays more of a role, relatively, in the analysis for Level 2 versus 3, 4 and 5.

Appendix tables 2A–C and 3A–C provide probit regression coefficients showing the differences among the various categories, for the models whose predictive ability is given in Appendix table 1. The coefficients have no simple interpretation, except that bigger coefficients are more important. They are, however, important to the interpretation of the information in Appendix Table 1.

APPENDIX 1. TABLE 2A: PROBIT ANALYSIS FOR PROSE LITERACY LEVEL 1

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	-0.12	**-0.21**	**-0.22**	0.09	0.10	0.10	-1.34	-2.16	-2.28
Regression Constant	-0.75			0.06			-11.63		
AGE (RELATIVE TO 36-45)									
16-25	-0.14	-0.30	-0.26	0.16	0.16	0.17	-0.84	-1.83	-1.55
26-35	-0.05	-0.08	-0.05	0.15	0.16	0.16	-0.32	-0.51	-0.30
46-55	0.21	-0.10	-0.12	0.15	0.17	0.17	1.43	-0.57	-0.70
56-65	**0.85**	0.12	0.08	0.19	0.21	0.20	4.51	0.59	0.42
66 & older	**1.24**	**0.79**	**0.76**	0.13	0.14	0.15	9.29	5.63	5.20
Regression Constant	-1.14			0.11			-10.68		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**2.65**	**2.41**	**2.45**	0.19	0.21	0.21	14.16	11.35	11.56
Completed primary	**1.50**	**1.26**	**1.29**	0.19	0.16	0.16	8.09	8.04	8.29
Some secondary	**0.64**	**0.65**	**0.66**	0.12	0.12	0.12	5.40	5.29	5.37
Non-university post-secondary grad.	**-0.34**	-0.26	-0.33	0.16	0.15	0.15	-2.18	-1.74	-2.19
University graduate	**-0.99**	**-1.03**	**-1.23**	0.28	0.32	0.30	-3.60	-3.18	-4.08
Years of education (relative to average for level, above)	**-0.21**	**-0.15**	**-0.15**	0.04	0.04	0.04	-5.45	-3.76	-3.74
Regression Constant	-1.30			0.09			-14.25		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	**-0.75**	-0.26	-0.21	0.19	0.26	0.27	-3.97	-1.01	-0.78
French	**0.57**	-0.03	0.31	0.12	0.14	0.25	4.67	-0.19	1.22
French, learned English, French at home	0.07	-0.08	0.13	0.13	0.15	0.20	0.52	-0.55	0.64
French, English at Home	**0.58**	0.26	0.33	0.16	0.17	0.18	3.55	1.51	1.81
Both French and English, English at home	0.17	-0.12	-0.03	0.31	0.25	0.27	0.55	-0.49	-0.13
Both French and English, French at home	-0.63	-0.41	-0.24	0.42	0.32	0.37	-1.50	-1.29	-0.64
Not French or English, English or French at home	**0.33**	0.05	-0.13	0.14	0.18	0.21	2.32	0.28	-0.60
Not French or English, first language and at home	**1.33**	**1.13**	0.49	0.19	0.20	0.26	7.15	5.64	1.92
Regression Constant	**-1.06**			0.06			-19.19		
PROVINCE/NATION OF POST-SECONDARY COMPLETION (RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.59**		0.18	0.20		0.23	2.97		0.79
Prince Edward Island	**0.98**		**0.66**	0.22		0.23	4.40		2.83
Nova Scotia	**0.38**		-0.10	0.13		0.15	2.83		-0.67
New Brunswick	**0.62**		0.13	0.11		0.19	5.61		0.70
Quebec	**0.45**		-0.40	0.11		0.23	3.95		-1.74
Manitoba	0.34		-0.24	0.20		0.23	1.71		-1.06
Saskatchewan	0.17		**-0.38**	0.14		0.17	1.20		-2.19
Alberta	-0.26		-0.38	0.17		0.20	-1.48		-1.92
British Columbia	-0.14		-0.29	0.19		0.20	-0.71		-1.48
Northern Europe	**0.68**		0.32	0.23		0.26	2.92		1.21
Other Europe	**1.47**		0.54	0.25		0.31	5.98		1.72
US, Latin America	**1.09**		**0.85**	0.24		0.33	4.57		2.57
Asia and other	**1.28**		**0.93**	0.24		0.35	5.43		2.70
Regression Constant	-1.21			0.08			-15.33		
Regression Constant		-1.36	-1.31		0.14	0.16		-9.63	-8.08

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

APPENDIX 1. TABLE 2B: PROBIT ANALYSIS FOR DOCUMENT LITERACY LEVEL 1

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	0.09	0.14	0.13	0.09	0.10	0.10	1.04	1.45	1.32
Regression Constant	-0.78			0.06			-12.14		
AGE (RELATIVE TO 36-45)									
16-25	-0.20	-0.30	-0.26	0.15	0.16	0.17	-1.26	-1.86	-1.51
26-35	0.00	-0.01	0.04	0.14	0.16	0.16	0.03	-0.05	0.23
46-55	**0.37**	0.17	0.16	0.16	0.18	0.17	2.39	0.95	0.94
56-65	**0.99**	0.41	0.38	0.18	0.22	0.22	5.36	1.87	1.71
66 & older	**1.27**	**0.85**	**0.83**	0.13	0.14	0.15	9.48	6.09	5.61
Regression Constant	-1.11			0.11			-10.39		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**2.67**	**2.34**	**2.36**	0.17	0.18	0.18	15.54	12.91	13.18
Completed primary	**1.48**	**1.16**	**1.17**	0.19	0.19	0.19	7.66	6.23	6.17
Some secondary	**0.48**	**0.44**	**0.44**	0.11	0.12	0.12	4.35	3.67	3.57
Non-university post-secondary grad.	**-0.38**	**-0.34**	**-0.43**	0.16	0.17	0.15	-2.32	-2.04	-2.87
University graduate	**-0.64**	**-0.74**	**-0.87**	0.28	0.24	0.24	-2.32	-3.07	-3.71
Years of education (relative to average for level, above)	**-0.20**	**-0.12**	**-0.12**	0.03	0.03	0.03	-5.89	-3.76	-3.64
Regression Constant	-1.14			0.09			-13.19		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	-**0.71**	-0.27	-0.19	0.18	0.23	0.24	-3.97	-1.16	-0.79
French	**0.67**	0.15	0.52	0.12	0.17	0.27	5.46	0.87	1.93
French, learned English, French at home	0.08	-0.02	0.24	0.12	0.13	0.20	0.67	-0.14	1.18
French, English at Home	**0.62**	**0.34**	**0.45**	0.16	0.15	0.17	3.91	2.21	2.63
Both French and English, English at home	**0.81**	0.91	0.90	0.40	0.55	0.50	2.04	1.65	1.82
Both French and English, French at home	-0.38	0.06	0.31	0.40	0.30	0.34	-0.93	0.21	0.91
Not French or English, English or French at home	0.27	-0.04	-0.21	0.14	0.17	0.20	1.92	-0.23	-1.08
Not French or English, first language and at home	**1.25**	**1.05**	**0.56**	0.18	0.21	0.24	6.78	5.05	2.32
Regression Constant	-0.99			0.05			-18.53		
PROVINCE/NATION OF POST-SECONDARY COMPLETION (RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.51**		0.16	0.15		0.19	3.37		0.82
Prince Edward Island	**0.81**		**0.45**	0.22		0.21	3.75		2.15
Nova Scotia	**0.57**		0.19	0.14		0.15	4.05		1.28
New Brunswick	**0.64**		0.09	0.10		0.16	6.14		0.55
Quebec	**0.54**		-0.36	0.11		0.23	4.86		-1.54
Manitoba	0.36		-0.21	0.19		0.20	1.85		-1.02
Saskatchewan	0.26		-0.22	0.14		0.18	1.82		-1.27
Alberta	-0.01		-0.05	0.17		0.17	-0.07		-0.29
British Columbia	-0.08		-0.16	0.18		0.18	-0.46		-0.90
Northern Europe	**0.68**		0.27	0.22		0.25	3.02		1.07
Other Europe	**1.48**		0.54	0.25		0.29	5.97		1.87
US, Latin America	**1.33**		**1.14**	0.23		0.33	5.82		3.48
Asia and other	**1.09**		**0.64**	0.23		0.32	4.64		1.99
Regression Constant	-**1.17**			0.08			-15.44		
Regression Constant		-1.46	-1.48			0.15	0.18	-9.55	-8.42

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

APPENDIX 1. TABLE 2C: PROBIT ANALYSIS FOR QUANTITATIVE LITERACY LEVEL 1

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	0.04	**0.09**	**0.07**	0.09	0.10	0.10	0.42	0.89	0.75
Regression Constant	-0.83			0.07			-12.21		
AGE (RELATIVE TO 36-45)									
16-25	-0.10	-0.15	-0.12	0.15	0.17	0.18	-0.69	-0.89	-0.67
26-35	0.00	-0.02	0.03	0.14	0.16	0.16	-0.02	-0.13	0.17
46-55	0.33	0.06	0.07	0.16	0.19	0.19	2.12	0.33	0.36
56-65	0.94	0.26	0.18	0.19	0.23	0.22	5.07	1.15	0.82
66 & older	**1.27**	**0.76**	**0.71**	0.13	0.16	0.16	9.74	4.69	4.32
Regression Constant	-1.19			0.10			-11.56		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**2.74**	**2.54**	**2.61**	0.16	0.18	0.18	16.96	13.89	14.49
Completed primary	**1.53**	**1.28**	**1.32**	0.19	0.18	0.18	8.10	7.20	7.41
Some secondary	**0.64**	**0.64**	**0.68**	0.12	0.12	0.12	5.55	5.41	5.68
Non-university post-secondary grad.	**-0.26**	-0.23	-0.31	0.17	0.17	0.15	-1.49	-1.33	-2.04
University graduate	**-1.17**	**-1.20**	**-1.22**	0.28	0.31	0.33	-4.16	-3.89	-3.70
Years of education (relative to average for level, above)	**-0.22**	**-0.18**	**-0.18**	0.03	0.04	0.04	-6.40	-4.95	-4.99
Regression Constant	-1.32			0.08			-15.78		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	**-0.83**	-0.50	-0.45	0.18	0.22	0.23	-4.72	-2.26	-1.91
French	**0.54**	-0.14	0.12	0.13	0.17	0.29	4.33	-0.81	0.42
French, learned English, French at home	0.03	-0.15	0.06	0.13	0.14	0.22	0.21	-1.07	0.28
French, English at Home	**0.43**	-0.02	0.10	0.17	0.17	0.19	2.56	-0.11	0.55
Both French and English, English at home	0.16	-0.12	0.01	0.31	0.24	0.25	0.52	-0.49	0.04
Both French and English, French at home	-0.60	-0.34	-0.15	0.41	0.30	0.34	-1.48	-1.14	-0.45
Not French or English, English or French at home	**0.22**	-0.12	-0.33	0.15	0.19	0.22	1.50	-0.62	-1.48
Not French or English, first language and at home	**1.03**	**0.64**	0.23	0.18	0.20	0.25	5.62	3.27	0.96
Regression Constant	**-1.00**			0.05			-18.38		
PROVINCE/NATION OF POST-SECONDARY COMPLETION (RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.65**		0.21	0.19		0.23	3.43		0.92
Prince Edward Island	**0.61**		**0.11**	0.21		0.25	2.85		0.43
Nova Scotia	**0.35**		-0.19	0.13		0.14	2.64		-1.34
New Brunswick	**0.54**		-0.03	0.10		0.16	5.27		-0.20
Quebec	**0.48**		-0.29	0.11		0.26	4.20		-1.12
Manitoba	0.31		-0.28	0.20		0.20	1.58		-1.38
Saskatchewan	0.21		**-0.34**	0.14		0.18	1.46		-1.91
Alberta	0.07		0.03	0.17		0.18	0.41		0.16
British Columbia	-0.13		-0.27	0.19		0.18	-0.69		-1.47
Northern Europe	0.73		0.40	0.22		0.26	3.25		1.50
Other Europe	1.46		0.68	0.24		0.30	5.99		2.27
US, Latin America	**1.28**		**1.14**	0.23		0.33	5.49		3.42
Asia and other	**0.73**		**0.21**	0.23		0.35	3.20		0.59
Regression Constant	**-1.20**			0.07			-16.35		
Regression Constant		-1.49	-1.49		0.15	0.16		-10.21	-9.28

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

Probit regression coefficients can be understood in terms of the normal distribution. For example a coefficient of 0.5, can be thought of as change of one half a standard deviation in the normal distribution.

Magnitude refers to the "size" of an effect. The following is a rough rule of thumb for interpreting the magnitude of probit regression coefficients:

- values under .3 (and below -.3) are generally unimportant;
- values between .3 and .49 are small, but worth looking at;
- values between .5 and .79 are moderately large;
- values of.8 and over are large effects.

The distinction between "magnitude" and "significance" of coefficients is fundamentally important in statistics.

Statistical significance of a result refers to the probability that the relationship observed between variables in a sample occurred purely by chance. In this way, measure of a statistical significance tells us something about the degree to which the result is "true" (in the sense of being "representative of the whole population").

The statistical significance of a regression coefficient is a function of its magnitude and the number of observations. A relatively large coefficient may not be significant if the relevant number of cases is small (say the number with an unusual combination of first language and language used in the home).

For example, in the present case all the regression coefficients are based on the same size IALS sample; however the subgroups being compared are not all the same size. Half the whole sample is found in some of the smaller language groups. As a result, a smaller regression coefficient can be significant for a gender difference (because of sample size) when the same size coefficient is not significant for a language category (because of sample size).

Significance is obtained by divided each regression coefficient by its standard error. The resulting z value, in the third set of columns is significant at .05 (i.e taking a 1 in 20 risk of error) if it is greater than or equal to 1.96 or less than or equal to –1.96. For .01 significance (i.e. taking a 1 in 100 risk of error), substitute 2.58 for

1.96; for .001 significance substitute 3.23 for 1.96. In Appendix tables 2A–C and 3A–C figures statistically significant at the .05 level (i.e. taking a 1 in 20 risk or error) are shown in **bold**.

Each regression coefficient for a set of categories (for example age groups) involves a comparison to an "omitted" category used as the reference. The "degrees of freedom" of a categorical variable is one less than the number of categories. Thus with 6 categories, an observation that is not in the first 5 categories must be in the 6th; if it is in one of the first 5 categories it cannot be in the 6th.

To illustrate the interpretation of these figures, here is a brief discussion of Appendix Table 2A.

- The key age difference is between the 66 and older groups and all the others. In fact, the only statistically significant difference is that one.

- There are big differences between the categories and a very large coefficient for the lowest level of education. The effect of years of schooling shows that people with a given level of education after fewer years of schooling are less likely to be in level 1.

- Controlling for age and education, only people whose first language is not English or French, and who speak a language other than English or French at home, are more likely to be in level 1.

- Controlling for age, education and place of secondary graduation (substituting place of birth for non-secondary graduates), none of the language coefficients is significant, though the overall variation between categories is significant, a seeming contradiction that occurs when one has a number of small coefficients.

- Place of post-secondary education has a statistically significant effect, net of the other variables. The main finding is that non-Europeans schooled outside Canada have lower literacy—which is what makes the language effect disappear, above. Also, there are some small significant effects. The sample is too small to investigate these effects in detail.

Corresponding to the smaller R^2 values for the analysis of Level 2 (versus 3, 4 and 5) the regression coefficients in Appendix tables 3A–C are smaller than the coefficients in Appendix tables 2A–C.

APPENDIX 1. TABLE 3A: PROBIT ANALYSIS FOR PROSE LITERACY LEVEL 2, RELATIVE TO LEVELS 3-5

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	-0.09	**-0.22**	**-0.25**	0.11	0.11	0.11	-0.84	-2.01	-2.26
Regression Constant	-0.40			0.08			-4.74		
AGE (RELATIVE TO 36-45)									
16-25	0.20	-0.03	-0.03	0.13	0.13	0.13	1.59	-0.21	-0.20
26-35	0.26	0.14	0.15	0.17	0.17	0.16	1.50	0.87	0.92
46-55	**0.50**	0.33	0.27	0.18	0.19	0.20	2.72	1.68	1.38
56-65	**0.51**	0.20	0.26	0.19	0.23	0.24	2.64	0.85	1.10
66 & older	**0.95**	**0.84**	**0.86**	0.17	0.17	0.17	5.73	5.05	5.04
Regression Constant	-0.75			0.10			7.30		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**1.49**	**1.39**	**1.26**	0.37	0.42	0.43	4.02	3.32	2.94
Completed primary	0.72	0.59	0.56	0.38	0.33	0.34	1.89	1.78	1.66
Some secondary	**0.33**	**0.31**	**0.30**	0.14	0.14	0.13	2.44	2.26	2.25
Non-university post-secondary grad.	-0.24	-0.24	-0.27	0.16	0.15	0.15	-1.51	-1.59	-1.78
University graduate	**-0.95**	**-1.06**	**-1.23**	0.18	0.17	0.18	-5.25	-6.16	-7.02
Years of education (relative to average for level, above)	**-0.14**	**-0.12**	**-0.11**	0.03	0.03	0.03	-4.10	-3.65	-3.42
Regression Constant	-0.33			0.10			-3.36		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	-0.32	-0.09	-0.09	0.22	0.24	0.24	-1.43	-0.39	-0.37
French	**0.35**	0.19	0.18	0.16	0.17	0.26	2.14	1.09	0.72
French, learned English, French at home	0.00	-0.03	-0.07	0.14	0.16	0.21	0.00	-0.17	-0.35
French, English at Home	0.16	0.12	0.11	0.16	0.16	0.17	0.99	0.77	0.67
Both French and English, English at home	0.68	0.72	0.80	0.41	0.46	0.47	1.65	1.58	1.68
Both French and English, French at home	0.97	1.19	1.18	0.70	0.66	0.67	1.39	1.80	1.78
Not French or English, English or French at home	0.36	0.31	0.12	0.21	0.24	0.27	1.74	1.32	0.44
Not French or English, first language and at home	**1.07**	**1.20**	**0.81**	0.29	0.31	0.32	3.73	3.82	2.50
Regression Constant	-0.56			0.08			-7.29		
PROVINCE/NATION OF POST-SECONDARY COMPLETION(RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.40**		0.17	0.20		0.20	2.06		0.82
Prince Edward Island	0.13		0.11	0.28		0.31	0.49		0.37
Nova Scotia	0.09		-0.15	0.19		0.18	0.47		-0.84
New Brunswick	**0.47**		**0.40**	0.16		0.17	3.04		2.42
Quebec	0.32		0.02	0.16		0.22	1.95		0.09
Manitoba	0.23		-0.08	0.21		0.22	1.07		-0.36
Saskatchewan	0.36		0.11	0.24		0.22	1.50		0.49
Alberta	-0.01		-0.07	0.18		0.19	-0.05		-0.40
British Columbia	0.12		0.07	0.20		0.22	0.60		0.31
Northern Europe	-0.04		-0.32	0.24		0.28	-0.16		-1.16
Other Europe	**0.86**		0.26	0.38		0.40	2.23		0.63
US, Latin America	0.47		0.52	0.34		0.38	1.41		1.37
Asia and other	**1.22**		**1.36**	0.36		0.43	3.45		3.14
Regression Constant	-0.65			0.13			-5.03		
Regression Constant		-0.49	-0.47		0.16	0.19		-3.13	-2.40

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

APPENDIX 1. TABLE 3B: PROBIT ANALYSIS FOR DOCUMENT LITERACY LEVEL 2, RELATIVE TO LEVELS 3-5

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	-0.01	**-0.06**	**-0.07**	0.10	0.10	0.10	-0.06	-0.60	-0.63
Regression Constant	-0.51			0.07			-6.87		
AGE (RELATIVE TO 36-45)									
16-25	0.08	-0.14	-0.14	0.13	0.12	0.12	0.60	-1.15	-1.10
26-35	0.11	0.04	0.05	0.15	0.14	0.14	0.73	0.25	0.38
46-55	**0.30**	0.15	0.15	0.19	0.20	0.20	1.52	0.75	0.75
56-65	**0.54**	0.33	0.37	0.21	0.24	0.25	2.55	1.38	1.49
66 & older	**0.97**	**0.87**	**0.88**	0.17	0.18	0.18	5.75	4.92	4.80
Regression Constant	-0.72			0.11			-6.78		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**1.80**	**1.68**	**1.56**	0.47	0.52	0.47	3.81	3.24	3.32
Completed primary	0.62	0.33	0.34	0.36	0.34	0.35	1.71	0.97	0.96
Some secondary	**0.67**	**0.62**	**0.63**	0.13	0.13	0.13	5.03	4.70	4.77
Non-university post-secondary grad.	-0.21	-0.20	-0.22	0.14	0.14	0.14	-1.53	-1.42	-1.54
University graduate	**-0.58**	**-0.62**	**-0.65**	*0.17*	*0.16*	*0.17*	*-3.50*	*-3.80*	*-3.90*
Years of education (relative to average for level, above)	**-0.17**	**-0.13**	**-0.13**	0.04	0.04	0.04	-4.20	-3.42	-3.26
Regression Constant	-0.52			0.09			-5.55		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	-0.29	-0.05	-0.05	0.29	0.30	0.31	-1.00	-0.16	-0.15
French	**0.38**	0.24	0.23	0.17	0.17	0.25	2.29	1.39	0.91
French, learned English, French at home	0.12	0.15	0.12	0.16	0.15	0.20	0.75	1.02	0.61
French, English at Home	0.09	0.00	0.03	0.16	0.16	0.17	0.59	0.00	0.18
Both French and English, English at home	0.08	-0.02	0.08	0.28	0.30	0.28	0.27	-0.07	0.29
Both French and English, French at home	-0.85	-0.59	-0.60	0.41	0.40	0.44	-2.07	-1.46	-1.37
Not French or English, English or French at home	0.14	0.03	-0.02	0.19	0.22	0.23	0.75	0.15	-0.11
Not French or English, first language and at home	**0.85**	**0.82**	**0.65**	0.28	0.27	0.32	3.07	3.00	2.06
Regression Constant	-0.60			0.07			-9.02		
PROVINCE/NATION OF POST-SECONDARY COMPLETION(RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.55**		0.30	0.22		0.20	2.51		1.47
Prince Edward Island	0.20		0.05	0.30		0.27	0.66		0.20
Nova Scotia	0.07		-0.20	0.17		0.19	0.40		-1.07
New Brunswick	**0.50**		**0.35**	0.14		0.16	3.55		2.15
Quebec	0.35		0.04	0.15		0.22	2.36		0.20
Manitoba	0.10		-0.26	0.21		0.22	0.48		-1.19
Saskatchewan	0.40		0.09	0.24		0.21	1.69		0.41
Alberta	-0.03		-0.06	0.17		0.18	-0.19		-0.34
British Columbia	0.21		0.19	0.19		0.19	1.14		0.96
Northern Europe	0.36		0.07	0.27		0.34	1.33		0.20
Other Europe	**0.75**		0.15	0.39		0.38	1.92		0.39
US, Latin America	0.61		0.67	0.30		0.29	2.05		2.27
Asia and other	**0.94**		**0.44**	0.31		0.39	3.03		1.14
Regression Constant	-0.74			0.11			-6.93		
Regression Constant		-0.66	-0.70		0.14	0.17		-4.76	-4.13

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

APPENDIX 1. TABLE 3C: PROBIT ANALYSIS FOR QUANTITATIVE LITERACY LEVEL 2, RELATIVE TO LEVELS 3-5

	Regression Coefficient			Standard Error of Regression Coefficient			z, for statistical significance		
	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables	Each Variable Alone	All Variables Except Place of Education	All Variables
FEMALE (RELATIVE TO MALE)	0.10	**0.08**	**0.08**	0.10	0.10	0.10	1.04	0.82	0.85
Regression Constant	-0.49			0.07			-6.56		
AGE (RELATIVE TO 36-45)									
16-25	0.27	0.05	0.06	0.14	0.13	0.13	1.99	0.42	0.45
26-35	0.11	0.00	0.02	0.16	0.14	0.14	0.67	0.01	0.12
46-55	**0.62**	0.51	0.53	0.19	0.19	0.19	3.32	2.73	2.83
56-65	**0.35**	0.06	0.11	0.19	0.21	0.21	1.87	0.27	0.51
66 & older	**0.97**	**0.88**	**0.93**	0.16	0.18	0.18	5.86	4.94	5.01
Regression Constant	-0.73			0.11			-6.55		
EDUCATION (RELATIVE TO COMPLETED SECONDARY)									
Primary not completed	**1.65**	**1.46**	**1.30**	0.40	0.40	0.38	4.16	3.67	3.40
Completed primary	0.59	0.36	0.31	0.35	0.31	0.31	1.68	1.17	1.01
Some secondary	**0.54**	**0.49**	**0.50**	0.12	0.12	0.12	4.32	4.00	3.99
Non-university post-secondary grad.	-0.30	-0.34	-0.35	0.15	0.13	0.13	-1.97	-2.54	-2.65
University graduate	**-0.94**	**-1.02**	**-1.06**	0.18	0.16	0.16	-5.07	-6.25	-6.48
Years of education (relative to average for level, above)	**-0.14**	**-0.11**	**-0.10**	0.03	0.03	0.03	-4.08	-3.23	-3.04
Regression Constant	-0.35			0.09			-4.00		
FIRST LANGUAGE (RELATIVE TO ENGLISH)									
English, learned French	-0.52	-0.36	-0.38	0.19	0.18	0.18	-2.78	-1.95	-2.08
French	**0.43**	0.30	0.19	0.16	0.16	0.25	2.69	1.88	0.77
French, learned English, French at home	0.01	0.04	-0.08	0.15	0.15	0.21	0.05	0.28	-0.39
French, English at Home	0.28	0.22	0.17	0.16	0.17	0.18	1.71	1.31	0.95
Both French and English, English at home	0.54	0.58	0.57	0.44	0.48	0.49	1.21	1.20	1.17
Both French and English, French at home	1.08	1.49	1.40	0.71	0.77	0.77	1.53	1.95	1.81
Not French or English, English or French at home	0.51	0.42	0.45	0.20	0.23	0.24	2.56	1.78	1.88
Not French or English, first language and at home	**1.10**	**1.06**	**1.08**	0.24	0.26	0.32	4.53	4.17	3.41
Regression Constant	-0.58			0.07			-8.77		
PROVINCE/NATION OF POST-SECONDARY COMPLETION(RELATIVE TO ONTARIO; PLACE FOR BIRTH FOR LESS EDUCATION)									
Newfoundland	**0.53**		0.35	0.18		0.19	2.86		1.85
Prince Edward Island	0.39		0.23	0.27		0.25	1.42		0.93
Nova Scotia	0.23		-0.01	0.17		0.16	1.36		-0.05
New Brunswick	**0.51**		**0.51**	0.14		0.16	3.80		3.17
Quebec	0.40		0.11	0.15		0.22	2.75		0.53
Manitoba	0.32		0.01	0.20		0.22	1.62		0.03
Saskatchewan	0.35		-0.02	0.23		0.19	1.56		-0.12
Alberta	-0.23		-0.33	0.15		0.17	-1.50		-1.99
British Columbia	0.16		0.05	0.19		0.19	0.82		0.28
Northern Europe	0.07		-0.22	0.25		0.30	0.29		-0.75
Other Europe	**0.81**		-0.13	0.37		0.40	2.20		-0.32
US, Latin America	0.59		0.78	0.30		0.33	1.98		2.40
Asia and other	**0.85**		**0.00**	0.29		0.39	2.89		0.01
Regression Constant	-0.67			0.10			-6.51		
Regression Constant		-0.69	-0.71		0.13	0.16		-5.09	-4.46

Source: Statistics Canada International Adult Literacy Survey 1994; analysis by Michael Ornstein, Institute for Social Research, York University, July 2000

Finally, the estimates of standard errors in Appendix Tables 2A–C and 3A–C account for weighting, but not sample clustering or measurement error; of course, the estimates are unbiased.

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