

Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)



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Standard symbols

The following symbols are used in Statistics Canada publications:

- | | |
|----------------|--|
| . | not available for any reference period |
| .. | not available for a specific reference period |
| ... | not applicable |
| 0 | true zero or a value rounded to zero |
| 0 ^s | value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded |
| ^p | preliminary |
| ^r | revised |
| X | suppressed to meet the confidentiality requirements of the <i>Statistics Act</i> |
| E | use with caution |
| F | too unreliable to be published |
| * | significantly different from reference category ($p < 0.05$) |

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Note of Appreciation

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List of Acronyms

ALL	Adult Literacy and Life Skills Survey
BQ	Background Questionnaire
CAPI	Computer-Assisted Personal Interview
CATI	Computer-Assisted Telephone Interview
CBA	Computer-Based Assessment
CHAID	Chi-Square Automatic Interaction Detection
CMA	Census Metropolitan Area
DIPF	German Institute for International Educational Research
ETS	Educational Testing Service
IALS	International Adult Literacy Survey
IALSS	International Adult Literacy and Skills Survey
ICT	Information and Communication Technologies
IEA	International Association for the Evaluation of Educational Achievement
ISCED	International Standard Classification for Education
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification
NHS	National Household Survey
OECD	Organisation for Economic Co-operation and Development
OLM	Official-Language Minority
PBA	Paper-Based Assessment
PIAAC	Programme for the International Assessment of Adult Competencies
PSE	Postsecondary Education
PS-TRE	Problem Solving in Technology-Rich Environments
PSU	Primary Sampling Units
QC	Quality Control
RHG	Response Homogeneity Groups
ROA	Research Centre for Education and the Labour Market

Executive Summary

This report presents the first results of the Programme for the International Assessment of Adult Competencies (PIAAC), an initiative of OECD. PIAAC provides internationally comparable measures of three skills that are essential to processing information: literacy, numeracy, and problem solving in technology-rich environments (referred to as PS-TRE).

The report provides information about the literacy, numeracy, and PS-TRE skills for the Canadian population aged 16 to 65. It provides results for Canada as a whole, as well as for all the provinces and territories. In addition, it looks at the relationships between skills proficiency and a range of socio-demographic characteristics (e.g., age, gender, level of education) across the entire Canadian population. It also reports on first results on the literacy, numeracy, and PS-TRE skills of Aboriginal populations, immigrants, and official-language minority communities.

Key Findings

Canada in the International Context

- Literacy — Canada ranks at the OECD average in literacy. However, Canada shows a larger proportion of its population at both the highest and lowest levels of literacy.
- Numeracy — Canada ranks below the OECD average in numeracy, and the proportion of Canadians at the lower level is greater than the OECD average.
- PS-TRE — Canada ranks above the OECD average in PS-TRE. Only Sweden exceeds Canada in the proportion of its population at the highest level of proficiency.
- A higher proportion of Canadians engage with information and computer technologies than the OECD average.

Skill Levels and Distributions within Canada

- There are notable variations in scores across provinces and territories, in all three domains.
- Literacy and numeracy scores are highest at ages 25 to 34, and are lower among the older age groups.
- Individuals aged 16 to 34 are found to be the most proficient, in PS-TRE. Despite higher levels of proficiency in PS-TRE among youth (16 to 24), 9% display proficiency at the lowest level in PS-TRE.
- Men have higher numeracy skills than women across the entire PIAAC age spectrum, while, in general, both genders display similar proficiencies in literacy and in PS-TRE.
- Higher education is associated with greater literacy, numeracy and PS-TRE skills, particularly for those with postsecondary education (PSE) – bachelor's degree or higher.
- Proficiencies in information-processing skills of adults with PSE - below a bachelor's degree are below those of adults with PSE - bachelor's degree or higher, and more similar to those of adults with a high school diploma.
- The employed population displays greater information-processing skills than the unemployed and not in the labour force populations.
- Literacy and numeracy skills of unemployed and not in the labour force populations are similar. However, not being in the labour force is associated with lower PS-TRE skills compared to the unemployed population.

- Higher education and working in managerial and professional occupations attenuate the difference in information-processing skills between younger and older age groups. This is especially true among individuals with PSE – bachelor’s degree or higher.
- While workers in managerial and professional occupations display greater information-processing skills than workers in all other types of occupations, workers with the greatest information processing skills are those in managerial and professional occupations who also have PSE – bachelor’s degree or higher.
- On average, initial results indicate that information-processing skills of Aboriginal populations, immigrants, and official-language minority populations vary considerably across provinces and territories and across skills being measured. These results warrant further research that would shed light on how skills vary in relation to other socio-demographic characteristics in these populations.
- A snapshot of literacy and numeracy skills in 2003 and 2012 shows differences in scores and proficiency levels. In 2012, a lower proportion of Canadians are at Level 4 or 5 and a higher proportion at Level 1 or below.

Introduction

Skills and the Information Society

The last three decades have witnessed enormous social, political, and economic change throughout the world. There are many reasons for this, but one of the most important among them is the revolution in computer technology. The processing power of computers has grown at an astonishing rate since 1980, and it continues to accelerate. This in turn has stimulated a rapid drop in the cost of information and communications technologies (ICT), together with a corresponding rise in its availability.

The result has been nothing short of transformative. Where a generation ago computers were seen as complementary or alternative tools for performing certain tasks, today they are viewed as necessities. As a result, ICT is widespread. It is so deeply embedded in modern societies that it is virtually impossible to avoid, and it increasingly shapes our experience of the classroom, the workplace, and even everyday life.

Understanding How Societies Are Adapting

Faced with such thoroughgoing change, societies need to better understand what skills people have, and how those skills are being used. This is more than simply a question of economic well-being. A great deal of discussion has been devoted to the aptitudes a population possesses and their bearing on international competitiveness — and this is a subject of great importance. Yet it must be emphasized that these aptitudes impact a range of factors that extend well beyond the relative economic standing of different countries. They also have profound consequences for such broad domestic considerations as economic disparities between different groups; health outcomes; levels of political engagement; and the degree to which people feel integrated into, or isolated from, society. The skills a country's population possesses do not only foreshadow its future international economic prospects; they also illustrate the challenges it faces, and shape the way in which it adapts to change.

The Key Skills: Literacy, Numeracy, and Problem solving in Technology-Rich Environments

To promote understanding of these challenges, Canada joined the OECD Programme for the International Assessment of Adult Competencies (PIAAC). The programme, which builds on previous international assessments, provides internationally comparable measures of three skills that are essential to processing information: literacy, numeracy, and problem solving in technology-rich environments (referred to in this report as PS-TRE).

Given the centrality of written communication and basic mathematics in virtually all areas of life, coupled with the rapid integration of ICT, individuals must be able to understand, process, and respond to textual and numerical information, print and digital, if they are to participate fully in society — whether as citizens, family members, consumers, or employees. The three skills noted above are considered key to that ability: they provide a foundation for the development of other, higher-order cognitive skills, and are prerequisites for gaining access to, and understanding of, specific domains of knowledge. In addition, they are necessary in a broad range of contexts, from education, to work, to everyday life.

This first pan-Canadian report on PIAAC presents a first look at how these key skills are distributed among Canadians and how these results compare to those of populations in other countries.

Box 1

An International Initiative

The Programme for the International Assessment of Adult Competencies (PIAAC) is a joint education and labour initiative of OECD. The mission of OECD is to promote policies that will improve the economic and social well-being of people around the world.

The design and implementation of PIAAC is the responsibility of an international consortium led by Educational Testing Service (ETS) in the United States. The other partners are Westat (U.S.A.); cApStAn (Belgium); the Research Centre for Education and the Labour Market (ROA) at the University of Maastricht (the Netherlands); and the GESIS-Leibniz Institute for the Social Sciences, the German Institute for International Educational Research (DIPF), and the IEA Data Processing and Research Center (Germany).

Canada is one of 24 countries and sub-national regions that participated in the first round of PIAAC (between August 2011 and June 2012). (A second round of PIAAC will be administered in 2014 in nine additional countries, with results to be released in 2016. These countries are Chile, Greece, Indonesia, Israel, Lithuania, New Zealand, Singapore, Slovenia, and Turkey.)

What is PIAAC?

PIAAC is a highly complex survey of the information-processing skills of youth and adults between the ages of 16 and 65.¹ Canada is one of 24² countries and sub-national regions participating in this initiative. In addition to surveying the entire country, Canada collected data for every province and territory.

Main Elements of PIAAC in Canada

The PIAAC survey is made up of three main parts: a background questionnaire, a direct assessment, and a module on the use of skills.

Background Questionnaire

The PIAAC background questionnaire puts the results of the skills assessments into context, classifying survey participants according to a range of factors that influence the development and maintenance of skills. In particular, the questionnaire facilitates the analysis of skill distribution across socio-demographic variables. It also permits the study of outcomes that could be associated with skills.

The questionnaire is divided into the following sections:

- Demographic characteristics (e.g., age, gender, Aboriginal identity, immigrant status);
- Educational attainment and training (e.g., highest level of education, where and when obtained, field of study);
- Employment status and income (e.g., employed or not, type of work, earnings);
- Social and linguistic background (e.g., self-reported health status, language spoken at home).

1. While the PIAAC survey population covers youth (those aged 16 to 24) and adults, for the sake of simplicity this report will only use the term “adults” while referring to both.

2. Note that at the time of writing, data were not available for France and the Russian Federation. The results in this report therefore include only 22 countries and sub-national regions.

List I.1

Countries and sub-national regions participating in PIAAC, 2012

<u>Countries</u>	<u>Canadian provinces and territories</u>
Australia	Newfoundland and Labrador
Austria	Prince Edward Island
Belgium	Nova Scotia
Canada	New Brunswick
Cyprus	Quebec
Czech Republic	Ontario
Denmark	Manitoba
Estonia	Saskatchewan
Finland	Alberta
France	British Columbia
Germany	Yukon
Ireland	Northwest Territories
Italy	Nunavut
Japan	
Korea	
Netherlands	
Norway	
Poland	
Russian Federation	
Slovak Republic	
Spain	
Sweden	
United Kingdom	
United States	

Direct Assessment of Information Processing Skills

The direct assessment component measures three essential information-processing skills, as defined by PIAAC: literacy, numeracy, and PS-TRE. These skills are the foundational skills of everyday life — at home, school, work, or in the community. It should be noted that they are tested in the official language chosen by respondents (English or French), and thus the results are influenced by the respondent's proficiency in that language.

Each skill is measured along a continuum and within a context of how it is used. To help interpret the results, the continuum has been divided into different levels of proficiency. These do not represent strict demarcations between abilities but instead describe a set of skills that individuals possess to a greater or lesser degree. This means that individuals scoring at lower levels are not precluded from completing tasks at a higher level - they are simply less likely to complete them than individuals scoring at the higher level.

PIAAC recognizes that concepts such as literacy, numeracy, and PS-TRE are too complex and varied to be captured by a single measure. For example, there are multiple forms of literacy, rather than a single one. Its aim, therefore, is not to redefine or simplify such concepts; rather, it is to evaluate a specific, measurable dimension of them. The skills assessed by PIAAC are defined in terms of three parameters: content, cognitive strategies, and context. The content and cognitive strategies for each domain are defined by a specific framework, which describes what is being measured and guides the interpretation of results (OECD 2012). The context defines the different situations in which each of these skills is used, including work, education, personal, and society.

Literacy

Respondents are measured for their ability to engage with written texts (print-based and digital) and thereby participate in society, achieve goals, and develop their knowledge and potential. This requires accessing, identifying, and processing information from a variety of texts that relate to a range of settings.

- PIAAC also includes an assessment of *reading components* designed to provide information about adults with very low levels of proficiency in reading. It measures skills in print vocabulary (matching words with the picture of an object), sentence processing (deciding whether a sentence makes logical sense), and passage comprehension (selecting words that make the most sense in the given context). Results for the assessment of reading components are not presented in this report.

Numeracy

Respondents are measured for their ability to engage with mathematical information in order to manage the mathematical demands of a range of situations in everyday life. This requires understanding mathematical content and ideas (e.g., quantities, numbers, dimensions, relationships), and the representation of that content (e.g., objects, pictures, diagrams, graphs).

PS-TRE

Respondents are measured for their ability to use digital technology, communications tools, and networks to acquire and evaluate information, communicate with others, and perform practical tasks. This requires understanding technology (e.g., hardware, software applications, commands and functions) and solving problems with it. Measurement is divided into two different but related parameters: 1) familiarity with computers and how to use them; and 2) the ability to solve problems commonly encountered in a technology-rich world.

Module on the Use of Skills

The module on the use of skills collects self-reported information on how a range of skills are used at work and in everyday life, including the frequency and intensity of use. It includes information about the use of:

- Cognitive skills, such as engagement in reading, numeracy, and ICT;
- Non-cognitive skills (such as the capacity to work collaboratively or as a member of a team), communications skills, organization and planning skills, and influencing skills;
- Skills in the workplace, such as autonomy over key aspects of work and what kind of skills are employed at work.

This report does not present information or results from the module. Nonetheless, the data collected provide the opportunity for future analysis at a highly detailed level of some important aspects of the labour market, such as the extent and distribution of skills use in the labour market (OECD 2013b).

Placing Results in the Proper Context

While the temptation to make quick comparisons between countries or sub-national regions is understandable, it should be tempered by an understanding of the complexity of the data. A great variety of nations participated in PIAAC, and the populations surveyed began their schooling at any time between the early 1950s and the early 2000s — a half-century that has been marked by enormous change. Consequently, the results are affected by a number of factors that vary by jurisdiction, such as:

- The evolution of education and training systems;
- Changes in education policies;
- The development of regional and national economies;
- Patterns of immigration; and
- Changes in social norms and expectations.

Table I.1
Overview of PIAAC, 2012

	International	Canada
Participating jurisdictions	24 countries and sub-national regions.	10 provinces and three territories.
Population	Non-institutionalized adults 16-65 years of age.	Non-institutionalized adults between the ages of 16 and 65 who reside in Canada at the time of data collection. Excludes on-reserve Aboriginal populations.
Number of participating adults	157,000 respondents.	Approximately 27,285 respondents to provide a representative sample for each of Canada's provinces and territories.
Components	Background Questionnaire (BQ) Assessment domains: <ul style="list-style-type: none"> • Literacy <ul style="list-style-type: none"> - Reading Components (optional) • Numeracy • PS-TRE (optional) Module on Skills Use	Canada Background Questionnaire Assessment domains: <ul style="list-style-type: none"> • Literacy <ul style="list-style-type: none"> - Reading Components • Numeracy • PS-TRE Module on Skills Use
Languages in which the test was administered	34 languages.	English and French.
National options	Other options were undertaken in a limited number of countries.	Canada added a limited number of questions to the Background Questionnaire to collect specific information on languages spoken, secondary school completion, immigration and Aboriginal identity, among others.

The perils of jumping to quick conclusions are well illustrated by the case of Canada, whose national results derive from provincial and territorial ones. In addition to large differences between provinces and territories, there are major differences between populations within them — and these differences can only be understood in a wider context. For example, respondents in Canada were given the test in English or French, yet a portion of the Canadian population has neither as their mother tongue. As a result, the PIAAC scores for these populations are measuring skills in a second language.

Further examples of the differences both between and within provinces and territories include: the socio-demographic composition of their populations; the educational attainment of these populations; the proportion of immigrants in a population; the distribution of residents living in rural areas versus those living in population centres; and the nature of labour markets and local economies. These factors reflect the diversity of the Canadian population, but they inevitably complicate analysis of the results and undermine simple comparisons between jurisdictions.

About this Report

This pan-Canadian report is a companion to OECD's international report on PIAAC, and its purpose is to provide a first look at descriptive statistics from the survey for Canadians.

Chapter 1 provides a descriptive, comparative analysis of the distribution of proficiency in key skills among the populations of Canada's 13 provinces and territories from an international perspective. Chapter 2 explores the relationship between proficiency and factors that influence the development and maintenance of skills in Canada, such as socio-demographic characteristics. This exploration is deepened in Chapter 3, which studies the proficiency of selected populations within Canada. Finally, Chapter 4 provides a snapshot of literacy and numeracy skills in Canada in 2003 and 2012.

Both internationally and within Canada there will be a need to build on what we learn through PIAAC, to help understand the stories behind the numbers. This report, therefore, can be considered as a first look into the PIAAC data. It will be used as a starting point from which to undertake further, deeper analysis, which will be shared over the coming years.

Notes to Readers

Throughout this report charts and tables are employed to convey study results to a broad non-technical audience and to provide a source of informative displays that readers may use for their own purposes. To satisfy the more technical reader data table for all charts is provided in the statistical annex to this report.

Given the comparative nature of the PIAAC study, those responsible for the design of the study and its implementation went to great lengths to establish the validity, reliability, comparability and interpretability of estimates, and to control and quantify errors that might interfere with or bias interpretation. Notes to figures and tables are used to alert readers whenever errors have been detected that might affect interpretation.

The data values presented in this report are estimated from representative but complex samples of adults from each country. Consequently there is a degree of sampling error that must be taken into account. Additionally, there is a degree of error associated with the measurement of skills because they are estimated on the basis of responses to samples of test items. Thus a statistic, called the standard error, is used to express the degree of uncertainty associated with both sampling and measurement error.

When comparing scores among countries, provinces, territories or population subgroups, the degree of error in each average score should be considered in order to determine if the averages really are different from each other. Standard errors and **confidence intervals** may be used as the basis for performing these comparative statistical tests. Such tests can identify, with a known probability, whether there are actual differences in the populations being compared. For example, when an observed difference is significant at the 0.05 level, it implies that the probability is less than 0.05 that the observed difference could have occurred because of sampling and measurement error. When comparing jurisdictions, extensive use is made of this type of test to reduce the likelihood that any spurious differences due to sampling and measurement error be interpreted as real.

Only statistically significant differences at the 0.05 level are noted in this report, unless otherwise stated.

This means that the 95 percent confidence intervals for the averages being compared do not overlap. Due to rounding error, some nonoverlapping confidence intervals share an upper or lower limit. All statistical differences are based on un-rounded data.

Rounding

Data estimates, including mean scores, proportions and standard errors, are generally rounded to one decimal place. Therefore, even if the value (0.0) is shown for standard errors, this does not necessarily imply that the standard error is zero, but that it is smaller than 0.05.

Please also note there may be inconsistencies between the numbers in the tables, charts and text of this report. Numbers presented in tables have been rounded up to or down at the nearest first decimal using data up to two decimal places. Whereas, the numbers shown in the charts have been rounded to the nearest whole number using data at one decimal place. Finally, the numbers presented in this report have been rounded up or down to the nearest whole number based on data up to two decimal places.

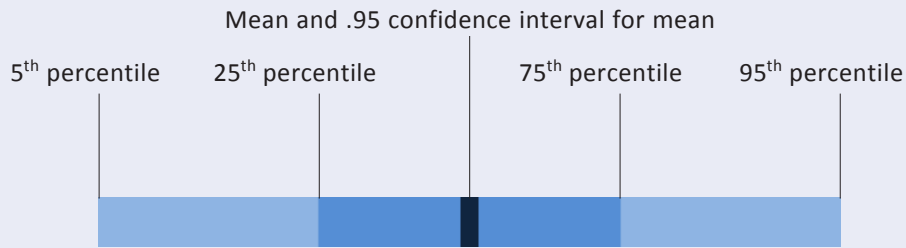
Example of inconsistencies between text, charts and tables:

- Estimation with two decimal places is 4.48;
- Value presented in the tables is 4.5;
- Value presented in the charts is 5;
- Value presented in the text is 4.

Box 2

Means and confidence intervals

Many figures in this report show the population mean scores surrounded by the 95th percent confidence intervals, and the scores at the 5th, 25th, 75th, and 95th percentiles for the domains of literacy and numeracy. The intervals at both ends of the proficiency continuum display the scores for the least and most proficient respondents — the 5th percentile to the lower bound of the distribution and the 95th to the upper bound of the distribution. The middle bar shows the mean and the confidence interval, within which the actual population average is assumed to fall. Moreover, these plots display the width of the distribution of the proficiency. A smaller spread of scores indicates fewer skill differences; a larger spread indicates more skill differences between the higher and lower performers.



Chapter 1

Canada in an International Context

Highlights

- *Canada ranks at the OECD average in literacy, below the OECD average in numeracy, and above the OECD average in PS-TRE.*
- *A high proportion of Canadians engage with ICT compared to the OECD average.*
- *Canada has a higher proportion of its population at the highest proficiency levels in literacy and PS-TRE compared to the OECD average.*
- *Canada has a larger proportion of adults at the lowest proficiency levels in all three domains compared to the OECD average.*

This chapter presents the Canadian results from PIAAC broken down by province and territory, and compared to participating countries and sub-national regions. It provides a first look at PIAAC results for literacy, numeracy, and PS-TRE.

Literacy

For the purposes of PIAAC, literacy is defined as “understanding, evaluating, using and engaging with written texts to participate in society, to achieve one’s goals, and to develop one’s knowledge and potential” (OECD 2012).

The population of adults aged 16-to-65 was assessed over a continuum of ability in literacy using a measurement scale ranging from 0 to 500. In this report, results for literacy are presented as either the average proficiency of the population (“average score”) or as the distribution of the population across proficiency levels. This report presents differences between countries in literacy using the OECD approach, that is to say, using the average score to determine a country’s position relative to the OECD average (see Chart 1.1). Proficiency levels are used to help interpret the findings. OECD has divided reporting scales for literacy into five proficiency levels (with an additional category, “below Level 1”), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms (see Table 1.1). Proficiency levels have a descriptive purpose only (see Chart 1.2).

Canada is at the OECD average in literacy

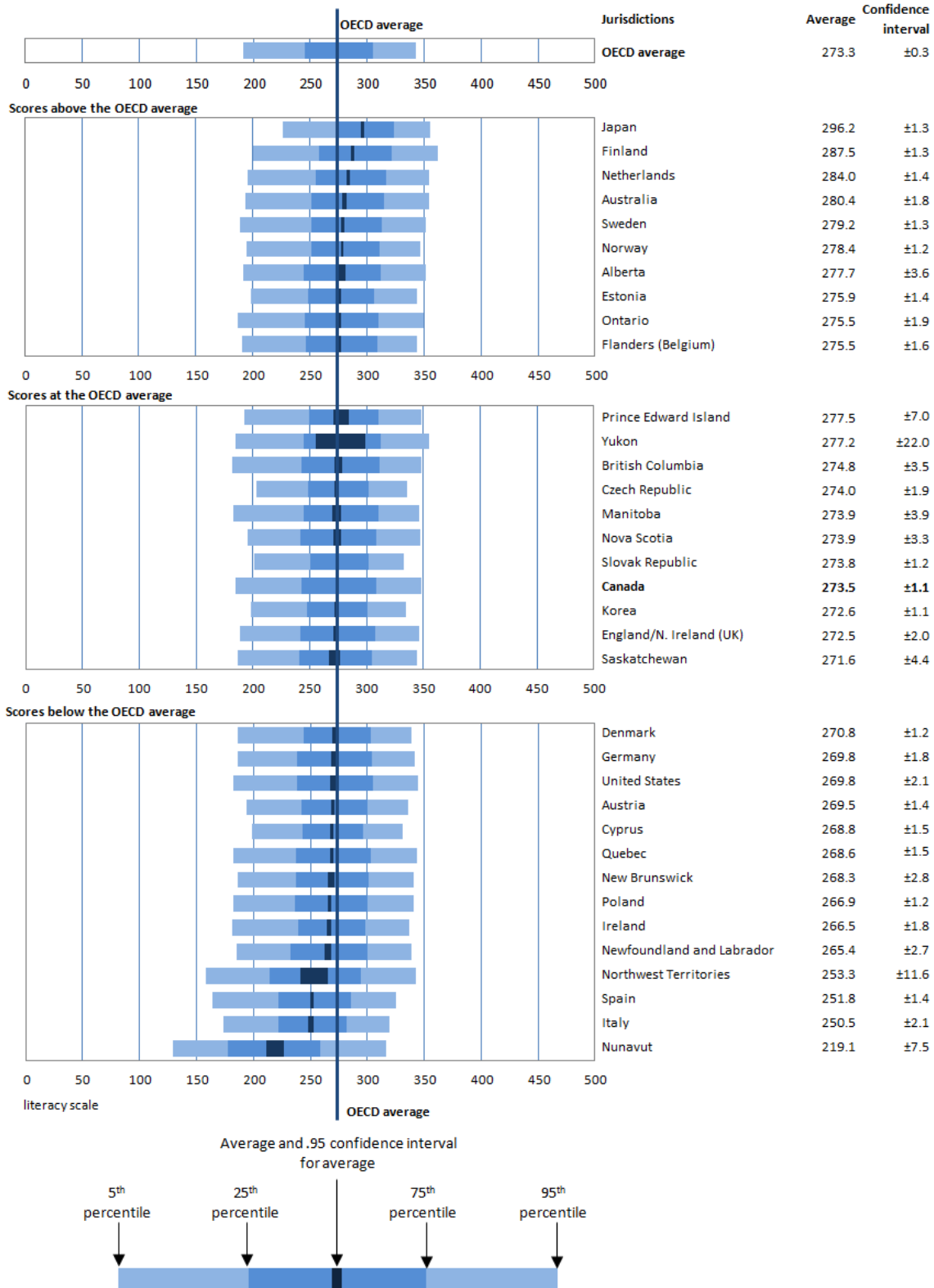
Canadians score at the OECD average of 273 points in literacy. The highest-scoring countries are Japan (296), Finland (288), the Netherlands (284), and Australia (280); countries performing at the same level as Canada include the Czech Republic (274), Korea (273), and the United Kingdom (272); while countries such as Germany (270), the United States (270), and Italy (250) score below the OECD average (Chart 1.1).

Two Canadian provinces — Alberta (278) and Ontario (276) — score above the OECD average in literacy. Six Canadian jurisdictions score at the OECD average, and five are below the average (Chart 1.1).

The OECD average for the variation of scores within each population, as measured by the average score-point difference between the 5th and 95th percentiles, is 151 points. In Canada, the difference is 163 points, and countries with similar trends in variation include Sweden (163 points); Spain, Finland, and the United States (162 points); and Australia (161 points).

Chart 1.1

Literacy — Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, countries, provinces and territories, 2012



Note: Countries, provinces and territories are ranked in descending order of the average score for each panel of the figure.

Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.1.

Canada has a higher proportion of its population at the highest and lowest levels in literacy

Fourteen percent of Canadians score at Level 4 or 5, meaning that they can undertake tasks that involve integrating information across multiple dense texts and reasoning by inference. This places Canada above the OECD average of 12%, along with Japan (23%), Finland (22%), the Netherlands (19%), Australia (17%), and Sweden (16%).

At the other end of the scale, 17% of Canadians score at Level 1 or below. Of these, 13% score at Level 1: these individuals have skills that enable them to undertake tasks of limited complexity, such as locating single pieces of information in short texts in the absence of other distracting information. The remaining 4%, categorized as “below Level 1,” do not command these skills. They demonstrate only basic vocabulary, as well as the ability to read brief texts on familiar topics to locate a single piece of specific information. The OECD average for Level 1 or below is 15%.

Table 1.1
Literacy — Description of proficiency levels

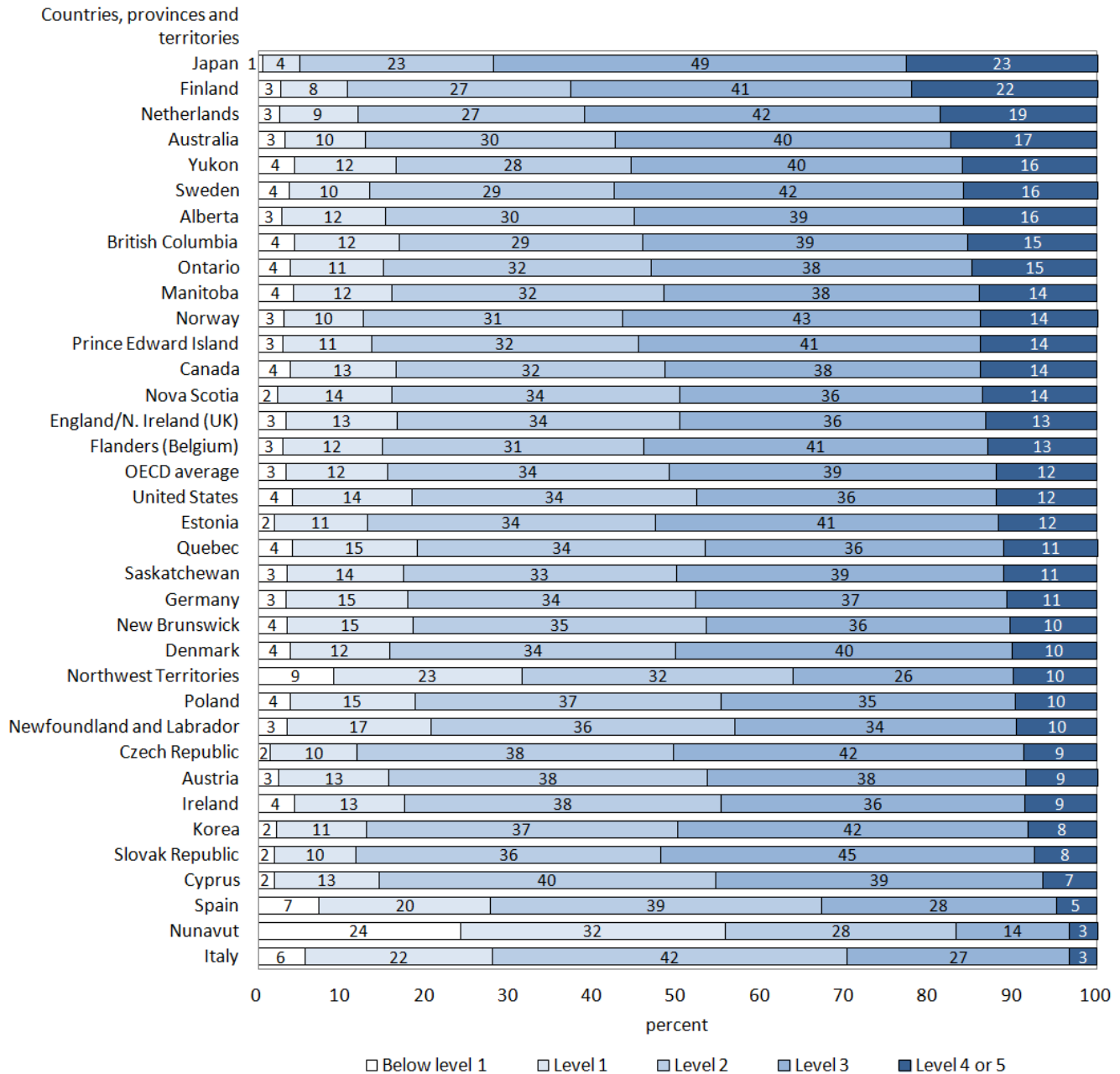
Level	Score range	Percentage of the population aged 16 to 65	Characteristics of literacy tasks
5	376-500	1% of populations across OECD and 1% in Canada can successfully perform tasks at Level 5	At this level, tasks may require the respondent to search for and integrate information across multiple, dense texts; construct syntheses of similar and contrasting ideas or points of view; or evaluate evidenced based arguments. Application and evaluation of logical and conceptual models of ideas may be required to accomplish tasks. Evaluating reliability of evidentiary sources and selecting key information is frequently a key requirement. Tasks often require respondents to be aware of subtle, rhetorical cues and to make high-level inferences or use specialized background knowledge.
4	326-375	12% of populations across OECD and 14% in Canada can successfully perform tasks at least at Level 4 Adults scoring at Level 4: 11% OECD 13% Canada	Tasks at this level often require respondents to perform multiple-step operations to integrate, interpret, or synthesize information from complex or lengthy continuous, non-continuous, mixed, or multiple type texts. Complex inferences and application of background knowledge may be needed to perform successfully. Many tasks require identifying and understanding one or more specific, non-central ideas in the text in order to interpret or evaluate subtle evidence-claim or persuasive discourse relationships. Conditional information is frequently present in tasks at this level and must be taken into consideration by the respondent. Competing information is present and sometimes seemingly as prominent as correct information.
3	276-325	51% of populations across OECD and 51% in Canada can successfully perform tasks at least at Level 3 Adults scoring at Level 3: 39% OECD 38% Canada	Texts at this level are often dense or lengthy, and include continuous, non-continuous, mixed, or multiple pages of text. Understanding text and rhetorical structures become more central to successfully completing tasks, especially navigating of complex digital texts. Tasks require the respondent to identify, interpret, or evaluate one or more pieces of information, and often require varying levels of inference. Many tasks require the respondent to construct meaning across larger chunks of text or perform multi-step operations in order to identify and formulate responses. Often tasks also demand that the respondent disregard irrelevant or inappropriate content to answer accurately. Competing information is often present, but it is not more prominent than the correct information.
2	226-275	85% of populations across OECD and 83% in Canada can successfully perform tasks at least at Level 2 Adults scoring at Level 2: 34% OECD 32% Canada	At this level the medium of texts may be digital or printed, and texts may comprise continuous, non-continuous, or mixed types. Tasks in this level require respondents to make matches between the text and information, and may require paraphrasing or low-level inferences. Some competing pieces of information may be present. Some tasks require the respondent to: <ul style="list-style-type: none"> • cycle through or integrate two or more pieces of information based on criteria • compare and contrast or reason about information requested in the question • navigate within digital texts to access and identify information from various parts of a document.
1	176-225	97% of populations across OECD and 96% in Canada can successfully perform tasks at least at Level 1 Adults scoring at Level 1: 12% OECD 13% Canada	Most of the tasks at this level require the respondent to read relatively short digital or print continuous, non-continuous, or mixed texts to locate a single piece of information that is identical to or synonymous with the information given in the question or directive. Some tasks, such as those involving non-continuous texts, may require the respondent to enter personal information onto a document. Little, if any, competing information is present. Some tasks may require simple cycling through more than one piece of information. Knowledge and skill in recognizing basic vocabulary, determining the meaning of sentences, and reading paragraphs of text is expected.
Below 1	0-175	Adults scoring below Level 1: 3% OECD 4% Canada	The tasks at this level require the respondent to read brief texts on familiar topics to locate a single piece of specific information. There is seldom any competing information in the text and the requested information is identical in form to information in the question or directive. The respondent may be required to locate information in short continuous texts. However, in this case, the information can be located as if the text were non-continuous in format. Only basic vocabulary knowledge is required, and the reader is not required to understand the structure of sentences or paragraphs or make use of other text features. Tasks below Level 1 do not make use of any features specific to digital texts.

Note: The percentages do not add up due to rounding.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Chart 1.2

Literacy — Comparative distributions of proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012



Note: Countries, provinces and territories are ranked in descending order of the percentage of adults at Levels 4 or 5.
Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.2.

Numeracy

PIAAC defines numeracy as “the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life” (OECD 2012). The PIAAC definition is designed to evaluate how mathematical concepts are applied in the real world — not whether someone can solve a set of equations in isolation.

The population of adults aged 16 to 65 was assessed over a continuum of ability in numeracy using a measurement scale ranging from 0 to 500. As is the case for literacy, the results for numeracy are presented either as an average or as a distribution across proficiency levels. Differences between countries are illustrated by comparing their average scores to the OECD average (see Chart 1.3). Reporting scales for numeracy are divided into five proficiency levels (with an additional category, “below Level 1”), defined by a particular score-point range (see Table 1.2). Proficiency levels have a descriptive purpose only (see Chart 1.4).

Canada is below the OECD average in numeracy

Canada’s average score of 265 places it below the OECD average of 269, alongside countries such as Korea (263), the United Kingdom (262) and the United States (253). Among the highest-scoring countries are Japan (288), Finland (282), Sweden (279), and Germany (272). In Canada, all 13 provinces and territories scored either at or below the OECD average (Chart 1.3).

The distribution of scores across each population shows that, on average for participating OECD countries, 166 points separate the 5th and 95th percentiles in numeracy. Canada’s difference is 180 points; countries with similar trends in variation include the United States (188 points), Australia (182 points), and the United Kingdom (178 points).

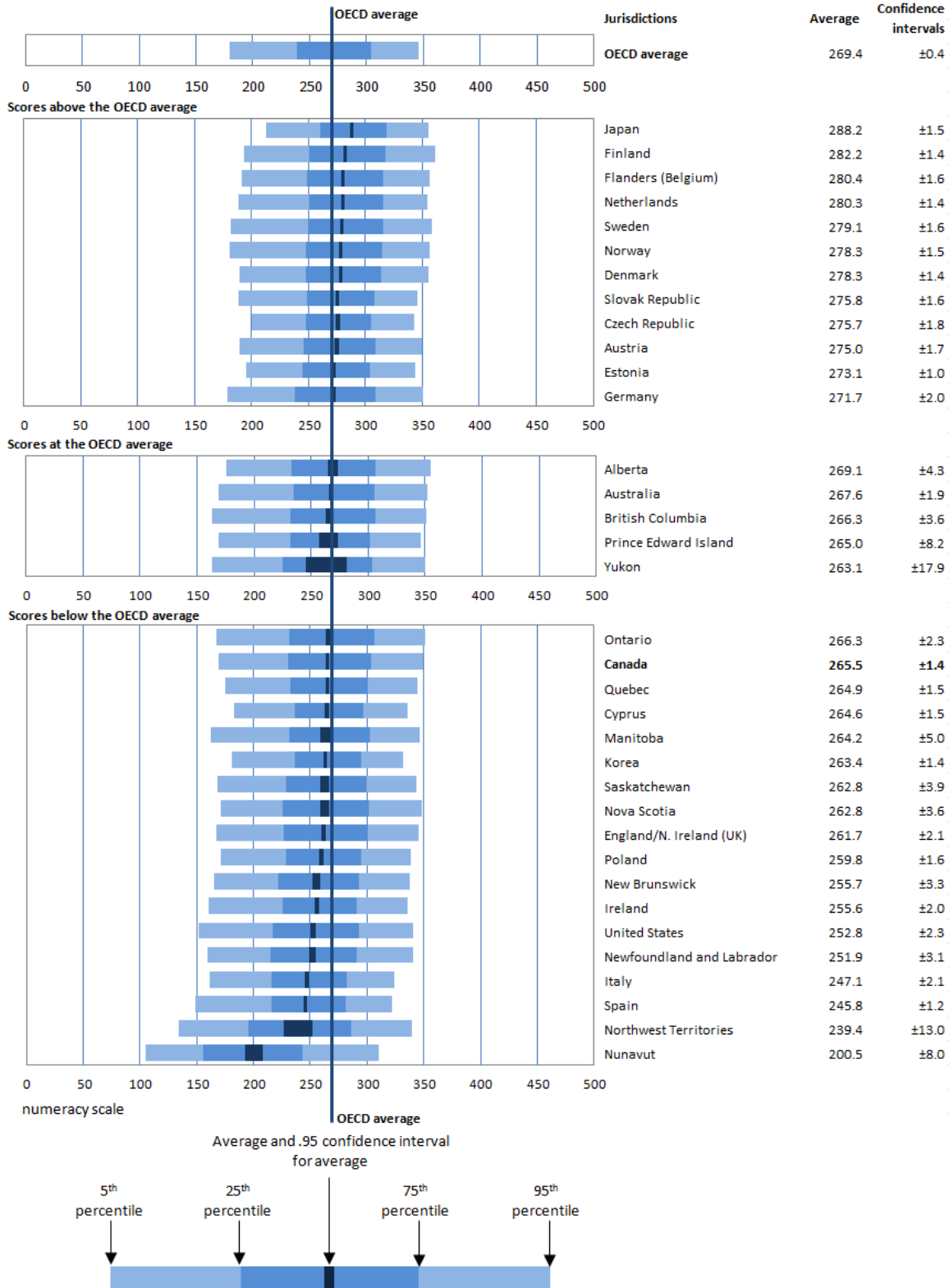
Canada matches the OECD average at the high levels, and exceeds it at the lowest levels

Thirteen percent of Canadians score at Level 4 or 5 in numeracy proficiency, which means they can understand complex mathematical information and work with mathematical arguments and models. This proportion is equal to the OECD average (Chart 1.4).

At the other end of the scale, 23% of Canadians score at Level 1 or below. Of these, 17% score at Level 1, which means that they have the skills to perform simple mathematical operations involving a single step, such as counting or ordering. The remaining 6% are categorized as “below Level 1,” which means they can cope with very simple tasks placed in concrete, familiar contexts where the mathematical content is explicit and requires only simple processes. The OECD average for Level 1 or below is 19%, which means that there are proportionally more Canadians with this degree of proficiency.

Chart 1.3

Numeracy — Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, countries, provinces and territories, 2012



Note: Countries, provinces and territories are ranked in descending order of the average score for each panel of the figure.
Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.3.

Table 1.2

Numeracy — Description of proficiency levels

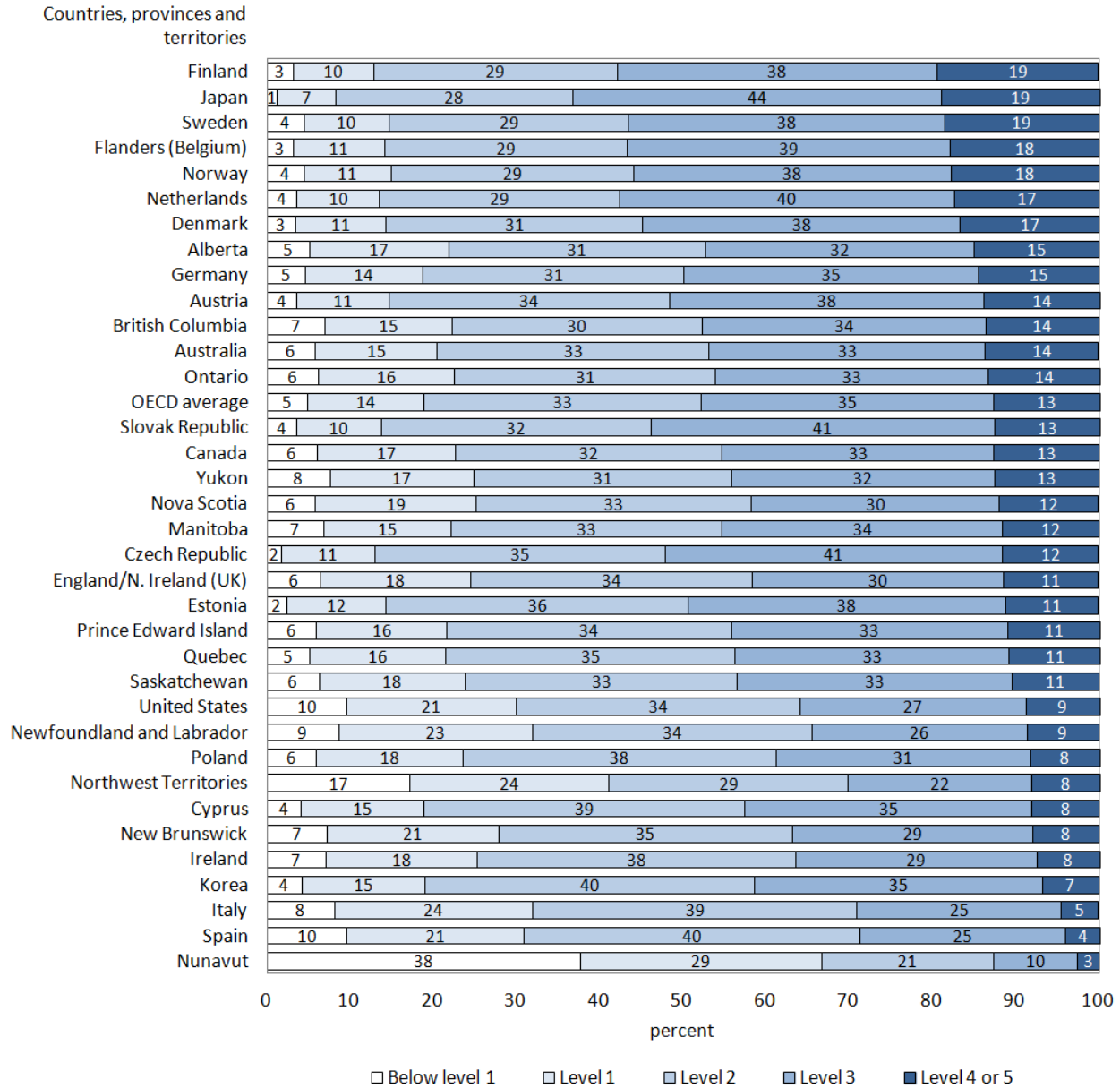
Level	Score range	Percentage of the population aged 16 to 65	Characteristics of numeracy tasks
5	376-500	1% of populations across OECD and 1% in Canada can successfully perform tasks at Level 5	Tasks at this level require the respondent to understand complex representations and abstract and formal mathematical and statistical ideas, possibly embedded in complex texts. Respondents may have to integrate multiple types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and justify, evaluate and critically reflect upon solutions or choices.
4	326-375	13% of populations across OECD and 13% in Canada can successfully perform tasks at least at Level 4 Adults scoring at Level 4: 12% OECD 11% Canada	Tasks at this level require the respondent to understand a broad range of mathematical information that may be complex, abstract or embedded in unfamiliar contexts. These tasks involve undertaking multiple steps and choosing relevant problem-solving strategies and processes. Tasks tend to require analysis and more complex reasoning about quantities and data; statistics and chance; spatial relationships; and change, proportions and formulas. Tasks in this level may also require understanding arguments or communicating well-reasoned explanations for answers or choices.
3	276-325	48% of populations across OECD and 45% in Canada can successfully perform tasks at least at Level 3 Adults scoring at Level 3: 35% OECD 33% Canada	Tasks at this level require the respondent to understand mathematical information that may be less explicit, embedded in contexts that are not always familiar and represented in more complex ways. Tasks require several steps and may involve the choice of problem-solving strategies and relevant processes. Tasks tend to require the application of number sense and spatial sense; recognizing and working with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and interpretation and basic analysis of data and statistics in texts, tables and graphs.
2	226-275	81% of populations across OECD and 77% in Canada can successfully perform tasks at least at Level 2 Adults scoring at Level 2: 33% OECD 32% Canada	Tasks in this level require the respondent to identify and act on mathematical information and ideas embedded in a range of common contexts where the mathematical content is fairly explicit or visual with relatively few distractors. Tasks tend to require the application of two or more steps or processes involving calculation with whole numbers and common decimals, percents and fractions; simple measurement and spatial representation; estimation; and interpretation of relatively simple data and statistics in texts, tables and graphs.
1	176-225	95% of populations across OECD and 94% in Canada can successfully perform tasks at least at Level 1 Adults scoring at Level 1: 14% OECD 17% Canada	Tasks at this level require the respondent to carry out basic mathematical processes in common, concrete contexts where the mathematical content is explicit with little text and minimal distractors. Tasks usually require simple one-step or simple processes involving counting; sorting; performing basic arithmetic operations; understanding simple percents such as 50%; or locating, identifying and using elements of simple or common graphical or spatial representations.
Below 1	0-175	Adults scoring at below Level 1: 5% OECD 6% Canada	Tasks at this level require the respondents to carry out simple processes such as counting, sorting, performing basic arithmetic operations with whole numbers or money, or recognizing common spatial representations in concrete, familiar contexts where the mathematical content is explicit with little or no text or distractors.

Note: The percentages do not add up due to rounding.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Chart 1.4

Numeracy — Comparative distributions of proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012



Note: Countries, provinces and territories are ranked in descending order of the percentage of adults at Levels 4 or 5.

Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.4.

Problem solving in technology-rich environments (PS-TRE)

PIAAC defines PS-TRE as the ability to use “digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks” (OECD 2012). The assessment focuses on “the ability to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, as well as accessing and making use of information through computers and computer networks.” The aim was not to test the use of ICT tools (e.g., hardware devices, software applications) in isolation; rather, it was to assess the capacity to use these tools to complete concrete tasks effectively.

The PS-TRE measure is unique in incorporating digital technology in the solution of problems. It demands that respondents engage with ICT to perform information-processing tasks, and as a result only those who complete the computer-based version of PIAAC (referred to as the computer-based assessment [CBA]) can be assessed for PS-TRE. Those who did not complete it are referred to as ‘PS-TRE non-respondents’.

The use of ICT

A high proportion of Canadians engage with ICT compared to the OECD average

With 81% of its population participating in the CBA, Canada is above the OECD average of 74%. The proportion of those who completed the computer-based version of PIAAC varies from 88% in Sweden to 44% in Cyprus. Almost all provinces and territories were at or above the OECD average (Chart 1.5).

In total, 19% of Canadians were not assessed using CBA. Of this group, 10% were not assessed because they either had no experience with computers (4%), or they failed the test of their basic computer skills, referred to as “ICT core skills” (6%).³ Of the remaining 8%, a total of 6% opted out of the computer-based assessment in favour of the paper-based version, even though they reported having experience with computers; and 2% were classified as “PIAAC non-respondents.”⁴ Nothing can be concluded about the abilities of this 8% concerning the use of ICT or their ability to solve problems in technology-rich environments.

Further study is needed to compare the socio-demographic characteristics of those who were assessed using the CBA with those who were not to consider whether they are different, and to determine what, if any, implications this has for our understanding of the skills of Canadians in PS-TRE. Preliminary analysis suggests that age, educational attainment, and labour force status, as well as proficiency in literacy and numeracy, could all provide further insights.

Performance in PS-TRE

The population of adults aged 16 to 65 was assessed over a continuum of ability in PS-TRE using a measurement scale ranging from 0 to 500. A prerequisite for displaying proficiency in PS-TRE was the completion of the computer-based version of PIAAC, and it must be noted here that the levels of completion varied considerably across countries (see Chart 1.5). As a result, the estimates of proficiency in this domain refer to very different proportions of the populations. For this reason, the presentation of results for PS-TRE focuses on the proportions of the population by proficiency levels rather than the comparison of average scores, to take into account the proportions of the populations who do not have a score for PS-TRE.

OECD has divided reporting scales for PS-TRE into three proficiency levels (with an additional category, “below Level 1”), defined by a particular score-point range, where each level corresponds to a description of what adults with particular scores can do in concrete terms (see Table 1.3). This report presents differences between countries in PS-TRE using the OECD approach, that is to say, the percentage of 16-to-65 year olds scoring at Levels 2 and 3 are combined to determine a country’s position relative to the OECD average (see Chart 1.6).

3. Slight differences are due to rounding.

4. For definitions of all these groups, see the glossary.

Canada is above the OECD average in PS-TRE

Thirty-seven percent of Canadians surveyed score at Level 2 or 3 on the PS-TRE scale, which is above the OECD average of 34%. Other countries scoring above the OECD average include Sweden (44%), the Netherlands (44%), Finland (42%), Norway (41%), and Australia (38%). Countries scoring below the OECD average include the United States (31%), Korea (30%), and Ireland (25%). All provinces and territories, with the exception of Nunavut (11%), and Newfoundland and Labrador (29%) score at or above the OECD average.

Canada has higher proportion of its population at the highest and lowest levels in PS-TRE

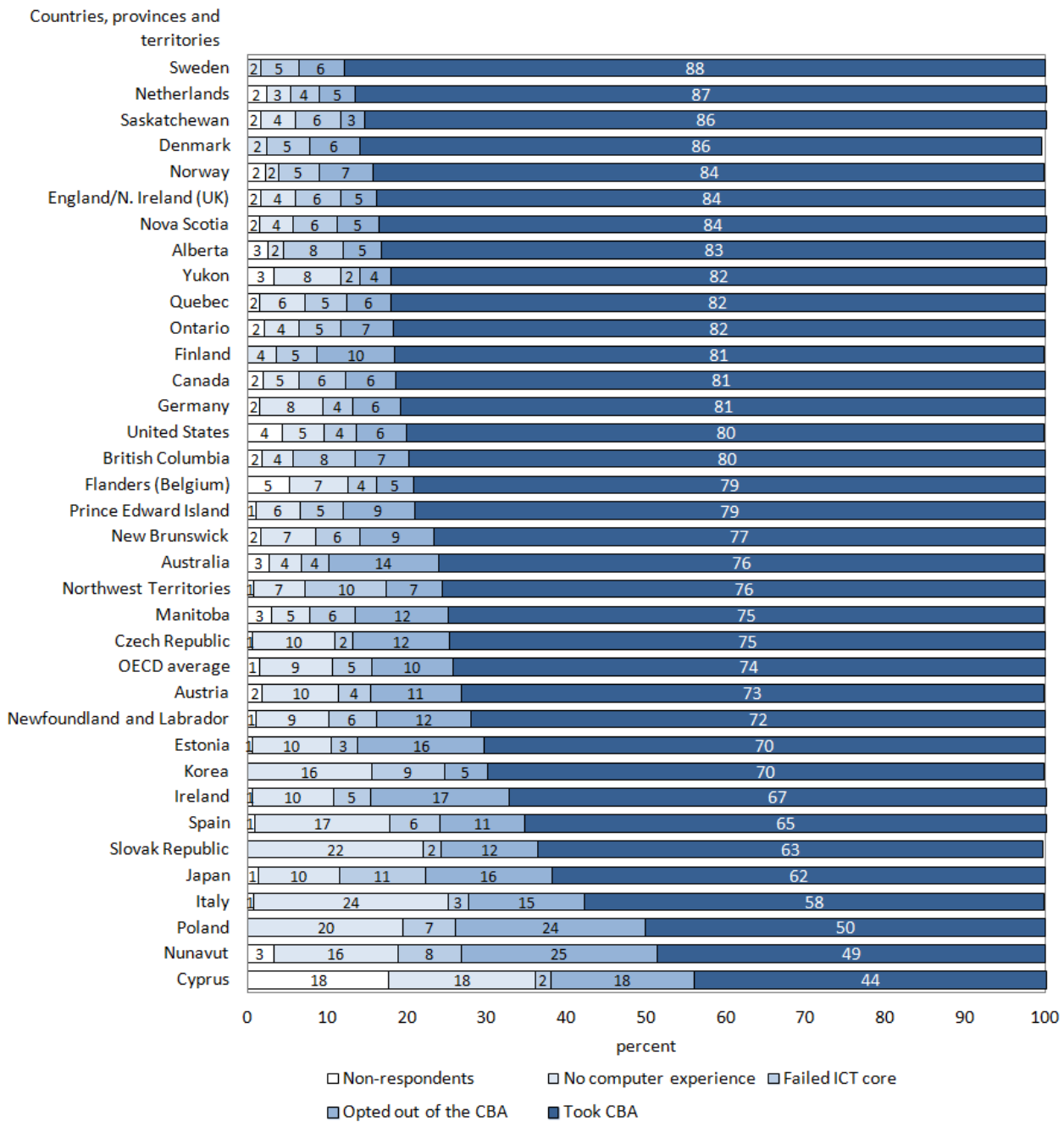
Seven percent of Canadians perform at Level 3, meaning they can complete tasks involving multiple applications and a large number of steps in an environment that may be unfamiliar, and they can establish a plan to arrive at a solution as they deal with unexpected outcomes and impasses. At this level, Canada is above the OECD average of 6%, exceeded only by Sweden (9%).

On the other hand, 15% of Canadians are categorized as “below Level 1,” which is more than the OECD average of 12%. These individuals display the requisite ICT abilities for undertaking the test, but in their abilities to solve problems they fall short of Level 1. Thirty percent of Canadians perform at Level 1, meaning that they can solve problems that have an explicitly stated goal, and that involve a relatively small number of steps to be completed in familiar environment. The OECD average for the proportion of the population at Level 1 is 29%, which is not significantly different from Canada.

This first look at Canada’s PIAAC results for literacy, numeracy, and problem solving in technology-rich environments identifies some initial areas for further analysis, both among provinces and territories in Canada, and globally among countries. One of the first steps to a better understanding of the results for Canada is explored in Chapter 2, where results are presented in terms of the relationships between proficiency and socio-demographic characteristics.

Chart 1.5

Proportion of population aged 16 to 65 by the mode of test administration, countries, provinces and territories, 2012



Note: Countries, provinces and territories are ranked in descending order of the percentage of adults who took CBA.
Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.5.

Table 1.3
PS-TRE — Description of proficiency levels

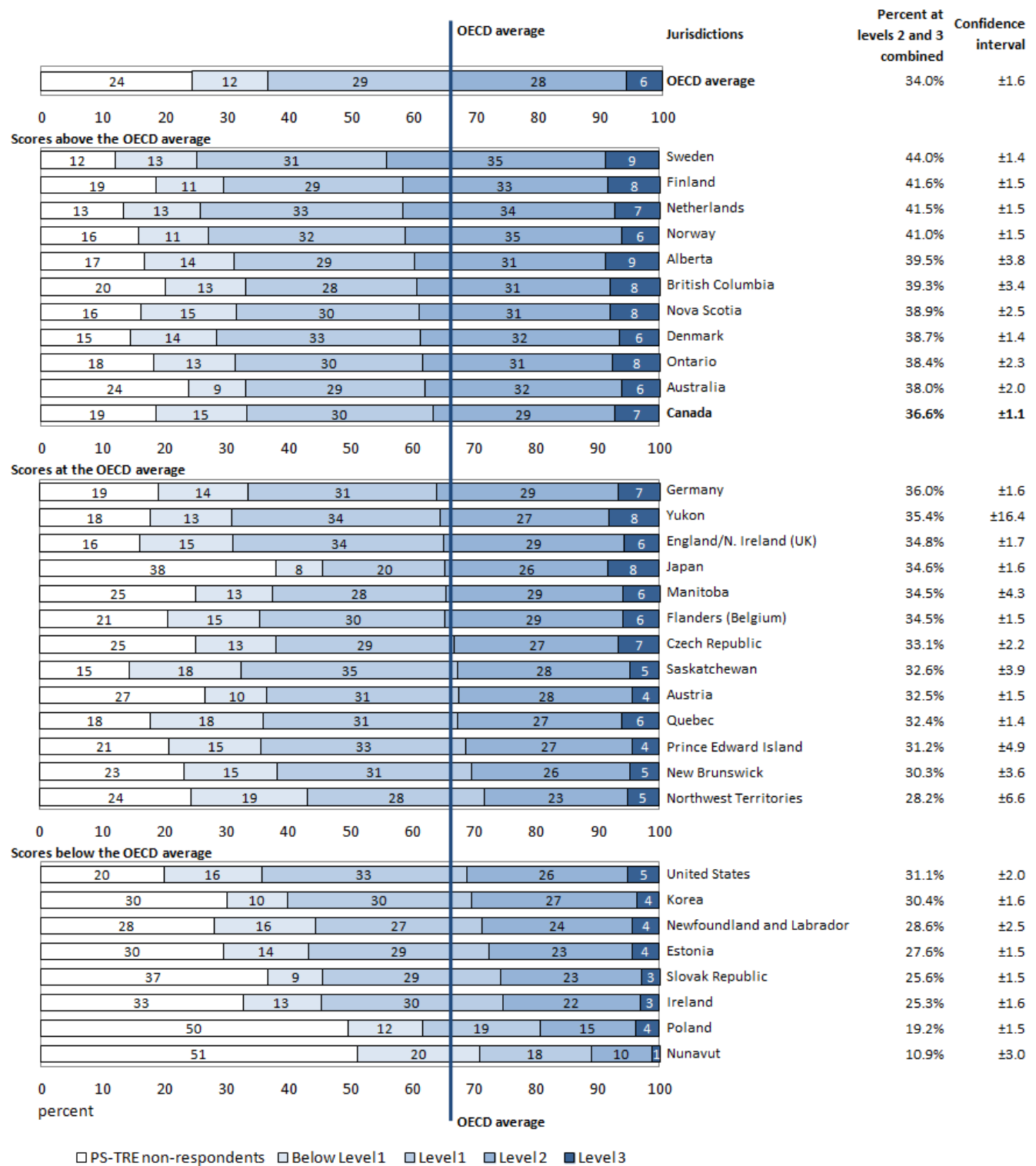
Level	Score range	Percentage of the population aged 16 to 65	Characteristics of PS-TRE tasks
3	341-500	6% of populations across OECD and 7% in Canada can successfully perform tasks at Level 3	At this level, tasks typically require the use of both generic and more specific technology applications. Some navigation across pages and applications is required to solve the problem. The use of tools (e.g., a sort function) is needed to make progress towards the solution. The task may involve multiple steps and operators. The goal of the problem may have to be defined by the respondent, and the criteria to be met may or may not be explicit. There are typically high monitoring demands. Unexpected outcomes and impasses are likely to occur. The task may require evaluating the relevance and reliability of information in order to discard distractors. Integration and inferential reasoning may be needed to a large extent.
2	291-340	34% of populations across OECD and 37% in Canada can successfully perform tasks at least at Level 2 Adults scoring at Level 2: 28% OECD 29% Canada	At this level, tasks typically require the use of both generic and specific technology applications. For instance, respondents may have to make use of a novel online form. Some navigation across pages and applications is required to solve the problem. The use of tools (e.g., a sort function) can facilitate resolution of the problem. The task may involve multiple steps and operators. The goal of the problem may have to be defined by the respondent, though the criteria to be met are explicit. There are higher monitoring demands. Some unexpected outcomes or impasses may appear. The task may require evaluating the relevance of a set of items to discard distractors. Some integration and inferential reasoning may be needed.
1	241-290	63% of populations across OECD and 67% in Canada can successfully perform tasks at least at Level 1 Adults scoring at Level 1: 29% OECD 30% Canada	At this level, tasks typically require the use of widely available and familiar technology applications, such as e-mail software or a web browser. There is little or no navigation required to access to the information or commands required to solve the problem. The problem may be solved regardless of respondents' awareness and use of specific tools and functions (e.g., a sort function). The tasks involve few steps and a minimal number of operators. At the cognitive level, the respondent can readily infer the goal from the task statement; problem resolution requires the respondent to apply explicit criteria; and there are few monitoring demands (e.g. the respondent do not have to check whether he or she has used the appropriate procedure or made progress towards the solution). Identifying contents and operators can be done through simple match. Only simple forms of reasoning, such as assigning items to categories, are required; there is no need to contrast or integrate information.
Below 1	0-240	Adults scoring below Level 1: 12% OECD 15% Canada	Tasks are based on well-defined problems involving the use of only one function within a generic interface to meet one explicit criterion without any categorical, inferential reasoning or transforming of information. Few steps are required and no sub goal has to be generated.
PS-TRE non-respondents		24% OECD 19% Canada	This category includes those individuals who did not report previous computer experience, did not pass the ICT core test, or opted not to be assessed by a computer-based test.

Note: The percentages do not add up due to rounding.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Chart 1.6

PS-TRE — Proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012



Notes: Countries, provinces and territories are ranked in descending order of adults at Level 2 and 3 for each panel of the figure.

Cyprus, Italy, and Spain did not participate in PS-TRE.

Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.1.6.

Chapter 2

Socio-Demographic Characteristics

Highlights

- *Literacy and numeracy scores are highest at ages 25 to 34. Individuals aged 16 to 34 are the most proficient in PS-TRE. Despite higher levels of proficiency in PS-TRE among youth (16 to 24), 9% display proficiency only at the lowest level in PS-TRE.*
- *Women and men display similar proficiencies in literacy and in PS-TRE; men have higher numeracy skills than women.*
- *Higher education is associated with greater literacy, numeracy, and PS-TRE skills.*
- *The employed population displays greater information-processing skills than the unemployed and not in the labour force populations. Workers in managerial and professional occupations display greater information-processing skills than workers in other types of occupations.*
- *Literacy and numeracy skills of unemployed and not in the labour force populations are similar. However, not being in the labour force is associated with lower PS-TRE skills compared to the unemployed.*
- *The difference in information-processing skills between younger and older age groups is narrower for those with higher education or working in managerial and professional occupations. This is especially true among individuals with a bachelor's degree or higher.*

To gain a better understanding of information-processing aptitudes in Canada, this chapter presents the level and distribution of skills across selected socio-demographic characteristics. Drawing on previous works on the relationships between skills and various attributes, the following factors were chosen for closer analysis:

- **Age** — comparing skill differences between age cohorts allows for an analysis of the multifaceted relationship between age and abilities (Statistics Canada 2005).
- **Gender** — previous skill surveys have found that gender is a determinant of skills proficiency, specifically that men's higher proficiency in numeracy is greater in older age cohorts (Statistics Canada 2005; OECD and Statistics Canada 2011).
- **Education** — there is a well-founded and strong link between education and proficiency in skills (Desjardins 2004; Statistics Canada 2005; OECD and Statistics Canada 2005).
- **Labour market** — higher information-processing skills (specifically literacy and numeracy) have been shown to have a positive impact on labour market outcomes such as employment (Statistics Canada 2005) and earnings (Green and Riddell 2007).

Information presented in this chapter focuses only on results for Canada. It presents the relationships at the national level between the above-mentioned socio-demographic attributes and skill levels in literacy, numeracy, and PS-TRE.

Age

The following section highlights key PIAAC findings in Canada on the relationship between age and skills by analyzing results in literacy, numeracy and PS-TRE by age group.

The distribution of Canada's population of 16-to-65 year olds is as follows: 17% for the 16-to-24 age group; 20% for the 25-to-34 age group; 20% for the 35-to-44 age group; 23% for the 45-to-54 age group; and 21% for the 55-to-65 age group.

Literacy and numeracy skills are highest at ages 25 to 34

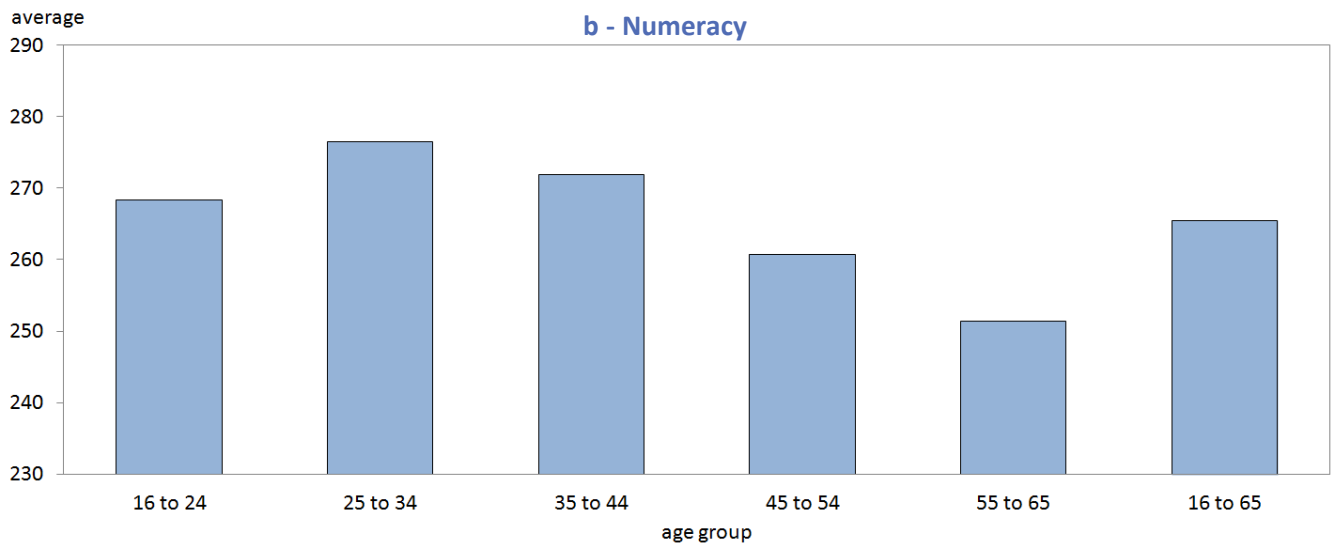
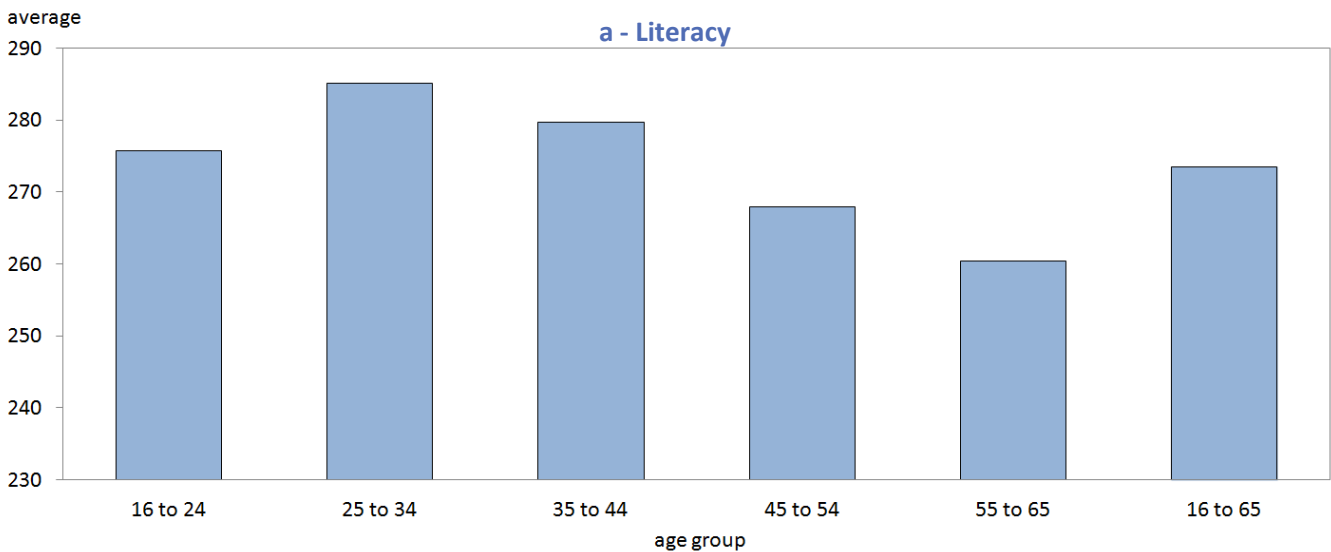
As is the case with most participating countries, literacy and numeracy scores in Canada are highest among the 25-to-34 age group: the average score for literacy is 285, and for numeracy it is 277 (Charts 2.1 a and b). The average score for ages 16 to 24 (when many young people are in school) is 276 for literacy and 268 for numeracy, while the figures for those aged 55 to 65 are lower: 260 for literacy and 251 for numeracy.

PS-TRE is higher among younger age groups. Despite a higher level of proficiency, 9% of youth score at the lowest level

Youth and adults aged 16 to 24 and 25 to 34 are the most proficient in PS-TRE skills, with similar proportions of each age group scoring at Level 2 or 3: 52% of the 16-to-24 age group and 50% of the 25-to-34 age group.

Chart 2.1

Average skills of population aged 16 to 65, by age group, Canada, 2012



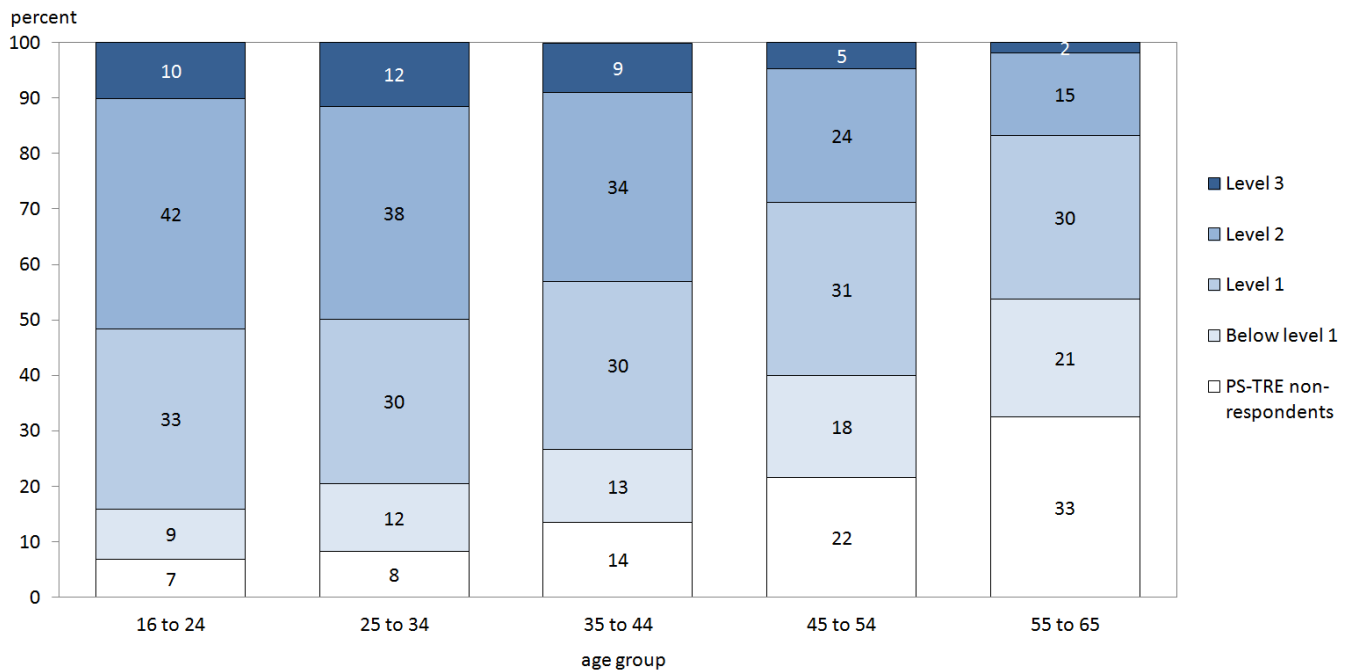
Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.1.

In contrast, those aged 45 to 54 (29%) and 55 to 65 (17%) have lower proficiency in PS-TRE. Despite a higher level of proficiency among youth (16 to 24), 9% score below Level 1 (Chart 2.2).

Non-completion of the PS-TRE assessment is also related to age: one-fifth (22%) of the 45-to-54 age group and one-third (33%) of the 55-to-65 age group were not assessed, compared to 7% of the 16-to-24 age group, and 8% of the 25-to-34 age group.

Chart 2.2

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by age group, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.2.

Gender

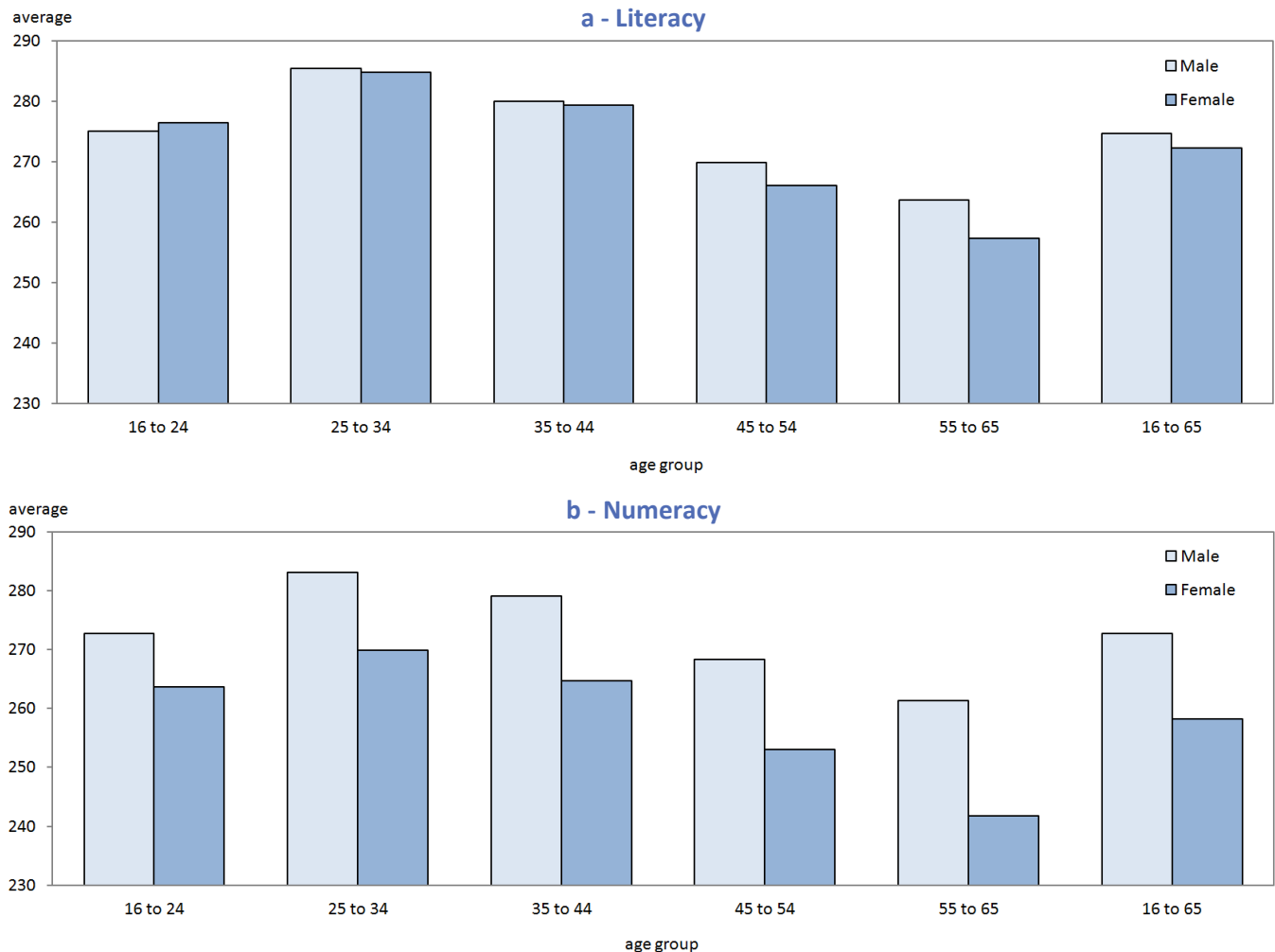
The only skills difference observed between men and women is in the domain of numeracy

Overall, no gender differences were observed at the national level in literacy and PS-TRE skills. This remains true at all age levels, except for the 55-to-65 age group. Among 55-to-65 year olds, men score six points higher than women in literacy (Chart 2.3a) and a larger proportion of men in this age group scored at Level 2 or 3 in PS-TRE (19%) than women (14%).

The picture for numeracy, however, is quite different. Across the full age spectrum, men have measurably higher average numeracy skills than women, and this difference becomes more pronounced in older age groups (Chart 2.3b). For example, in the 16-to-24 cohort, average numeracy scores are 273 for men and 264 for women, a nine-point difference. In the 55-to-65 age group, however, the difference is more than twice as large, with an average score of 261 for men and 242 for women.

Chart 2.3

Average skills of population aged 16 to 65, by gender and age group, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.3.

Education

In this section, skills are presented by the highest level of education completed, which are grouped into four categories: less than high school diploma; high school diploma; postsecondary education below a bachelor’s degree (PSE – below bachelor’s degree); and postsecondary education with a bachelor’s degree or higher (PSE – bachelor’s degree or higher).

The distribution of Canada’s population of 16-to-65 year olds among these educational attainment categories is as follows: 15% have less than a high school diploma; 25% have a high school diploma; 35% have a PSE – below bachelor’s degree; and 26% have a PSE – bachelor’s degree or higher. Note that many (51%) of the young adults (16 to 24 age group) were students when they were interviewed for PIAAC⁵.

5. This proportion drops substantially in the older ages of the cohort: from 50% at age 21, to 32% at ages 22 and 23, and to 15% by age 24.

Educational attainment has a strong positive relationship to skills proficiency

In looking at the population of 16-to-65 year olds, higher levels of education are associated with higher proficiency in literacy (Chart 2.4a), numeracy (Chart 2.4b), and PS-TRE (Chart 2.5), where scores increase with each level of education. For literacy, for example, the average scores for the Canadian population when listed by level of education appear as follows:

- PSE – bachelor’s degree or higher: 300;
- PSE – below bachelor’s degree: 276;
- High school diploma: 267;
- Less than a high school diploma: 234.

The trends in numeracy follow a similar pattern, with the highest average (at 295) for those with a PSE – bachelor’s degree or higher, and the lowest (at 222) for those who have not graduated from high school.

When considering the distribution of groups by proficiency level, those with higher levels of education include greater proportions scoring at the highest proficiency levels. For example, among the population with a PSE – bachelor’s degree or higher, 29% are at Level 4 or 5 in literacy; 27% are at Level 4 or 5 in numeracy; and 13% are at Level 3 in PS-TRE. As the accompanying charts show, these proportions decrease with decreasing levels of education, with about 2-3% of those with less than a high school diploma scoring at the highest level in literacy, numeracy, and PS-TRE.

Conversely, when looking at proficiency at Level 1 or below, the opposite trend is observed: 41% of those with less than a high school diploma are at Level 1 or below in literacy; 51% are at this level in numeracy; and 22% are categorized as below Level 1 for PS-TRE. While these proportions decrease with higher levels of education, about 6-10% of people with PSE – bachelor’s degree or higher are scoring at the lowest level of proficiency in literacy, numeracy (Level 1 or below), and PS-TRE (below Level 1).

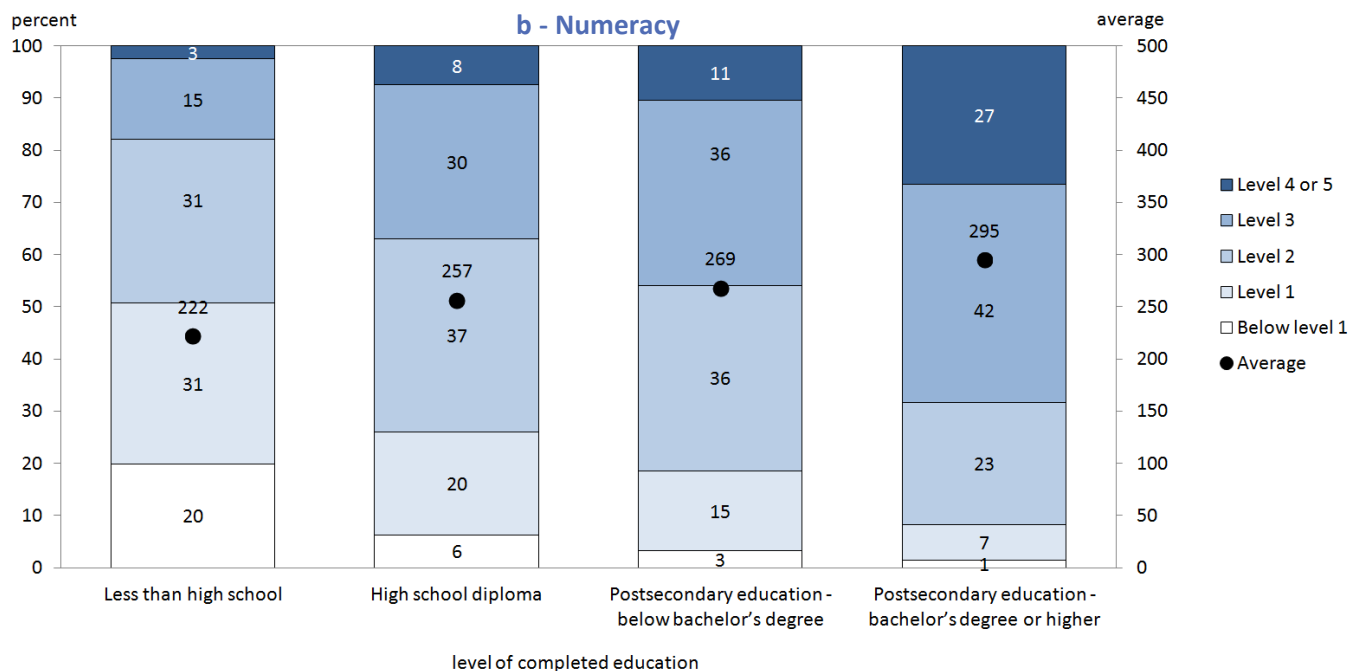
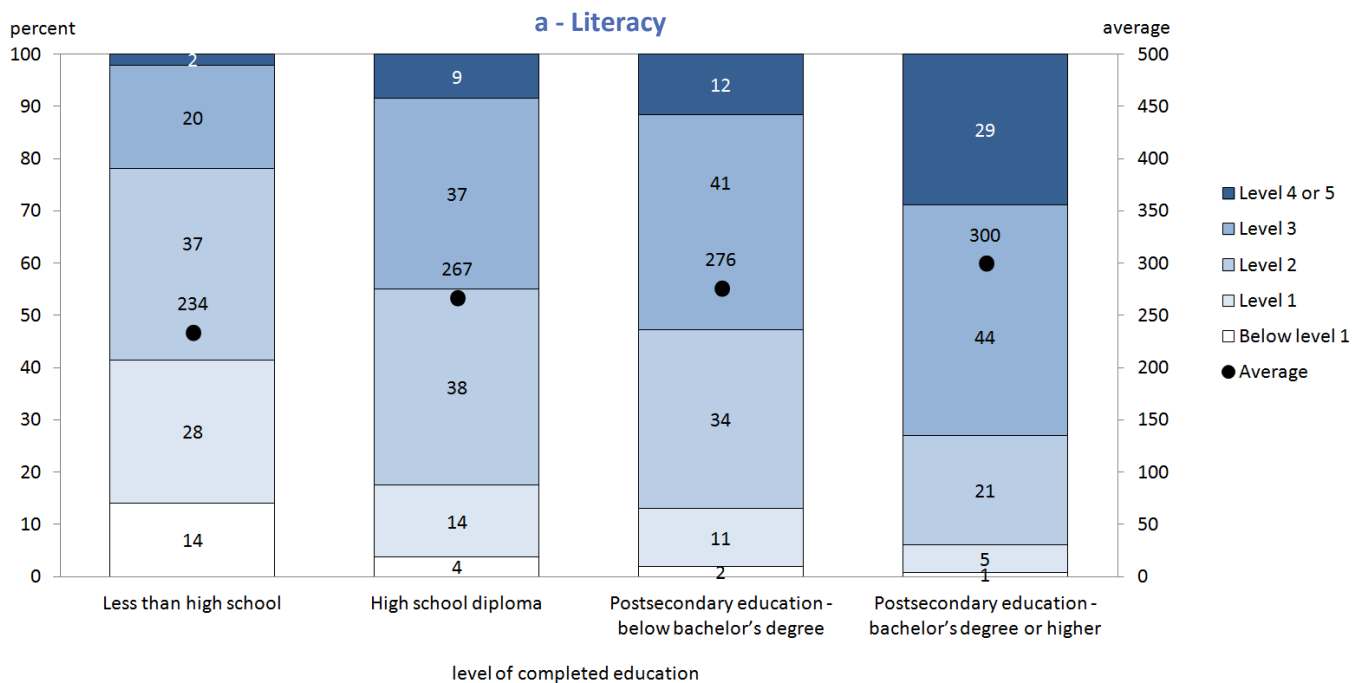
It is also worth noting that even if proficiency levels increase with each level of education, occasionally people with a high school diploma and those with PSE – below a bachelor’s degree demonstrate a similar performance. For example, 9% and 12% respectively score at Level 4 or 5 in literacy. Also, in both groups 6% score at Level 3 in PS-TRE.

When looking at the proportions of people who did not complete the CBA, 34% of people with less than a high school diploma were PS-TRE non-respondents, compared to 9% of people with PSE – bachelor’s degree or higher.

While overall higher levels of education are associated with higher levels of skills, the results above indicate that a certain proportion of those with higher levels of education score at the lowest skill levels, and some with lower levels of education are performing at the highest skill levels. This finding will be further explored in future analysis.

Chart 2.4

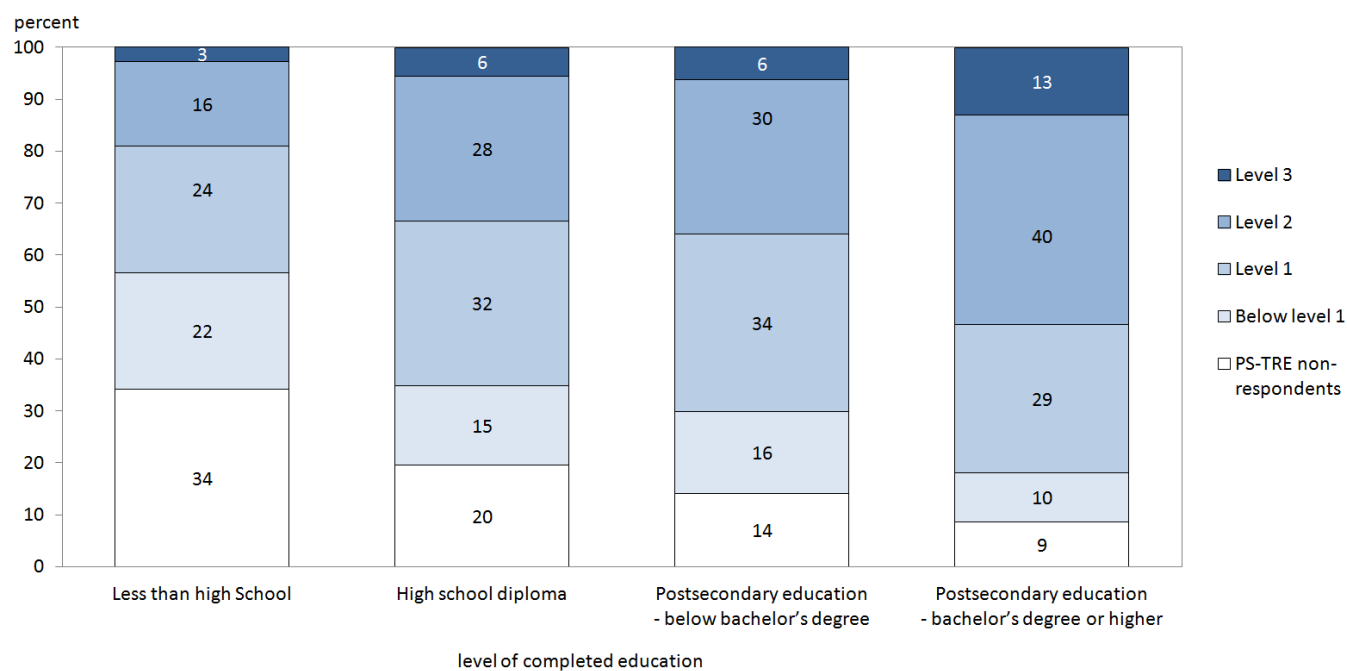
Averages and proficiency levels of population aged 16 to 65, by highest level of completed education, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.5.

Chart 2.5

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by highest level of completed education, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.6.

Skills highest among those with PSE – bachelor's degree or higher

The relationship between education levels and skills noted above for the entire age spectrum also holds true for each age group: proficiency in literacy (Chart 2.6a), numeracy (Chart 2.6b), and PS-TRE (Chart 2.7) increases with higher levels of educational attainment, irrespective of age cohort.

Within an age cohort, proficiency in literacy, numeracy, and PS-TRE is consistently highest for those with a PSE – bachelor's degree or higher, and lowest for those with less than a high school diploma. Meanwhile, the average literacy and numeracy scores of those with a PSE – bachelor's degree or higher are also greater than those with a PSE – below bachelor's degree.

The magnitude of this difference is most clearly illustrated by the literacy and numeracy scores among those aged 25 to 65: the scores of those with a PSE – bachelor's degree or higher at the 25th percentile are greater than the average scores of those with less than a high school diploma.

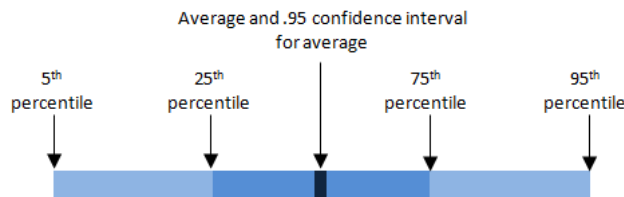
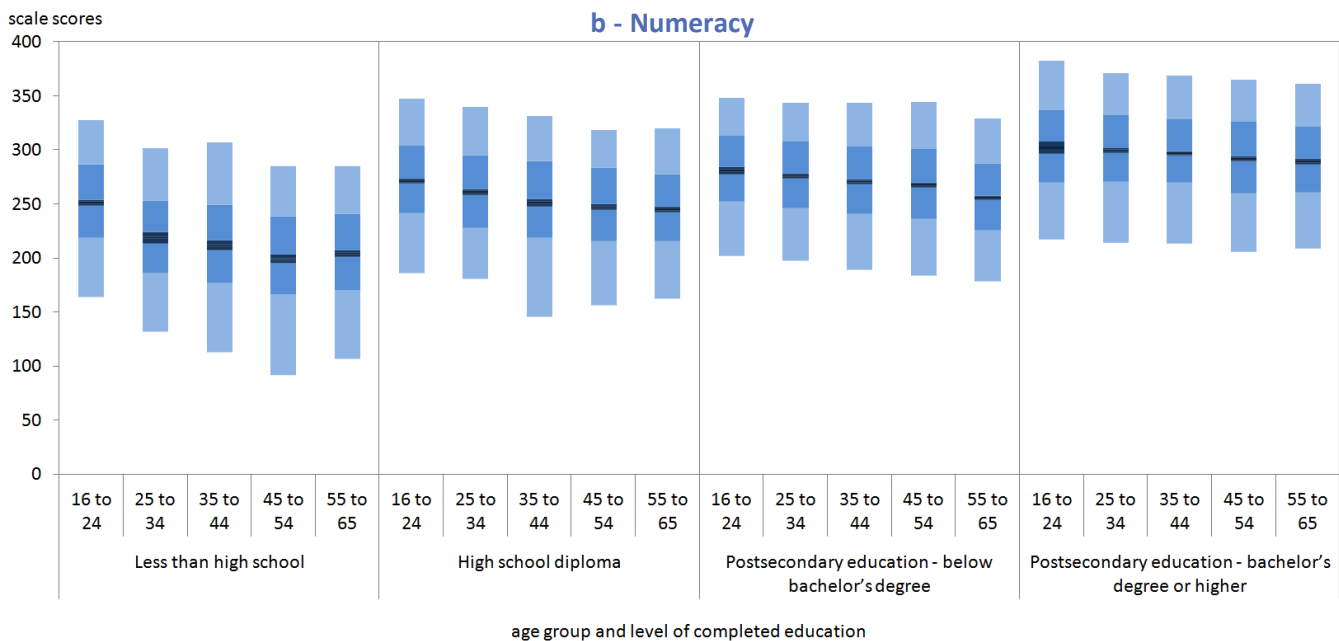
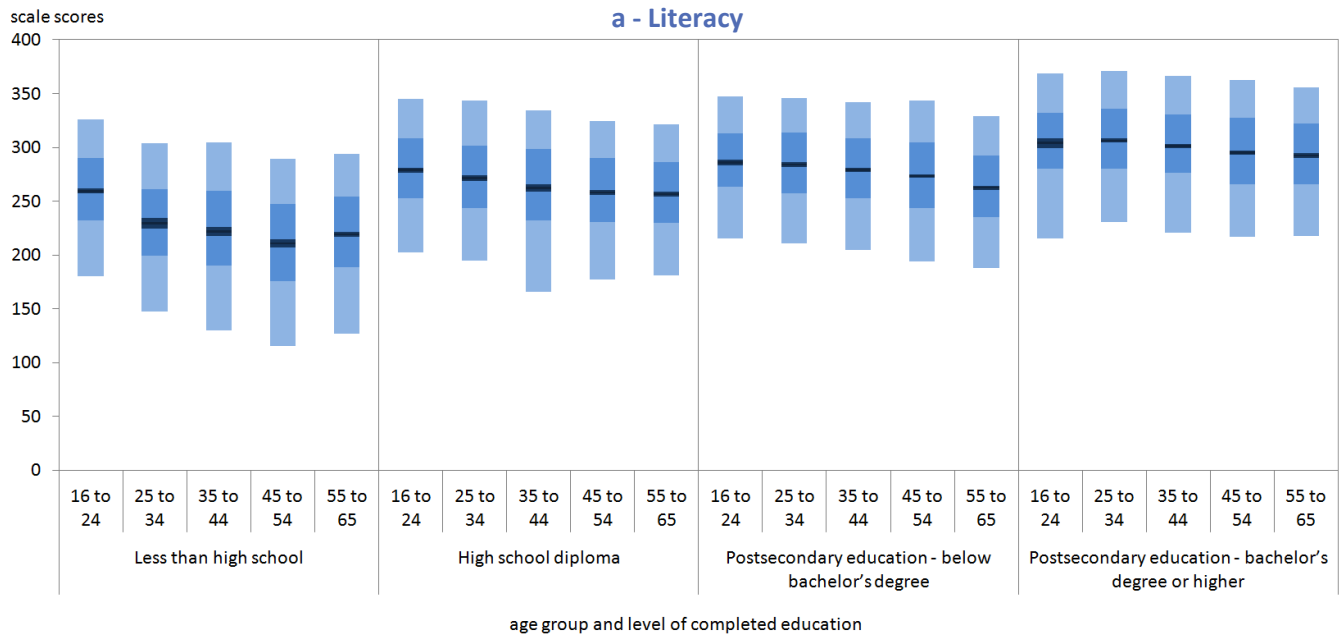
The average score-point difference between those with the lowest level of education and those with the highest level of education is smallest among the 16-to-24 age group (45 points for literacy and 51 points for numeracy), and greatest among those aged 45 to 54 (84 points for literacy and 93 points for numeracy).

The difference in literacy and numeracy skills by age is less pronounced for those with a postsecondary education

Those with a postsecondary education have the narrowest range of scores (i.e., the difference between the 5th and 95th percentiles is smallest); those with less than a high school diploma have the widest range. This pattern is evident in each age group, but the greatest difference in ranges between those with and without postsecondary education is in the 35-to-44 age group.

Chart 2.6

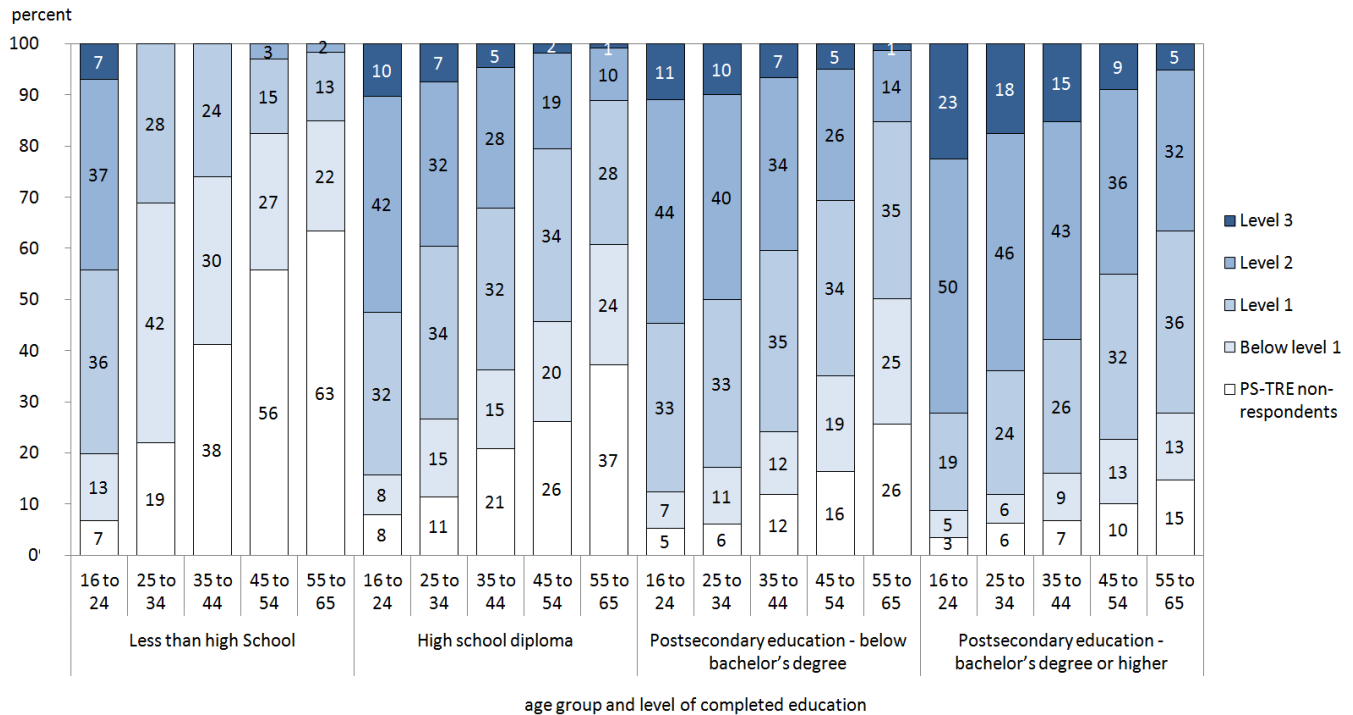
Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, by highest level of completed education and age group, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.7.

Chart 2.7

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by highest level of completed education and age group, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.8.

When looking at skill differences among age groups, education appears to moderate the relationship between proficiency scores and age. For those with less than a high school diploma, there is a 40-point difference in the average literacy and numeracy scores between those aged 16 to 24 and those aged 55 to 65. For these same age groups, the difference narrows to 12 points for individuals with a PSE – bachelor’s degree or higher.

Labour market

Labour force status

This section examines the relationship between skills proficiency and labour force status across the entire age range, which is divided into three categories: employed, unemployed, and not in the labour force. The distribution of Canada’s population of 16-to-65 year olds among these categories is as follows: 76% are employed, 4% are unemployed, and 20% are not in the labour force⁶.

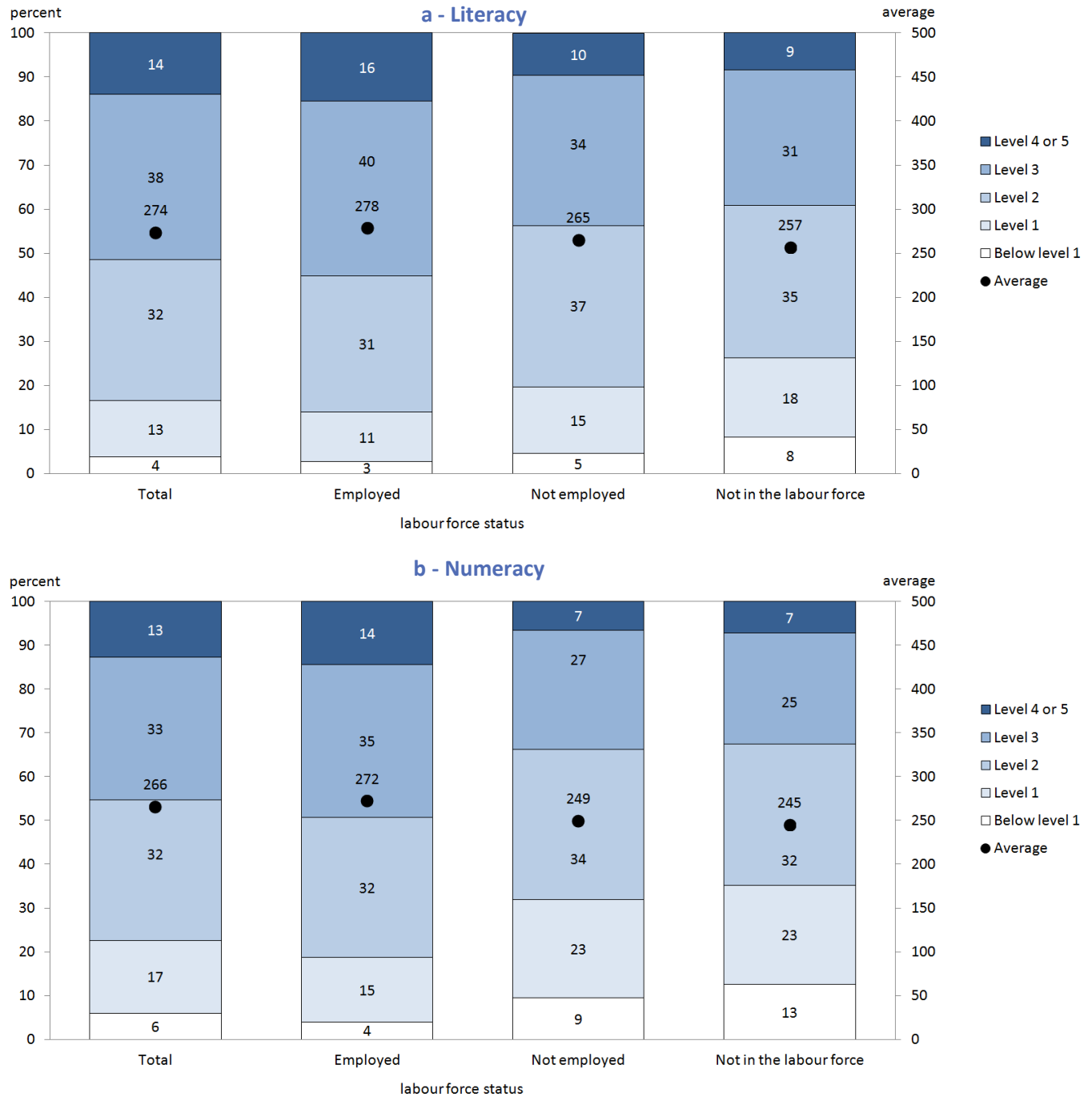
Literacy and numeracy skills are higher for the employed population

Those who are employed have significantly higher scores in literacy and numeracy than those who are not employed, with average scores of 278 for literacy and 272 for numeracy (Chart 2.8a and Chart 2.8b). Moreover, about 15% of the employed are at Level 4 or 5 for both literacy and numeracy, compared with 9% for literacy and 7% for numeracy among those who were not in the labour force.

6. These percentages of employed, unemployed and adults not in the labour force obtained from PIAAC are very similar to what was found in the Labour Force Survey in 2012.

Chart 2.8

Averages and proficiency levels of population aged 16 to 65, by labour force status, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.9.

Conversely, 20% of the unemployed and 26% of those not in the labour force are at Level 1 or below for literacy, compared with 14% of the employed. The differences are somewhat greater for numeracy: 32% of the unemployed and 35% of those not in the labour force are at Level 1 or below, compared with 19% of the employed.

Not being in the labour force, rather than being unemployed, is associated with lower PS-TRE skills

The picture for PS-TRE differs slightly from that for literacy and numeracy, with Chart 2.9 showing only small differences between the employed and unemployed. At Level 2 or 3, while there is no statistically significant difference between the employed (40%) and the unemployed (37%), the proportion of those not in the labour force at these two levels (26%) is substantially lower than the first two groups. Meanwhile, the proportion at Level 1 or below is similar across all three groups (46% for the employed, 46% for the unemployed, and 45% for those not in the labour force).

Those not in the labour force were the least likely to have completed the computer-based assessment (29%). This compares to 14% for the employed and 17% for the unemployed.

Chart 2.9

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by labour force status, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.10.

Occupation

This section examines the relationship between information-processing skills and occupation across the entire age range (16 to 65).

Occupation here is defined by the international indicator used in PIAAC to distinguish four major occupational categories. These categories group occupations based on the nature of the job and the required skill level, where a job is defined as the set of tasks and duties to be performed, and skills are defined as the abilities to carry them out. These categories, together with the proportion of Canadians who have been employed in the past five years⁷ that fall into each one, are as follows: 50% - Managerial and professional occupations, 26% - Service and support occupations; 16% - Trade, production and manufacturing occupations, and 8% - Manual and other service occupations.

Managerial and professional occupations are associated with greater literacy, numeracy, and PS-TRE skills

At the national level, workers in managerial and professional occupations score higher on literacy, numeracy, and PS-TRE than any of the other groups (see Table 2.1).

The average literacy score for managerial and professional occupations of 292 is 26 points higher than that for service and support occupations, and more than 40 points higher than that for manual and other service occupations. Moreover, average literacy is 9 points higher in service and support occupations than in trade, production, and manufacturing occupations. Average literacy scores are about the same for workers in manual and other service occupations and trade, production, and manufacturing occupations.

For numeracy, managerial and professional occupations average highest, at 286, and manual and other service occupations lowest, at 241. However, service and support occupations, together with trade, production, and manufacturing occupations, average the same level, at 254. Unlike literacy scores, numeracy scores for trade, production and manufacturing occupations average 13 points higher than scores for manual and other service occupations.

Measuring PS-TRE, 50% of workers in managerial and professional occupations are at Level 2 or 3. This is substantially greater than service and support occupations, at 34%. In this skill domain (as with literacy), trade, production, and manufacturing occupations scored nearly the same as manual and other service occupations. However, the proportion of service and support occupations at Level 2 or 3 is considerably greater than that for trade, production, and manufacturing occupations.

Table 2.1

Literacy, numeracy and PS-TRE — Performance of population aged 16 to 65, by occupation, Canada, 2012

Occupation	Literacy		Numeracy		PS-TRE, Levels 2 and 3	
	average	standard error	average	standard error	percent	standard error
Managerial and professional occupations	292	(0.8)	286	(0.8)	49	(0.9)
Service and support occupations	266	(1.0)	254	(1.3)	34	(1.2)
Trade, production, and manufacturing occupations	256	(1.8)	254	(1.9)	21	(1.3)
Manual and other service occupations	251	(2.2)	241	(2.4)	25	(1.8)

Source: Programme for the International Assessment of Adult Competencies, 2012.

7. Occupations were derived only for people who had been employed within the previous five years: this excluded 9% of the overall sample aged 16 to 65.

The difference in literacy and numeracy skills by age is less pronounced for workers in managerial and professional occupations

This section examines the relationship between proficiency and occupational skill across the entire age range⁸ (Chart 2.10a and Chart 2.10b).

Across all ages, average literacy and numeracy scores are consistently highest for the managerial and professional occupations, and lowest for the manual and other service occupations. The average literacy and numeracy scores of workers in the most skilled group are greater in each age group than for any other occupational group.

In addition, literacy and numeracy scores of workers in the managerial and professional occupations at the 25th percentile are greater than the average scores for workers in the manual and other service occupations for every age group, except those under age 24.

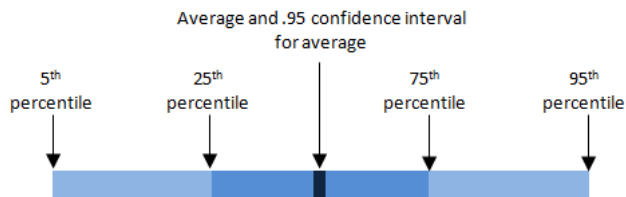
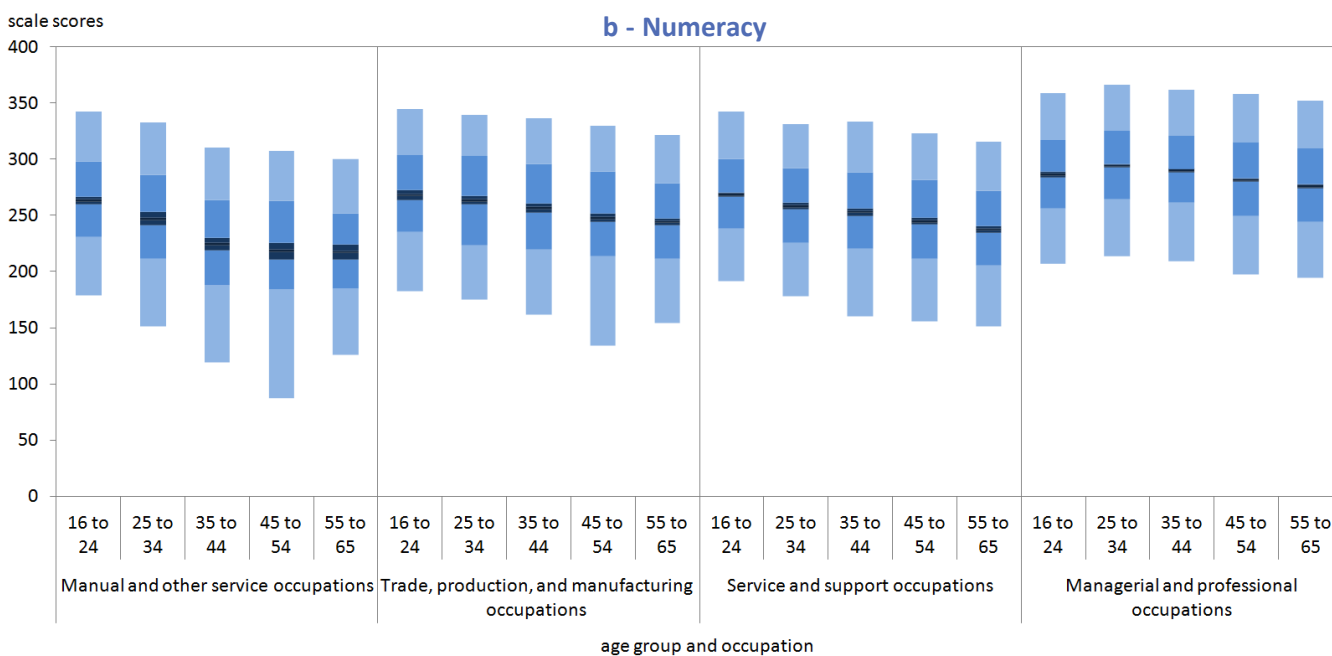
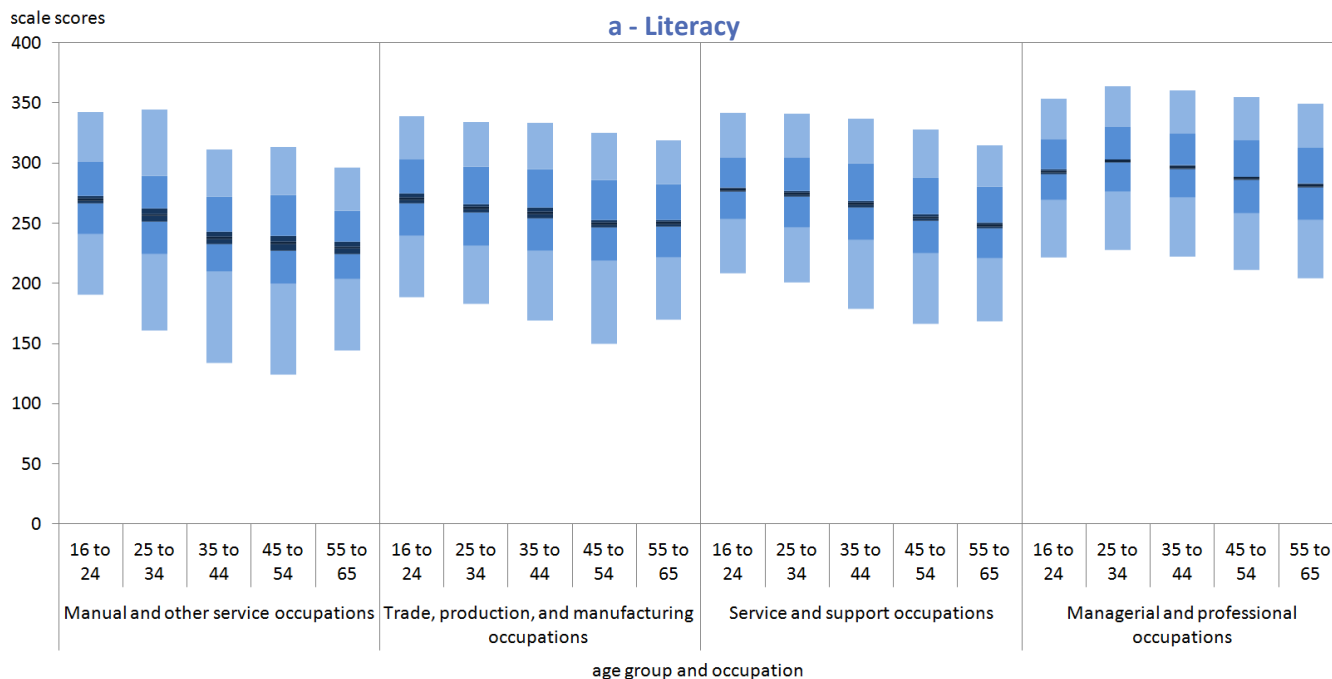
The gap in skills proficiency between older and younger workers in literacy and numeracy is less in more skilled occupations. This is most evident when comparing the youngest group (16 to 24) with the oldest (55 to 65). For literacy, the difference between the two age cohorts is greatest for the manual and other service occupations, at 40 points; whereas for the managerial and professional occupations the difference narrows to 11 points. The other occupational categories fall in between: the difference in the trade, production, and manufacturing occupations is 21 points, and in the service and support occupations it is 29. This trend is similar for numeracy.

Turning now to the *range* of skill levels (i.e., how far apart the 5th and 95th percentiles are from each other) within occupations, the widest range is found among the manual and other service occupations, and the narrowest difference is found in the managerial and professional occupations. This is mostly evident regardless of age group. However, by age 55 to 65, there is very little difference in skill distribution between the occupational groupings on literacy; the range from 5th to 95th percentile is about 150 for the four occupational groups. The 55-to-65 age range still shows a difference across occupational skill categories for numeracy, but it is substantially less than in younger ages.

8. Note that only 14% of those aged 16 to 24 were employed in the last five years.

Chart 2.10

Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, by occupation and age group, Canada, 2012



Source: Programme for the International Assessment of Adult Competencies, 2012. See Table B.2.11.

Education and Occupation

As we have seen in this chapter, PIAAC results highlight the relationship between skills and educational attainment on the one hand, and occupations and skill levels on the other. Specifically, skills proficiency increases with higher levels of educational attainment and is associated with more-skilled occupations. This section provides some initial analysis of the association between occupation, educational attainment, and information-processing skills⁹ (Table 2.2).

In general, at each level of educational attainment, workers in managerial and professional occupations demonstrate higher proficiency in literacy, numeracy, and PS-TRE than their counterparts working in other types of occupations

As noted in the previous section, 50% of workers surveyed in Canada were in managerial and professional occupations, which is significantly higher than the OECD average of 39%. As shown in Table 2.2, workers with the highest scores in all three domains are those with a PSE – bachelor’s degree or higher who work in managerial and professional occupations. These represent four in five university graduates, and 22% of Canadian workers. Those with the lowest scores in literacy, numeracy, and PS-TRE are workers with less than a high school diploma who work in manual and other service occupations. This group represents just 2% of Canadian workers.

Meanwhile, workers in service and support occupations score higher than those in trade, production, and manufacturing occupations in literacy and PS-TRE — across all levels of education. When it comes to numeracy, however, this is not always the case: workers in trade, production, and manufacturing occupations with postsecondary education attain higher average scores than their counterparts in the service and support occupations. Also, workers in manual and other service occupations with a high school diploma or less attain higher scores than workers in trade, production, and manufacturing occupations for PS-TRE.

This chapter examined the level and distribution of information-processing skills in Canada across selected socio-demographic characteristics. Literacy, numeracy, and PS-TRE were assessed with respect to age, gender, education, employment, and occupational skill to gain a better understanding of skill-related differences between groups. Education and employment are two factors that are critical in the development and maintenance of skills. Education can aid in acquiring skills, while employment (both the tenure and the type of work) can affect the maintenance, and possibly the further development, of these skills over time. Overall, the findings are consistent with those for other participating countries (OECD 2013b).

Table 2.2

Literacy, numeracy and PS-TRE — Information processing skills of Canadians in each occupation, population aged 16 to 65, by highest level of completed education, Canada, 2012

Occupation	Postsecondary education - bachelor's degree or higher					Postsecondary education - below bachelor's degree					High school diploma					Less than High School								
	Literacy avg.	Numeracy s.e.	PS-TRE avg.	Numeracy s.e.	PS-TRE %	Literacy s.e.	Numeracy avg.	PS-TRE s.e.	Numeracy %	PS-TRE s.e.	Literacy avg.	Numeracy s.e.	PS-TRE avg.	Numeracy s.e.	PS-TRE %	Literacy s.e.	Numeracy avg.	PS-TRE s.e.	Numeracy %	PS-TRE s.e.				
Managerial and professional occupations	306	(1.1)	302	(1.0)	59	(1.2)	286	(1.3)	278	(1.4)	45	(1.4)	280	(1.9)	271	(2.1)	43	(2.3)	253	(4.1)	245	(4.4)	27	(3.9)
Service and support occupations	279	(2.8)	269	(3.6)	39	(3.6)	270	(1.9)	257	(2.1)	33	(2.1)	267	(1.9)	255	(2.1)	37	(2.2)	246	(2.9)	235	(3.2)	27	(3.3)
Trade, production, and manufacturing occupations	271	(5.4)	279	(6.2)	33	(5.6)	269	(2.1)	271	(2.3)	27	(2.2)	258	(3.3)	251	(3.6)	19	(2.6)	224	(3.3)	215	(3.3)	8	(1.8)
Manual and other service occupations	274	(8.2)	263	(8.5)	36	(8.8)	263	(4.6)	254	(4.9)	28	(4.4)	261	(3.1)	251	(3.7)	29	(3.1)	226	(3.9)	214	(4.5)	17	(2.8)

Notes: avg.: Average.
s.e.: Standard error.

Source: Programme for the International Assessment of Adult Competencies, 2012.

9. Occupations were derived only for people who had been employed within the previous five years: this excluded 9% of the overall sample aged 16 to 65.

Chapter 3

Skill Levels of Selected Populations Within Canada

Highlights

- *At the national level, Aboriginal populations score lower on literacy, numeracy and PS-TRE than the non-Aboriginal population; however, the gap varies considerably across provinces and territories.*
- *Immigrants score lower on these skills than the Canadian-born population. Recent and established immigrants' skills are similar in literacy and numeracy but at the national level, a larger proportion of established immigrants did not take the computer-based assessment for PS-TRE.*
- *Official-language minority populations tend not to perform as well as official-language majority populations (except for Anglophones in Quebec), but differences vary across provinces.*

In addition to measuring the skills of the Canadian population, PIAAC provides information on the literacy, numeracy and PS-TRE skills of population groups that are unique to Canada's makeup relative to other countries. This chapter explores skill levels of three specific population groups within selected provinces and territories: Aboriginal peoples, immigrants, and official-language minority communities.

It should be borne in mind that PIAAC was administered in Canada's two official languages —English and French. For many Aboriginal people and immigrants, neither of these languages is their mother tongue (i.e., the first language learned at home in childhood and still understood); and not all respondents from an official-language minority chose to complete the survey in their mother tongue.

This chapter provides an overview of the results and will be followed by a series of thematic reports that will subject them to deeper analysis.

In order to provide contextual elements behind the PIAAC results for each of the three selected populations, some 2011 National Household Survey (NHS) or Census results are presented at the beginning of each section.¹⁰

Proficiency of Aboriginal peoples

In the 2011 NHS, about 3% of the Canadian population aged 16 to 65 reported an Aboriginal identity, not including First Nations people living on reserve.¹¹ Aboriginal people surveyed¹² in PIAAC are composed of First Nations peoples living off-reserve (48%), Métis (44%), and Inuit (5%).¹³ Most Aboriginal people reside in Ontario and the western provinces, but their proportion of the population between 16 and 65 is highest in the territories: 81% in Nunavut, 46% in Northwest Territories, and 21% in Yukon.

In PIAAC, oversamples of Aboriginal people were drawn in Ontario, Manitoba, Saskatchewan, British Columbia (only for those living off-reserve in large urban population centres), Yukon, Northwest Territories, and Nunavut. The results were compiled to provide a picture of their skill levels in literacy, numeracy, and PS-TRE, enabling more detailed analysis of the proficiency of these populations in the seven provinces and territories.

10. Although PIAAC provides reliable estimates for the selected populations, the variability of the 2011 Census or National Household Survey (NHS) estimates is lower than the one from surveys with much smaller sample size such as PIAAC.

11. The term "aboriginal identity" refers to whether the person reported being an Aboriginal person (First Nations, Métis or Inuit).

12. Further analysis will be undertaken in a forthcoming thematic report to specifically examine each of the three Aboriginal groups separately if sample size permits.

13. A further 1% reported multiple Aboriginal identities, and 2% reported Aboriginal identities not included elsewhere.

As part of this analysis, skills in these three domains were also compared between the Aboriginal and non-Aboriginal populations. When interpreting the differences between them, it is important to keep in mind that these are two very different populations. They present very different profiles in age, employment, and educational attainment, and these factors are closely associated with the abilities measured by PIAAC. Forthcoming analysis will examine these factors in more detail, to better understand the relationship between skill levels and socio-demographic attributes.

Box 3

Aboriginal populations of Canada

The Aboriginal populations of Canada are very diverse. They comprise a number of distinct cultures and languages, and are distributed in a variety of settings — from urban population centres to small, sometimes remote communities, in both the north and south of the country. They are also young and growing rapidly. In 2011, 24% of the Aboriginal population aged 16 to 65, not including First Nations people living on reserve, were categorized as youth (i.e., 16 to 24 years of age), compared to 17% among the non-Aboriginal population. Among the seven oversampled provinces and territories, the proportion of youth varied from 22% in Ontario to 32% in Nunavut. Furthermore, the number of Aboriginal people aged 16 to 65 in Canada rose by over 20% between 2006 and 2011 (NHS, 2011).

While educational outcomes for these populations are improving, a high proportion of those aged 16 to 65 had no certificate, diploma, or degree: just over a quarter in Ontario and British Columbia; about a third in Manitoba, Saskatchewan and Yukon; almost half in Northwest Territories; and two-thirds in Nunavut. In comparison, the proportions of non-Aboriginal people aged 16 to 65 in the same provinces and territories who had no certificate, diploma, or degree varied from 6% in Nunavut to 17% in Manitoba (NHS, 2011).

Aboriginal people have lower scores in literacy and numeracy than the non-Aboriginal people

The Aboriginal population across Canada scores an average of 260 in literacy, which is lower than the average score of 274 for the non-Aboriginal population (Chart 3.1). For the seven provinces and territories that were oversampled, this difference also holds true, but the magnitude of the difference varies. In Ontario and British Columbia, it is 7 and 10 points, respectively; in the three territories, it is more than 40 points.

Chart 3.1 also shows the distribution of literacy skills across Aboriginal and non-Aboriginal populations. At the national level, 8% of Aboriginal people score at Level 4 or 5, compared to 14% for non-Aboriginal people. At the other end of the proficiency scale, a larger proportion of the Aboriginal population (24%) is at Level 1 or below compared to the non-Aboriginal population (16%).

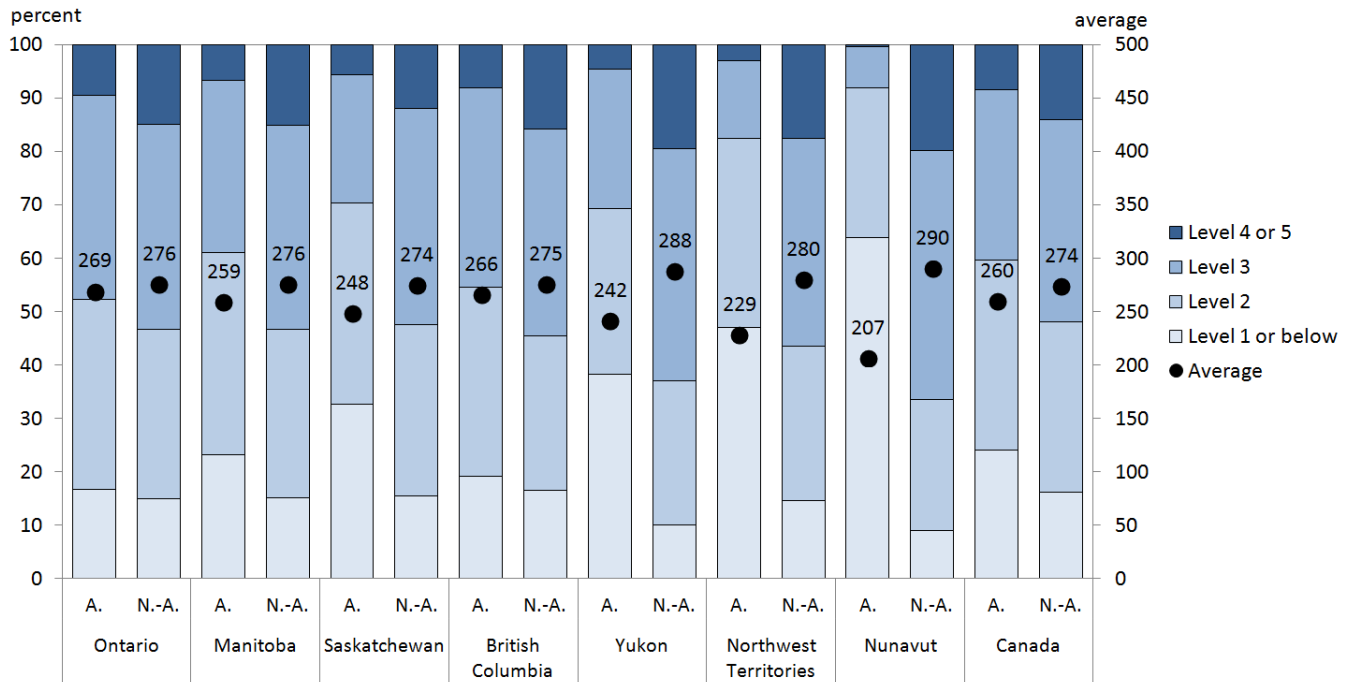
At the provincial and territorial level, there is again great variation. In Ontario and British Columbia (where the differences in average scores are smallest), there is a measurable difference between Aboriginal and non-Aboriginal populations at Level 4 or 5; at the other levels, however, there is no major difference. In Yukon there is a difference between Aboriginal and non-Aboriginal populations only at the lowest level (Level 1 or below).

In Manitoba, Saskatchewan, Northwest Territories and Nunavut, however, there is a notable difference at both high and low levels. Fewer Aboriginal people than non-Aboriginal people record scores at Level 4 or 5, and many more record scores at Level 1 or below; in the three territories, the proportions at the lowest levels are at least three times higher than for the non-Aboriginal population.

The average numeracy score for the Aboriginal population across Canada is 244, whereas the score for the non-Aboriginal population is 266 (Chart 3.2). In all the seven provinces and territories oversampled, Aboriginal populations score lower than their non-Aboriginal counterparts, but these differences vary considerably. Among the four provinces, the difference ranges from 15 points in Ontario to 35 in Saskatchewan; in the territories, the difference is more than 50 points. Within each province and territory, the difference is slightly larger for numeracy than for literacy.

Chart 3.1

Literacy — Averages and proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012

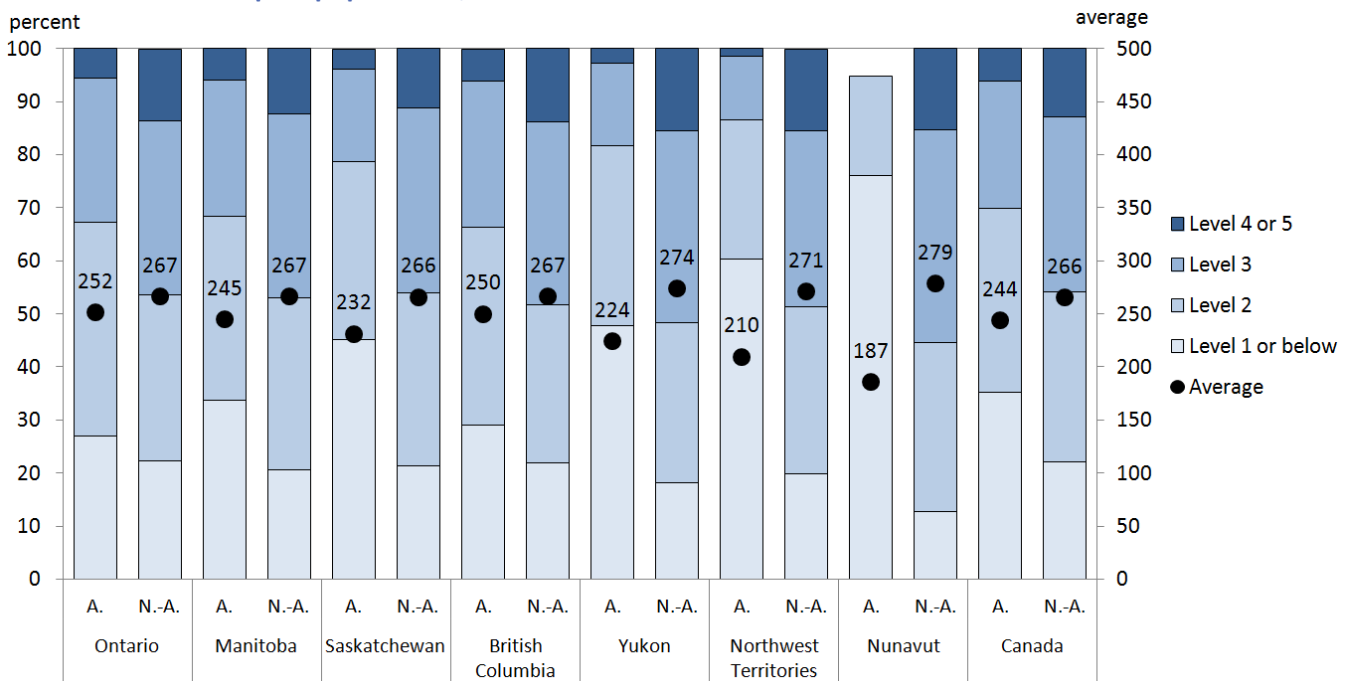


Note: A. refers to Aboriginal and N.-A. refers to Non-Aboriginal.

Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.1.

Chart 3.2

Numeracy — Averages and proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012



Note: A. refers to Aboriginal and N.-A. refers to Non-Aboriginal.

Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.2.

Looking more closely at how numeracy scores are distributed across populations, the picture is again mixed. Nationally, the proportion of those scoring at Level 4 or 5 is lower among the Aboriginal population, at 6%, than among the non-Aboriginal population, at 13%. While the magnitude of the difference varies, this is also true across all seven provinces and territories.

At the other end of the scale, 35% of the Aboriginal population across Canada score at Level 1 or below. This compares with 22% for the non-Aboriginal population. There is no notable difference in Ontario and British Columbia between the two populations for this level of proficiency; whereas in the five other provinces and territories there is, with higher proportions of Aboriginal people appearing in this category.

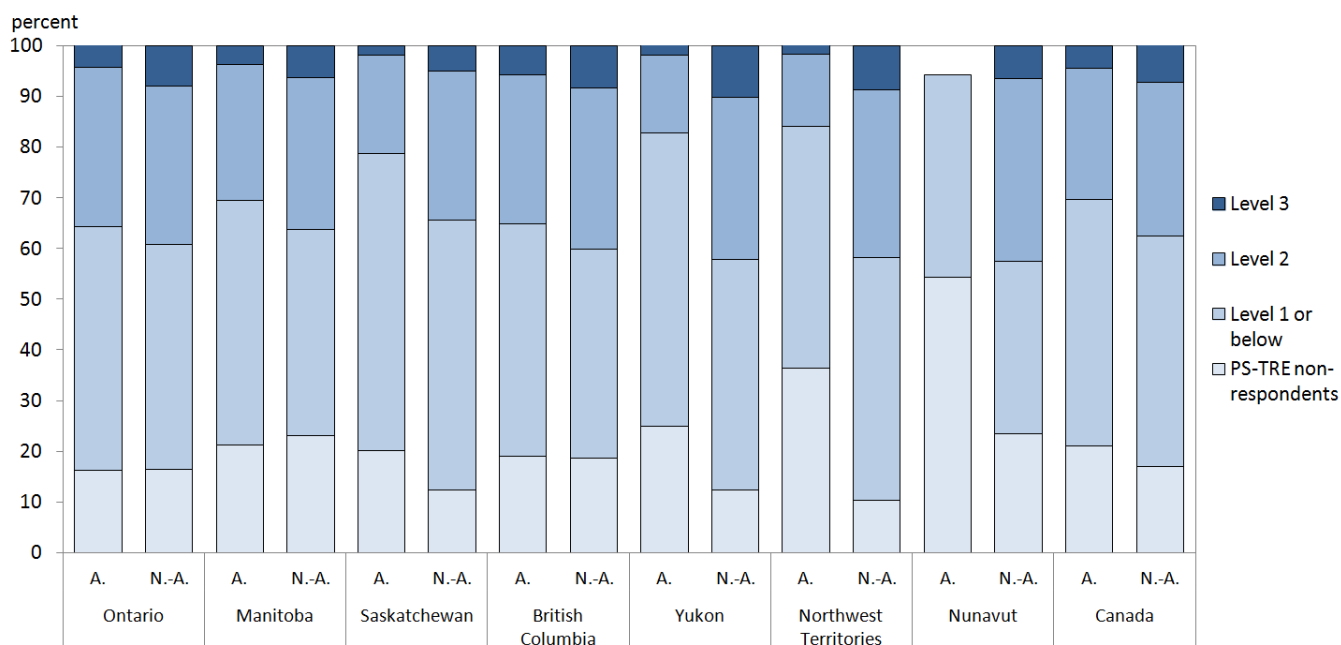
PS-TRE proficiency varies greatly among Aboriginal populations

Proficiency in PS-TRE varies considerably among Aboriginal populations across the country, as do the differences between the Aboriginal and non-Aboriginal populations. Nationally, a smaller proportion of the Aboriginal population score at Level 2 or 3 than the non-Aboriginal population, and the same is true in Saskatchewan and the territories. In Ontario, Manitoba, and British Columbia, however, there is no difference between the two populations in PS-TRE proficiency.

As noted elsewhere in this report, a certain proportion of respondents were not assessed for PS-TRE, for a variety of reasons. For Canada as a whole, 21% of Aboriginal people were not assessed for PS-TRE, compared to 17% of non-Aboriginal people. In Saskatchewan, Northwest Territories, and Nunavut, a higher proportion of the Aboriginal population than the non-Aboriginal population were not assessed, whereas in Ontario, Manitoba, British Columbia, and Yukon there was no difference between the two populations.

Chart 3.3

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012



Note: A. refers to Aboriginal and N.-A. refers to Non-Aboriginal.

Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.3.

The preceding results constitute only an initial glimpse at the skill levels of Aboriginal peoples in the three domains measured. It is important to remember that PIAAC provides insight into these skills at an unprecedented level of detail. Considerable further analysis is required to fully understand the relationship between skills and socio-demographic characteristics such as age, educational attainment, and mother tongue. In the case of educational attainment, for example, while the context and circumstances may vary, preliminary results suggest that differences in proficiency between Aboriginal and non-Aboriginal populations are all but eliminated at higher levels of education. This analysis will be undertaken in future reports to provide a more precise picture of the proficiencies of different Aboriginal groups across the country.

Proficiency of immigrants to Canada

Canada is a multicultural society with a large number of immigrants: in the 2011 National Household Survey, foreign-born individuals¹⁴ made up 22% of the Canadian population aged 16 to 65. In addition, this population has become more diverse over time. While historically immigrants came predominantly from European countries, in recent decades they have originated from around the world, with Asia now contributing the largest numbers. Among recent immigrants (those in Canada for 10 years or less) aged 16 to 65, 80% had a language other than English or French as mother tongue.

PIAAC provides skill information for immigrants across the country, as well as for immigrants in Ontario, British Columbia, and Quebec, which together account for 85% of Canada's foreign-born population. This focus is highly detailed, since oversampling in these three provinces permitted comparisons to be made between established immigrants and recent ones.

Most immigrants have a mother tongue other than English or French. PIAAC was administered in Canada's two official languages. The results could be influenced by their proficiency in the language chosen. However, it is important to assess immigrants' proficiency for the three skills in English or French if they are to participate fully in a society where these two languages are the most commonly used. The 2011 NHS showed that close to 99% of Canadian workers use either one or both of these two languages in the workplace.

This section analyzes three groups: recent immigrants, established immigrants, and people born in Canada. The results are broken down for Canada as a whole, and for each of the three provinces that were oversampled.

Immigrants show lower proficiency in literacy and numeracy than the Canadian-born population

Immigrants in Canada aged 16 to 65 have lower average scores than the Canadian-born population for literacy (Chart 3.4) and for numeracy (Chart 3.5). The same holds true for immigrants in Ontario, Quebec, and British Columbia. The results show further that there is no major difference in scores between recent and established immigrants, even though their respective socio-demographic profiles are different.

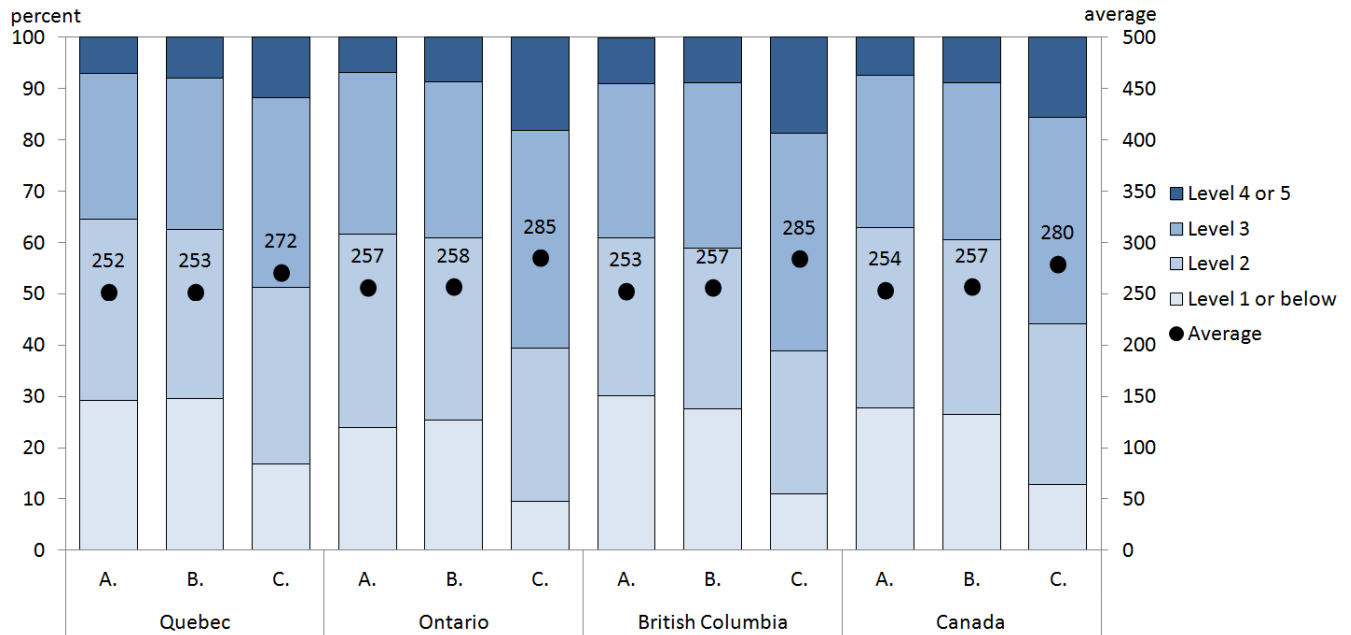
Looking at the distribution of literacy skills, in Canada as a whole there are lower proportions of recent (7%) and established (9%) immigrants scoring at Level 4 or 5 than among the Canadian-born population (16%). Immigrants in Quebec, Ontario and British Columbia follow this pattern. At Level 1 or below, recent immigrants (28%) and established immigrants (26%) across Canada are more heavily represented than the Canadian-born population (13%).

Similar — but not identical — results are obtained for numeracy. At Level 4 or 5, the proportions of recent and established immigrants (9% and 10% respectively) are lower than the proportion of their Canadian-born counterparts (14%); at Level 1 or below, the proportions of recent (34%) and established (33%) immigrants are above that of the Canadian-born population (19%).

14. In this analysis, the foreign-born population is also referred to as the immigrant population. An immigrant is a person who is, or has ever been, a landed immigrant/permanent resident. This person has been granted the right to live in Canada permanently by immigration authorities. Some immigrants have resided in Canada for a number of years; others have arrived recently. Some immigrants are Canadian citizens; others are not.

Chart 3.4

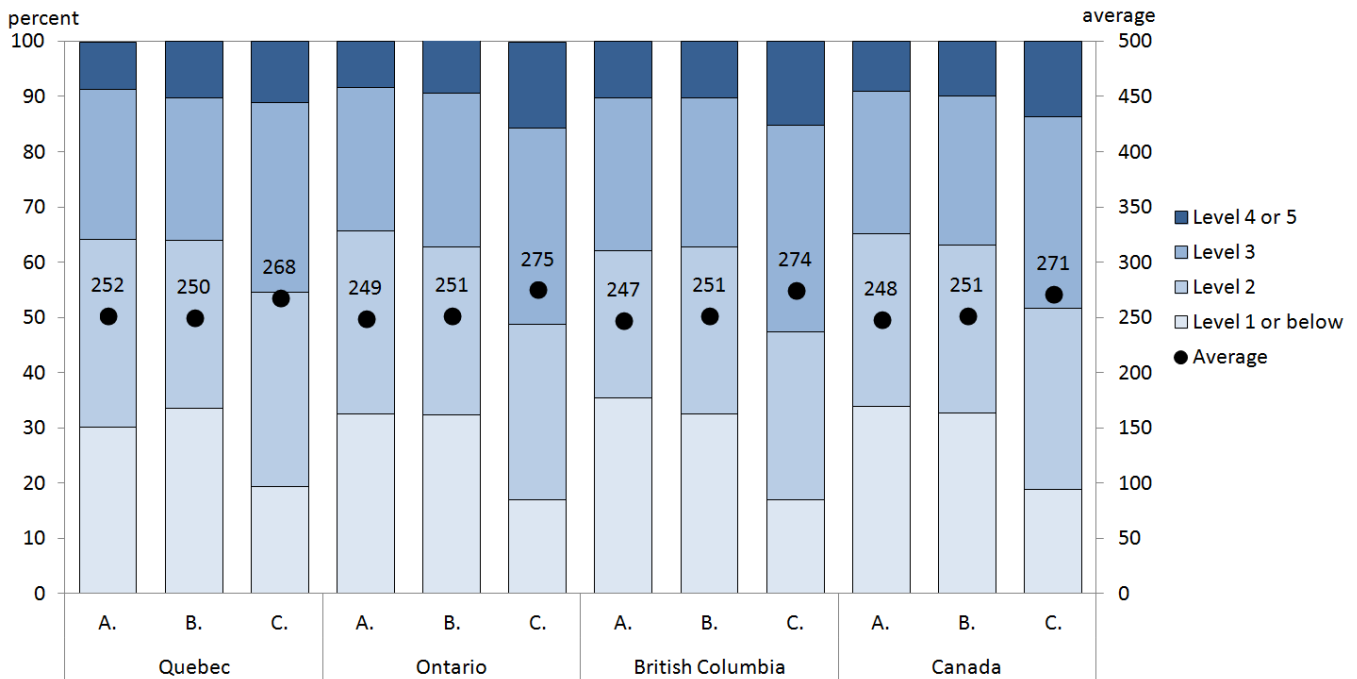
Literacy — Averages and proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012



Note: A. refers to Recent immigrant, B. refers to Established immigrant and C. refers to Canadian-born.
 Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.4.

Chart 3.5

Numeracy — Averages and proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012



Note: A. refers to Recent immigrant, B. refers to Established immigrant and C. refers to Canadian-born.
 Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.5.

At the provincial level, in Ontario the proportion of recent and established immigrants at Level 4 or 5 falls below that of the Canadian-born population. In British Columbia only the proportion of recent immigrants at Level 4 or 5 is larger than that for the Canadian-born, while in Quebec the proportion at these levels does not differ (Chart 3.5).

PS-TRE performance differs between established and recent immigrants

For the country as a whole, a smaller proportion of recent and established immigrants (26 and 27% respectively) score at Level 2 or 3 in PS-TRE than their Canadian-born counterparts (41%). This is also the case for the three oversampled provinces.

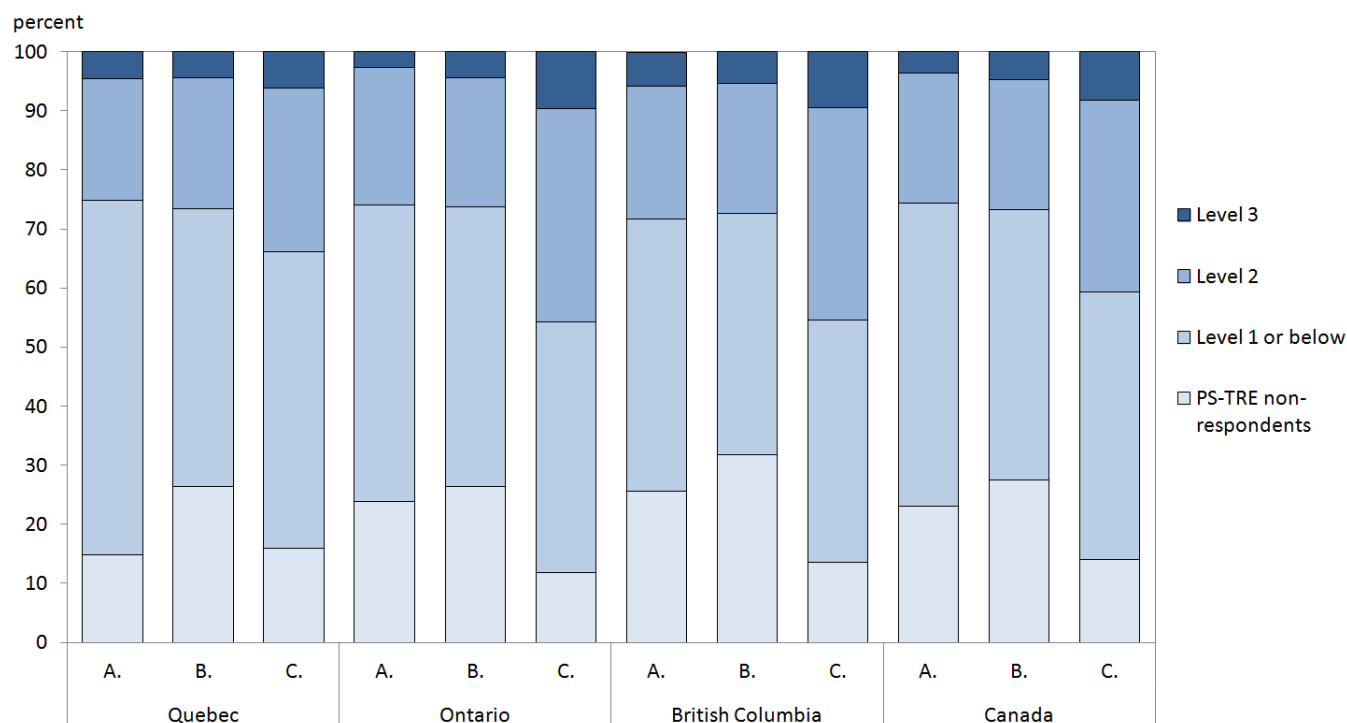
At the other end of the proficiency scale, 45% of the Canadian-born population scores at Level 1 or below, whereas a greater proportion of Canada's recent immigrants fall into this category (51%). There is no significant difference, however, between the Canadian-born and the established immigrants. These findings hold true for Ontario and Quebec. However, there are no significant differences between the Canadian-born and recent and established immigrants in British Columbia.

For Canada as a whole, the proportion of recent and established immigrants who were not assessed in PS-TRE is higher than that of their Canadian-born counterparts (Chart 3.6). It is worth noting that the proportion of established immigrants who were not assessed in PS-TRE (28%) is higher than the proportion for recent immigrants (23%) for the country as a whole and for Quebec; for Ontario and British Columbia the difference is not significant.

The skills proficiency of immigrants, the differences in skill levels between immigrants and the Canadian-born population, and the differences between recent and established immigrants merit further analysis. As is the case with other populations within Canada, these differences do not yield to simple explanations. The diversity of the immigrant population, together with such factors as age, educational attainment, and language proficiency require careful examination of the data gathered by PIAAC. Further reports on these populations will undertake this examination.

Chart 3.6

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012



Note: A. refers to Recent immigrant, B. refers to Established immigrant and C. refers to Canadian-born.

Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.6.

Proficiency of official-language minority populations

Canada's two official languages, English and French, are an integral part of Canada's social, economic and cultural makeup. The distribution of official-language minority (OLM) populations in Canada varies in proportion and in population density from one province to another. According to the 2011 Census, about 80% of the Francophone population outside of Quebec aged 16 to 65 lives in Ontario, New Brunswick, and Manitoba. In Ontario, about 4% of the population has French as a mother tongue, with the highest densities found through the mid-north-east portion of the province, an area with smaller population centres. In New Brunswick, approximately 32% of the population belong to the French-language community, which is more concentrated in the north and southeast. Manitoba's Francophone minority is mostly concentrated in Winnipeg and environs, and accounts for about 4% of the population aged 16 to 65. In Quebec, about 8% of the population aged 16 to 65 has English as a mother tongue, with 74% concentrated in the Montreal metropolitan area, and smaller proportions in the Outaouais and Estrie regions.

The sample of official-language minority populations in PIAAC was selected based on mother tongue.¹⁵ Additional samples of official-language minority populations were selected in the four provinces — New Brunswick, Quebec, Ontario, and Manitoba — enabling a more detailed analysis of the proficiency of these populations. Those in provinces outside Quebec have French as mother tongue; those in Quebec have English as mother tongue.

15. PIAAC also asked questions on the main home language and on the ability to speak English or French, so the first official language spoken can also be derived. This criterion is more inclusive, as it allocates the Canadian population between the country's two main language groups, including those whose mother tongue is a language other than English or French, and who are likely to use one of these two languages in their everyday life. The kind of analysis done in this section can also be done using this criterion.

This analysis only looks at differences between people reporting English or French as a mother tongue, and who live in a minority language situation. Those who have reported both or neither are excluded from this analysis.

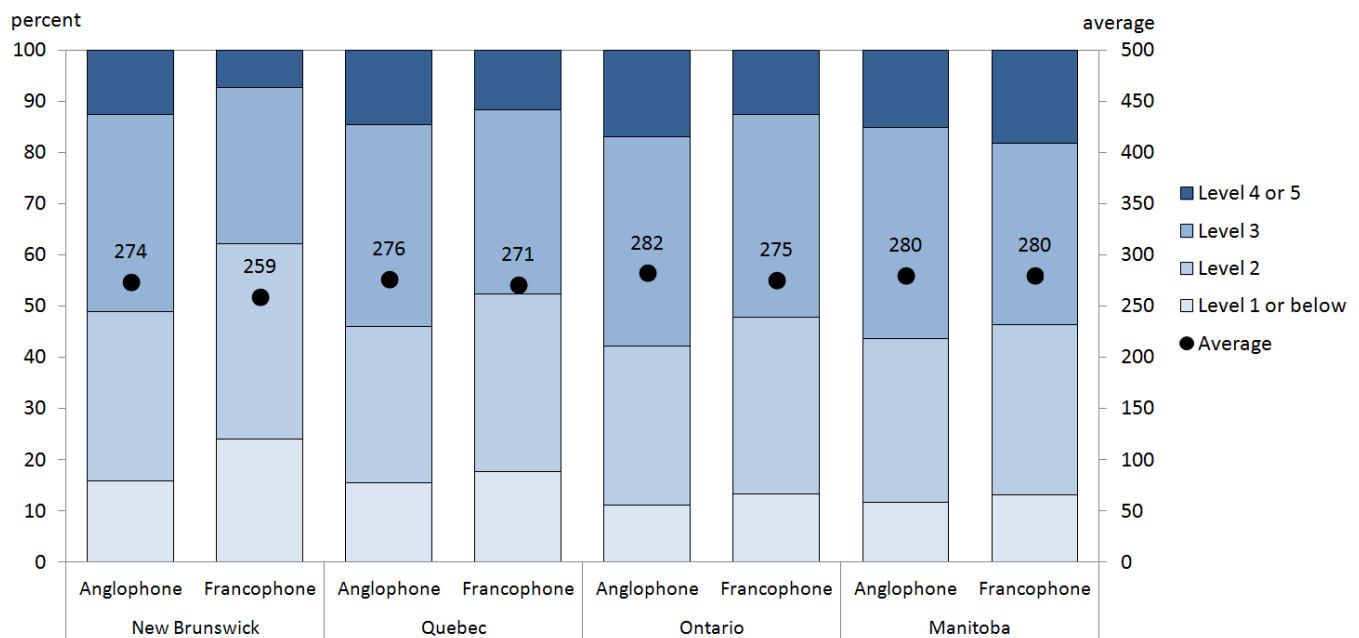
Official-language minority scores lower in literacy than the corresponding majority in New Brunswick but not in Quebec

In New Brunswick, Francophones have lower average literacy scores at 259 than Anglophones at 274; in Quebec, Anglophones have a higher average literacy score at 276 compared to Francophones at 271; and in Manitoba and Ontario, there is no difference between the two populations. The difference between Francophones and Anglophones is most pronounced in New Brunswick, where 15 points separate the two populations (Chart 3.7).

In New Brunswick the proportion of Francophones at Level 4 or 5 is lower (7%) than the proportion of Anglophones who score at these levels (12%), while the proportion scoring at Level 1 or below is higher, 24% for Francophones and 16% for Anglophones. In Ontario, Quebec, and Manitoba, there are no significant differences between Francophones and Anglophones across all levels of proficiency.¹⁶

Chart 3.7

Literacy — Averages and proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012



Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.7.

16. This is true despite the differences in the average scores noted in the previous paragraph. This is because non-significant differences at each level of proficiency add up to a significant difference in score for the populations as a whole.

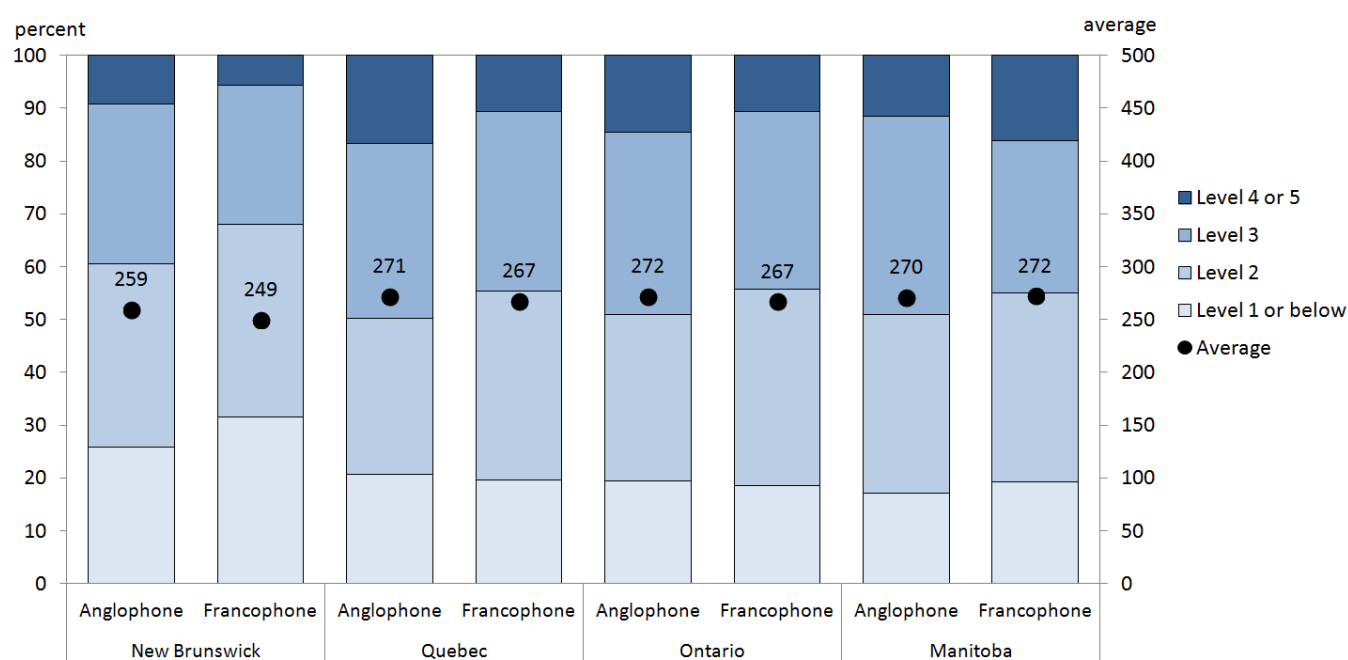
Official-language minority and majority populations scored similarly in numeracy in Quebec, Ontario, and Manitoba

In New Brunswick, Francophones have lower numeracy proficiency than Anglophones, but the 10-point difference in score is narrower than it is for literacy. Both groups show a similar distribution across proficiency levels (Chart 3.8).

In Ontario and Manitoba, Francophones and Anglophones perform similarly in numeracy. In Quebec, there is also no difference in the average numeracy score between the two groups, but there is a difference in their distributions across proficiency levels, with a higher proportion of Anglophones scoring at Level 4 or 5 (17%) than Francophones (11%).

Chart 3.8

Numeracy — Averages and proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012



Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.8.

In Manitoba and Quebec, a higher proportion of the official-language minority populations engage with ICT

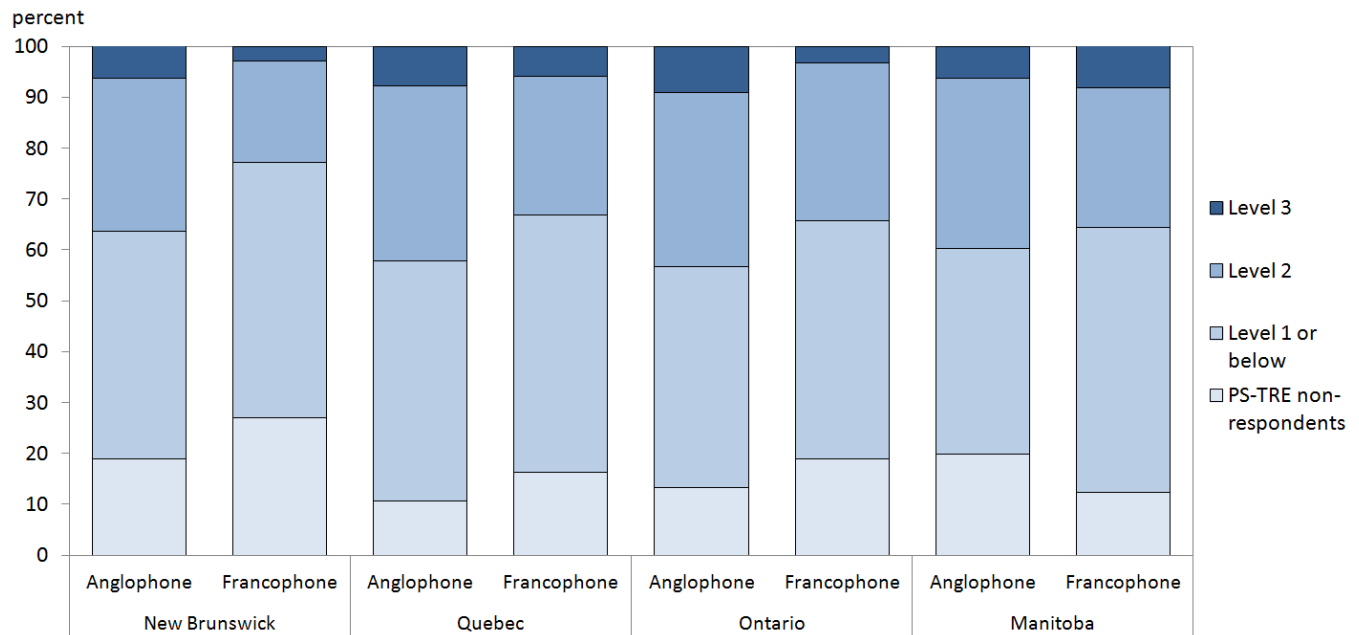
A higher proportion of Anglophones score at Level 2 or 3 in PS-TRE than their Francophone counterparts in New Brunswick, Ontario, and Quebec. In Manitoba, the official-language minority scores at the same level as the majority population in PS-TRE.

In New Brunswick, Quebec, Manitoba and Ontario, there are no differences between the proportion of Anglophones and Francophones scoring at Level 1 or below.

The proportion of official-language minority populations who were not assessed for PS-TRE relative to their majority counterparts is larger in New Brunswick and Ontario, but smaller in Quebec and Manitoba. (Chart 3.9)

Chart 3.9

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012



Source: The Programme for the International Assessment of Adult Competencies, 2012. See Table B.3.9.

The foregoing results should be viewed in light of the different profiles that official-language minority populations present in their respective provinces. Francophone minorities, for example, are more likely than their Anglophone counterparts in the same province to have a high school certificate or less. In Quebec, on the other hand, Anglophones tend to have higher educational attainment than the Francophone majority. Furthermore, official-language minority populations tend to be older than the majority populations. When combined with differences in metropolitan and rural concentrations, as well as differences in such factors as labour market participation, these differences create a highly complex picture that requires further analysis. Future reports will delve into this picture to provide a degree of detail that is oriented to highly specific, local conditions.

Chapter 4

Measures of Literacy and Numeracy in 2003 and 2012

PIAAC constitutes the latest in a series of international studies on adult skills that date back to the early 1990s. The most recent of these was undertaken in 2003: the Adult Literacy and Life Skills Survey (ALL).¹⁷ In total, six countries participating in PIAAC also participated in ALL, including Canada.

From ALL to PIAAC: context, constructs and instruments

To permit comparisons of country measures in literacy and numeracy over time, efforts were made to employ assessment measures in PIAAC that correspond with those used in ALL. This involved a complex undertaking, both conceptually and technically, for the simple reason that the world of today is very different from that of 2003.

In 2003, social media was still in its infancy. The term “apps” meant very little to the general public, and smartphones were still years from widespread adoption. By the time OECD began preparing PIAAC, it was clear that any meaningful measure of skills would have to acknowledge a very different reality from that examined at the time of ALL.

PIAAC reflects this new reality in a number of ways. First, it broadened the concept of literacy. Given the growing importance of digital devices and applications as a means of generating, accessing and storing written text, the reading of digital texts became an integral part of literacy measured in PIAAC.

Second, where ALL reported literacy as two separate domains on two separate scales, covering *prose literacy* and *document literacy*, PIAAC reports literacy as a single domain reported on a single literacy scale that covers the reading of not only *prose* texts and *document* texts, but also of *digital* (such as websites, results pages from search engines and blog posts) and *mixed format* texts (i.e. texts containing both continuous and non-continuous elements).

Third, PIAAC employed *adaptive testing* in the computer-based assessment, which ALL was not able to do since it was entirely paper-based. Adaptive testing adjusts the difficulty of questions as the respondent takes the test. In PIAAC, respondents were directed to different blocks of items based on their estimated proficiency.¹⁸ This kind of testing leads to a more fine-grained distinction in scores.

Fourth, PIAAC gathered significantly more data for constructing the numeracy scale than was collected for ALL, although it uses essentially the same concept of numeracy.

These changes prohibit a direct and immediate comparison of results in PIAAC with those previously reported for ALL. For numeracy, results from 2003 have been re-estimated to refine the measure and to ensure better comparability with the results from PIAAC. For literacy, in PIAAC, a new scale was constructed to merge and incorporate the two measures of ALL into a single literacy measure to ensure better comparability with PIAAC. As a result, readers are cautioned against retrieving the results previously reported for ALL and comparing them with those in PIAAC: the scales used in 2003 and 2012 are not the same, and comparisons are therefore invalid.

17. Conducted in 2003, the International Adult Literacy and Skills Survey (IALSS) is the Canadian component of the Adult Literacy and Life Skills program (ALL). Throughout this chapter we will refer to the survey as ALL.

18. The OECD (2013c, Chapter 3) presents more information on the adaptive testing in PIAAC in their Reader's Companion.

Comparisons over time are only possible once the ALL results for *prose literacy*, *document literacy* and *numeracy* have been re-estimated and re-scaled. Results that follow provide a preliminary look at literacy and numeracy in Canada in 2003¹⁹ and 2012. The information provided is limited and additional analysis is needed to better understand skill differences over time.

Box 4

Canada's experience with international surveys of adult skills

Canada's participation in PIAAC draws on over 20 years of experience in this field. In 1989, Statistics Canada compiled the first Canadian profile on the subject, titled "Literacy Skills Used in Daily Activities." Its findings dispelled the notion that individuals are either literate or illiterate, replacing it with a new concept of literacy as a continuum of skills.

Five years later, Statistics Canada led a consortium of countries in the development of the first multi-country and multi-language assessment of adult literacy: the International Adult Literacy Survey (IALS). This survey shed light on the causes, as well as the social and economic impacts, of different levels of literacy. IALS was important in laying the foundation for international comparative study, and between 2003 and 2008, a second international survey was launched in two stages, the Adult Literacy and Life Skills Survey (ALL) which was known in Canada as the International Adult Literacy and Skills Survey (IALSS). Designed to provide information about the skills of the adult populations, ALL measured the prose, document, and numeracy skills of 16- to 65-year olds in 10 developed countries. Canada participated in the first stage, in 2003, and PIAAC builds on that participation.

Canada's skills distribution in 2003 and 2012

Charts 4.1a and 4.1b present the skills distribution in Canada for ALL in 2003 and PIAAC in 2012. For literacy, Canadians scored an average of 280 in 2003, with 14% at Level 1 or below, and 18% at Level 4 or 5. The average in 2012 was 273, with 17% at Level 1 or below, and 14% at Level 4 or 5.

For numeracy, the pattern is very similar. Canadians scored an average of 272 in 2003, with 18% at Level 1 or below, and 14% at Level 4 or 5. The average in 2012 was 266, with 23% at Level 1 or below, and 13% at Level 4 or 5.

More in-depth study is necessary to reach an understanding of what the distribution of skills described above reveals about skills and changes in skills over time.²⁰ Some potential areas under consideration for future analysis are outlined below.

- *The compositional shifts of the Canadian population* - Age, educational attainment, and labour force participation can all affect these results, as can language abilities, and levels of immigration. All or some of these factors may have changed considerably in the time between the two surveys, and the impact of these changes is yet unclear.
- *Use of skills in the information society* - It should be remembered in this regard that skills on their own do not account for proficiency; how, when, and how often these skills are used — in the workplace, at home, and in the public domain — are also contributing factors. The acceleration of computer use in society, even within such a comparatively short period as 10 years, may have an impact on the use and maintenance of literacy and numeracy skills. This in turn could manifest itself in proficiency scores.

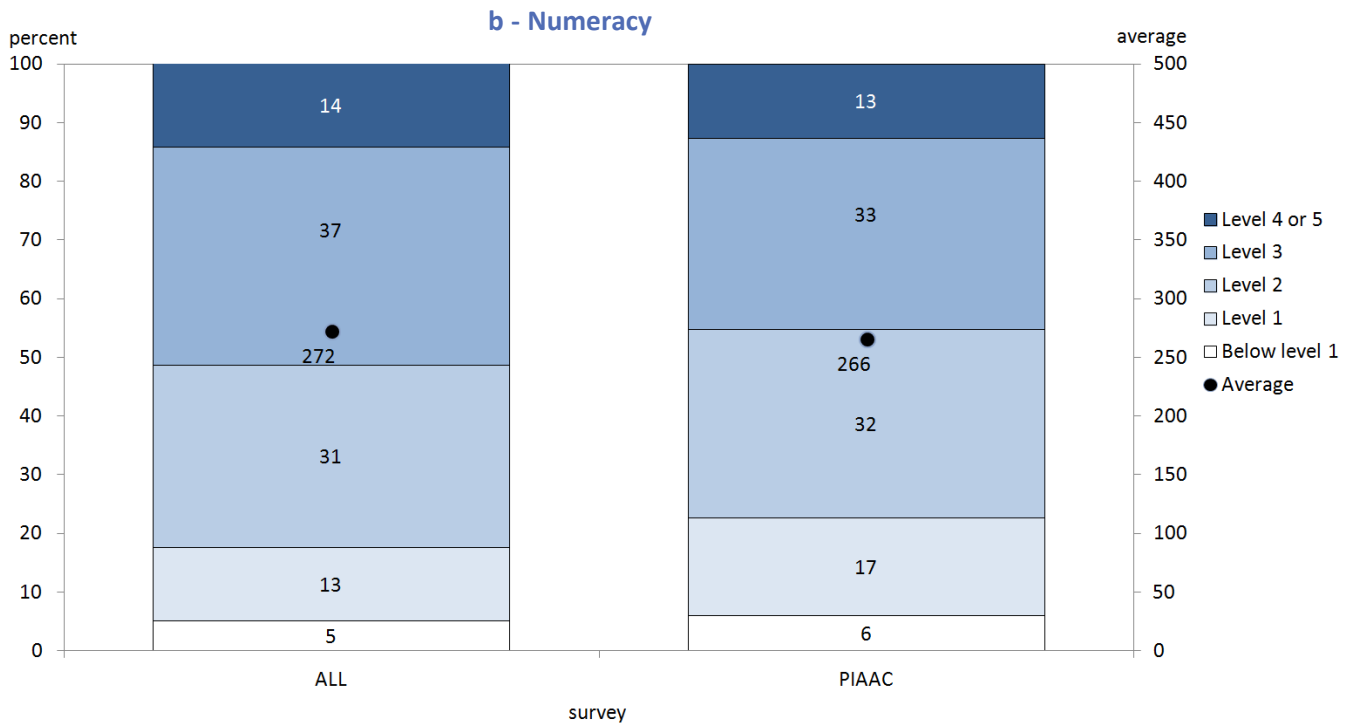
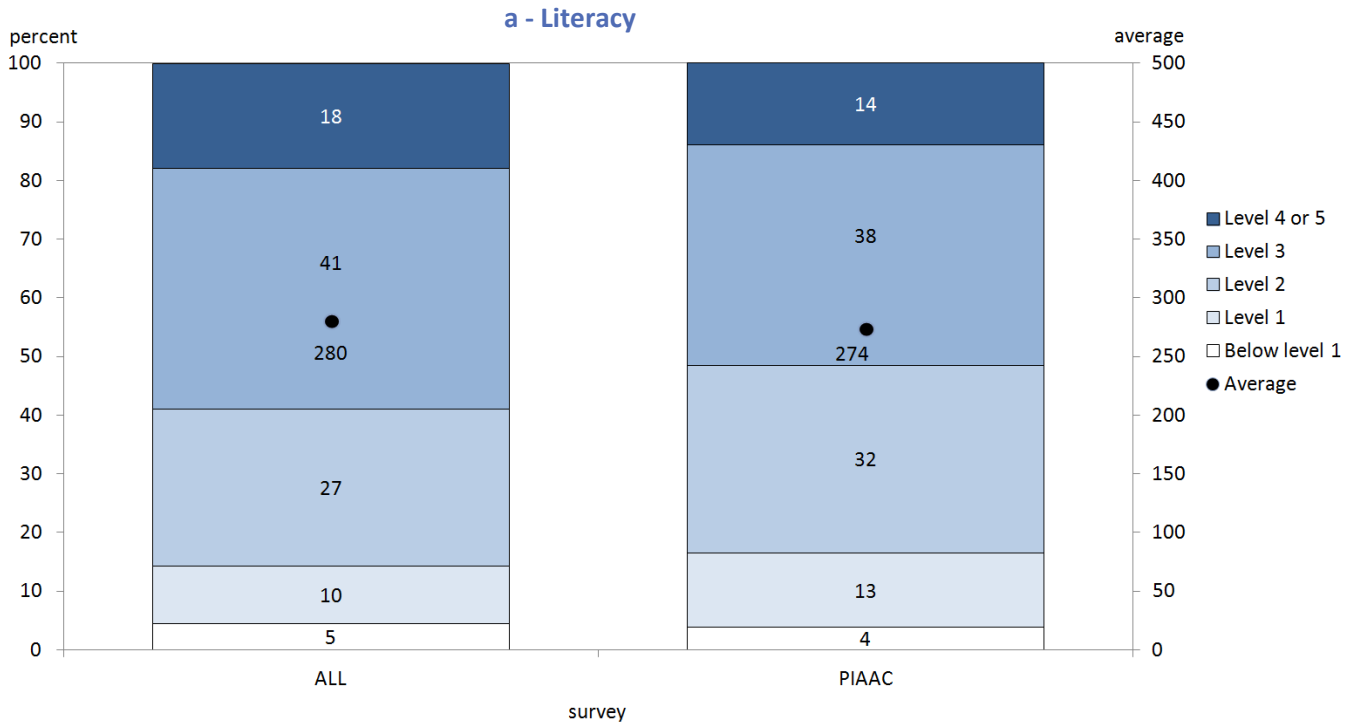
In light of the foregoing discussion, it is recognized that these results serve as the foundation for further analysis of literacy and numeracy both internationally and nationally.

19. These results use the re-scaled literacy and numeracy score.

20. It was found at the international level that the variation in country results, as well as the magnitude of those changes, signalled the need for further analysis (OECD 2013b). OECD will study the issue in a separate publication in order to obtain a better understanding of what the variations tell us. Canada is following suit with OECD, recognizing that deeper analysis is required both internationally and nationally before drawing conclusions about the differences in scores in literacy and numeracy over the past decade.

Chart 4.1

Averages and proficiency levels of population aged 16 to 65 in ALL and PIAAC, Canada, 2003 and 2012



Sources: The Programme for the International Assessment of Adult Competencies, 2012 and International Adult Literacy and Skills Survey, 2003. See Table B.4.1.

Conclusion

Data collected by OECD's Programme for the International Assessment of Adult Competencies provides a major foundation for understanding what skills people have and how those skills are being used - in the classroom, the workplace, and in our everyday lives. It focuses on the key "information-processing skills" — literacy, numeracy, and problem solving in technology-rich environments — needed in a modern knowledge-based society where ICT permeate social, economic and cultural spheres. It also examines the contexts in which they are properly understood. This report presents a first look at results of PIAAC for Canada.

Canada in the International Context

- Compared to other participating OECD countries, Canada ranks at the average in literacy, below the average in numeracy, and above the average in PS-TRE.
- Moreover, a high proportion of Canadians engage with ICT, and a considerable proportion perform at the highest level of proficiency in literacy and PS-TRE compared to the OECD average.
- The findings also show that a significant proportion of Canadians are at the lowest level of proficiency in literacy, numeracy, and PS-TRE when compared to the OECD average.
- Furthermore, 10% of Canadians have limited computer skills.

Results within Canada

- Literacy and numeracy scores are highest in the 25-to-34 age cohort, and are lower among the older age groups. Individuals aged 16 to 24 and 25 to 34 are the most proficient in PS-TRE.
- Overall, women and men display similar proficiencies in literacy and in PS-TRE, but men have higher numeracy skills across all ages.
- Educational attainment is a key determinant of information-processing skills. Higher education is not only associated with higher scores in literacy, numeracy, and PS-TRE; it also appears to attenuate the difference in skills between younger and older age groups. This is especially true among individuals with postsecondary education at the bachelor's degree level or higher.
- In general, the employed population demonstrates greater information-processing skills than those who are unemployed or not in the labour force. While the literacy and numeracy skills of the latter two populations are similar, those not in the labour force show lower PS-TRE skills than the unemployed. However, there is also a substantial proportion of adults who are unemployed or not in the labour force who show high levels of proficiency in all three domains.
- Workers in managerial and professional occupations display greater information-processing skills than workers in other types of occupations. Moreover, those with the greatest information-processing skills are workers in managerial and professional occupations with a bachelor's degree or higher, and represent the largest group of workers in Canada.
- The results indicate that information-processing skills of Aboriginal populations, immigrants, and official-language minority populations vary considerably across provinces and territories — to the extent that discussion of these populations at a national level is only meaningful when it acknowledges the profound differences at the local level. Even a glimpse at these first results demonstrates the need for further research on how skills vary in relation to the socio-demographic characteristics of these populations, as well as the geographic and cultural contexts in which they live.
- A snapshot of literacy and numeracy skills in 2003 and 2012 shows differences in scores and proficiency levels for literacy and numeracy. However, more in-depth analysis is needed to better understand these differences. Canada, as well as OECD, at the international level, will conduct further analyses.

PIAAC is a rich data source that belongs to all Canadians. While it can be used to generate a broad picture of skill levels in Canada and internationally, its greatest value lies in its level of detail. It provides data on a whole host of factors — educational, social, and economic — that inform our understanding and analysis of skills. These factors are interconnected, and they influence how skills are developed and used, as well as how they evolve throughout life.

This first look at the results points to the full potential that the data holds. The data is intended to be widely used by individuals, researchers, stakeholders, and governments — all of whom have a role in shaping how we adapt to a knowledge-based economy and to an ever-changing technological environment. Developing the skills needed to function in these environments will determine our well-being not only as individuals, but as a society; and not only for today, but for the future.

Glossary

Literacy

PIAAC defines literacy as “understanding, evaluating, using and engaging with written texts to participate in society, to achieve one’s goals, and to develop one’s knowledge and potential” (OECD 2012).

Numeracy

PIAAC defines numeracy as “the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life” (OECD 2012).

Problem-solving in technology-rich environments (PS-TRE)

PIAAC defines problem solving in technology-rich environments (PS-TRE) as the ability to use “digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks” (OECD 2012).

Reading Components

To provide more detailed information about adults with low literacy skills, the literacy assessment in this survey is complemented by a test of “reading component” skills. These are the basic set of decoding skills that enable individuals to extract meaning from written texts: knowledge of vocabulary, ability to process meaning at the level of the sentence, and fluency in reading passages of text (OECD 2012).

Module of the Use of Skills

The PIAAC Module of the Use of Skills is contained within the Background Questionnaire and asks adults who are employed about a number of generic skills they use in the workplace. It asks adults how intensively and how frequently they use these skills at work. Information is also collected about four broad categories of generic work skills: cognitive skills, interaction and social skills, physical skills, and learning skills.

Background Questionnaire

The international “master” version of the questionnaire used in PIAAC can be accessed at www.oecd.org/dataoecd/1/41/48442549.pdf. Each country adapted questions to reflect national circumstances in domains such as educational attainment and participation, labour-force participation and employment, where institutional structures were nationally specific or where there were national protocols for collecting data. Countries also had the opportunity to add a small number of “national” questions to the national versions of the background questionnaire. The Canadian version of the PIAAC background questionnaire can be accessed at www23.statcan.gc.ca/imdb/p2SV.pl?Function=getInstrumentLink&SurvItem_Id=132267&Query_Id=132269&Query=instance&lang=en&db=imdb&adm=8&dis=2.

ICT core

The mastery of foundational ICT skills is a prerequisite for proficiency in problem solving in technology-rich environments. Respondents with some experience of computer use were directed to the computer-based assessment where they took a short test of their ability to use the basic features of the test application (use of a mouse, typing, use of highlighting, and drag and drop functionality). Those who “failed” this component were directed to the pencil and paper pathway.

Opted out of the CBA

Respondents with some computer experience who opt out of taking the CBA without first attempting it and are taken to the paper-based assessment.

No computer experience

Respondents with no experience in using computers, as indicated by their response to the relevant questions in the background questionnaire, were directed to the pencil and paper version of the assessment.

PIAAC non-respondents

In Canada, a proportion of respondents were unable to undertake the assessment for literacy-related reasons such as being unable to speak or read in English or French. Some of these respondents completed the background questionnaire, or key parts of it, presumably with the assistance of an interviewer who spoke the respondent's language, a family member or another person. In the case of respondents who completed at least 5 questions in the background questionnaire, proficiency scores have been estimated in literacy and numeracy only. In Canada, this group is known as **uncategorized**, and totals 330 respondents, representing 1.2% of Canada's total sample.

Others were not able to respond to the background questionnaire, or responded to less than 5 questions in the background questionnaire. For these respondents, known as **literacy-related non-respondents**, the only information collected was that concerning their age, sex, and, in some cases, highest educational attainment. In Canada, this group totals 231 cases, and represents 0.9% of the total sample.

Immigrants

An immigrant is a person who is, or has ever been, a landed immigrant/permanent resident. **Recent immigrants** are defined as those immigrants who have been in Canada since 2002 (10 years or less). **Established immigrants** are those immigrants who arrived in Canada before 2002 (more than 10 years).

Aboriginal

In this report, Aboriginal peoples are identified as those respondents living off reserve who self-identified as being Aboriginal, that is, First Nations, Métis or Inuit.

Official language minority population

This population was based on mother tongue — that is, the first language learned at home in childhood and still understood, and refers to people living in a minority setting. Those in provinces outside Quebec have French as mother tongue; those in Quebec have English as mother tongue.

Anglophone

In this report, an Anglophone is an individual with either English or English and another language than French as mother tongue.

Francophone

In this report, a Francophone is an individual with either French or French and another language than English as mother tongue.

Population Centre

A population centre is defined as an area with a population of at least 1,000 and a density of 400 or more people per square kilometre. All areas outside population centres are defined as rural area. Population centres are divided into three groups based on the size of their population to reflect the existence of an urban-rural continuum:

- Small population centres, with a population of between 1,000 and 29,999;
- Medium population centres, with a population of between 30,000 and 99,999;
- Large urban population centres, consisting of a population of 100,000 and over.

Highest educational attainment

The highest level of education ever completed. Education is defined as formal education provided in the system of schools, colleges, universities and other formal educational institutions. Educational attainment is based on the 1997 International Standard Classification of Education (ISCED) coding developed by UNESCO. Includes every type of education associated with obtaining a certificate or diploma the respondent has ever successfully completed.

- **Less than high school diploma:** Respondents who have either had no formal education or whose highest level of schooling successfully completed includes Elementary school, or Jr High/Middle School. In terms of ISCED classification, this group includes: No formal qualification or below ISCED 1, ISCED 1, and ISCED 2.
- **High school diploma:** Respondents whose highest level of schooling successfully completed includes Senior High School, Adult secondary school, or Upgrading programs or courses. In terms of ISCED classification, this group includes: ISCED 3C shorter than 2 years, ISCED 3C 2 years or more, ISCED 3A-B, and ISCED 3 (without distinction A-B-C, 2 years or more).
- **Postsecondary education - below bachelor's degree:** Respondents whose highest level of schooling successfully completed includes non-university certificate or diploma from a college, school of nursing, or technical institute; trade/vocational certificates; apprenticeship certificates; CEGEP diploma or certificates; university transfer programs; and university certificate or diploma programs below bachelor's degree. In terms of ISCED classification, this group includes: ISCED 4C, ISCED 4A-B, ISCED 4 (without distinction A-B-C), and ISCED 5B.
- **Postsecondary education - bachelor's degree or higher:** Respondents whose highest level of schooling successfully completed includes bachelor's degree, university certificate above bachelor level, first professional degree (medical, veterinary medicine, dental, optometry, law and divinity), Master's, and Ph.D. In terms of ISCED classification, this group includes: ISCED 5A: bachelor degree, ISCED 5A: master degree, and ISCED 6.

Occupation

The occupation categories in this report are derived from the International Standard Classification of Occupations (ISCO), a classification published by the International Labour Organization (ILO), and applied to ensure cross-country comparability of occupations in PIAAC. The basis for the classification is the nature of the *job* and the required *skill* level, where a job is defined as the set of tasks and duties to be performed, and skills are the abilities to carry out the tasks and duties of such job.

Both PIAAC international and pan-Canadian reports applied the same derived variable for the occupation categories.

- **Managerial and professional occupations** (skilled occupations) include: legislators, senior officials, and managers (ISCO 1); professionals (ISCO 2); and technicians and associate professionals (ISCO 3).
- **Service and support occupations** (semi-skilled) include: clerical support (ISCO 4) and service and sales (ISCO 5) workers.
- **Trade, production and manufacturing occupations** (semi-skilled) include: skilled agricultural and fishery workers (ISCO 6); craft and related trades workers (ISCO 7); plant and machine operators and assemblers (ISCO 8).
- **Manual and other service occupations** (low skilled) include: elementary occupations (ISCO 9) such as cleaners; agricultural, forestry, and fishery labourers; as well as those in mining, construction, manufacturing and transport.

Further information on the occupational classifications applied in PIAAC can be found at ILO.²¹

Employment Status

Employed

Employed respondents were those who in the week prior to PIAAC: (1) did at least one hour of paid work, either as an employee or self-employed, or (2) were away from a job they plan to return to, or (3) did at least one hour of unpaid work for a business they or a relative owns.

Unemployed

Unemployed respondents did not identify themselves in any of the employed categories, **and** they indicated they were actively looking for work in the 4 weeks prior to PIAAC, as well as able to begin work within 2 weeks. The unemployed population also consists of respondents who were waiting to begin a job for which they had been hired and would begin employment in the subsequent 3 months.

Not in the labour force

In PIAAC, those “out of the labour force” were respondents who met none of the employment conditions **and** did not actively look for work in the 4 weeks prior to PIAAC, or would not begin work for more than 3 months. The out of the labour force population also consists of respondents who did not take active steps to find a job and were not looking for work or available to begin work within 2 weeks of the survey.

21. International Labour Office. (2012). “Structure, group definitions and correspondence tables”, *International Standard Classification of Occupations 2008*, Volume I, International Labour Organization, www.ilo.org/wcmsp5/groups/public/-dgreports/-dcomm/-publ/documents/publication/wcms_172572.pdf.

International Labour Organization (ILO). (2004). “Introduction to occupation classifications”, *International Standard Classification of Occupations*, International Labour Organization, www.ilo.org/public/english/bureau/stat/isco/intro.htm.

Annex A - Methodology

Canada is a participant in the Programme for the International Assessment for Adult Competencies (PIAAC). The Canadian component was carried out in accordance with the standards in the PIAAC guidelines. These standards set out the minimum requirements for the survey design and the implementation of all phases of the survey, from planning to documentation.

Target population

The target population consists of all Canadian residents aged 16 to 65 inclusive, with the exception of long-term residents of collective dwellings (institutional and non-institutional), families of members of the Armed Forces living on military bases, and people living on Indian reserves. Because of operational constraints, sparsely populated regions were also excluded from the target population. Together, these exclusions made up no more than 2% of the total population of Canada, which easily met the international requirement that less than 5% of the target population be excluded from the survey.

Coverage of the survey's target population by the 2011 Census of Population was determined to be about 96% at the national level and between 94% and almost 100% at the provincial/territorial level (except for Nunavut). Table A.1 shows preliminary estimates (as of March 2013) of the coverage rate of the population aged 15 to 64 based on 2011 Census coverage studies²² for Canada and each province and territory. It should be noted, however, that the fact that someone was missed in the Census does not mean that he or she was also missed in the PIAAC, since Statistics Canada's interviewers had to prepare a roster of the members of the selected households before choosing the respondent.

Sampling frame

The response databases of the 2011 Census of Population and Housing and the National Household Survey (NHS) were used as sampling frames to construct the PIAAC sample.

These databases provided recent information about dwellings' usual residents so that people who are members of the survey's target populations could be selected. The Census was used for the general sample, the 16-to-24 age group in British Columbia, and linguistic minorities. NHS data were used to identify recent immigrants, Aboriginal people and Métis people. Only dwellings of Census or NHS respondents and dwellings whose residents were members of the target populations according to Census or NHS data were considered.

Sampling plan

A multi-stage probabilistic sampling plan was used to select a sample from each frame. The design produced sufficiently large samples for both official languages (English and French). In addition, the sample size was augmented to produce reliable estimates for a number of population subgroups, including young people (the 16-to-24 age group in British Columbia), linguistic minorities (Anglophones in Quebec and Francophones in New Brunswick, Ontario and Manitoba), immigrants who had been in Canada 10 years or less (i.e., since 2002), urban Métis in Ontario and urban Aboriginals.

Table A.1
Estimated Census coverage rate of the population aged 15 to 64, Canada, provinces and territories, 2011

Region	Census coverage
	rate percent
Canada	96.4
Newfoundland and Labrador	97.0
Prince Edward Island	96.1
Nova Scotia	96.4
New Brunswick	98.6
Quebec	97.8
Ontario	96.1
Manitoba	97.4
Saskatchewan	96.6
Alberta	94.9
British Columbia	96.0
Yukon	94.1
Northwest Territories	94.6
Nunavut	91.5

Sources: 2011 Census Reverse Record Check, 2011; Census Overcoverage Study, preliminary results, March 2013.

22. Undercoverage estimates for the population aged 16 to 65 were not available at the time of writing.

In the territories, the initial sample was designed so that the final sample would contain at least 450 aboriginals in Yukon and Northwest territories and 600 in Nunavut. Note that initially, aboriginals in the territories were not explicitly targeted as such using their answers to the NHS, but households were stratified and sample sizes calculated in such a way that a sufficient number of aboriginal individuals would be interviewed to produce reliable estimates in each territory. As collection was conducted however, reports showed that these targets would not be met in Yukon and Northwest Territories. As a consequence, the initial sample in Yukon has been replaced by another random sample selected among NHS responding households explicitly targeting aboriginals according to the same criteria used in the provinces. In Northwest Territories, a portion of the sample selected in Yellowknife has been replaced by a random sample selected in communities known to have a higher percentage of aboriginals in their population.

In the provinces,²³ the primary sampling units (PSUs) were defined by updating the PSUs constructed for the 2003 International Adult Literacy and Skills Survey (IALSS).

At the time, Statistics Canada's Generalized Area Delimitation System was used to create PSUs with a sufficiently large population based on the number of dwellings within limited, reasonably compact areas. A general indication of the population's level of education according to the 1996 Census had been added to generate PSUs that reflected the distribution of levels of education in the province.

Since the enumeration area geography used in the 2001 Census was replaced, additional work was required to define the boundaries of each PSU in terms of dissemination areas before stratification and selection.

Using these boundaries and exclusions similar to the IALSS exclusions, the PSUs were allocated to the following strata: A (urban), B (rural) or E (excluded). PSUs were excluded when they were too large, did not have enough residents or were too far north. Reserves were also excluded. Further clean-up resolved cases of PSUs that were in more than one stratum. A few PSUs were divided or combined with others so that they would have an area and number of dwellings comparable to other PSUs.

In addition, 2006 Census data and the PIAAC's sample and target population sizes were used to update the stratum boundaries. Communities were formed to derive these stratum boundaries using dissemination areas or urban areas, depending on whether it was in a census metropolitan area (CMA) or the area of the CMA or urban area was greater than 5,625 km.²³ The 2006 Census long questionnaire (2B) counts and the PIAAC's final sample sizes were also used to divide the communities into an urban stratum (A) and a rural stratum (B). The sample was divided among the PSUs on a preliminary basis using a Neyman allocation. Communities in which at least 15 dwellings had been selected were assigned to the urban stratum.

Stratification was then completed by assigning some PSUs to a new stratum, C, for which they were selected with certainty because of their size. The PSUs chosen for this stratum were those in which at least 80 dwellings had been selected for the general and special samples taken together, or in which 40 dwellings had been selected for a subsample.

After the final stratification was determined, a sample of PSUs was selected at the first stage in the rural stratum by sampling with probability proportional to the number of eligible persons in the PSU. In each province, the sample was distributed among the strata in proportion to actual population size, with a conservative design effect of 2.0 for the rural stratum and 1.5 for the urban stratum. The latter adjustment was made to compensate for the effect that the multistage sample design has on the variance of the estimates produced with the survey data.

In the urban stratum, the number of dwellings was estimated by allocating the initial sample size to strata A and C on the basis of the proportion of the general sample or the subsample for that PSU. In the rural stratum, the same sample size was allocated to all PSUs in the sample to equalize collection workloads.

In the urban stratum in provinces, as well as in the three territories, two-stage sampling was used. In the

²³In the territories, a two-stage sample design has been used. As a consequence, PSUs are constituted by households, and not by geographical areas.

first stage, households were selected systematically with probability proportional to size. Size was defined as the number of adults aged 16 to 65 in a household based on 2011 Census data, at any time during the PIAAC collection period. The upper limit was set at four eligible adults for the core sample and three for the supplementary samples. In the second stage, the computer-assisted personal interview (CAPI) application used a simple random sampling algorithm to select one person from the roster of eligible adults that the interviewers made for each household during collection.

In the rural stratum, three-stage sampling was used. In the first stage, PSUs were selected with probability proportional to the number of adults aged 16 to 65 according to the 2011 Census. In the second and third stages, the selection method was the same as the one used for the urban stratum.

Sample size

The PIAAC sample was constructed from a general sample of 5,400 units, which were distributed among the provinces using a Kish allocation (Kish 1976) to obtain a sample of at least 5,000 English-speaking respondents at the national level. Then, 3,600 units from Quebec were added to produce a sample of 4,500 French-speaking respondents (required to meet the international consortium's standards). Supplementary units were added to this sample to produce more precise estimates for some provinces and territories and some subpopulations of interest.²⁴ Following adjustments for expected non-response and target population mobility, an overall sample of nearly 50,000 units was obtained. The samples were selected one by one in sequence, following the core sample. After each sample was selected, the households chosen from the frame were removed before the next selection process, which made the samples dependent. Sequential selection of several samples in the same province or territory can be considered multiphase sampling.

In the final stage before sample selection, the size of the primary samples was augmented to compensate for a 6% vacancy rate among the selected dwellings and a 4% rate of households with no eligible members for the general sample, which made for a combined rate of approximately 11%.

The supplementary samples covered populations with specific characteristics, and because of natural mobility, a household selected for inclusion in one of these samples was more likely to have no eligible members at the time of contact with the interviewer, compared with the general sample. For example, persons aged 16 to 65 who moved out of a dwelling selected in the general sample shortly after the Census are very likely to have been replaced by other persons in the same age group; however, recent immigrants in that age group are less likely to have been replaced by other recent immigrants before the PIAAC was conducted. For this reason, the percentages used for the supplementary samples were different from the percentage used for the general sample. For example, the combined rate of vacant dwellings containing no members of the target group for the official-language-minorities sample was set at 15% in New Brunswick and 20% in Quebec, Ontario and Manitoba. A 65% unique response rate was also assumed, along with an 8% unique rate of refusal to share.²⁵

Table A.2 shows the expected number of 2012 PIAAC respondents by sample type for Canada and the provinces and territories.

24. As noted previously, these supplementary units were added to meet the needs of federal, provincial and territorial government departments and ministries.

25. The rate of refusal to share is the proportion of persons who responded to the survey but withheld consent for the transmission of their responses to organizations other than Statistics Canada and to the organizations responsible for processing the data collected. Those persons are treated as non-respondents.

Table A.2
Expected distribution of PIAAC respondents by sample type, Canada, provinces and territories, 2012

Region	General sample	Supplementary samples number	Total
Canada	18,091	7,176	25,267
Newfoundland and Labrador	1,399	0	1,399
Prince Edward Island	893	0	893
Nova Scotia	1,272	0	1,272
New Brunswick	1,098	368	1,466
Quebec	4,570	490	5,060
Ontario	2,635	2,530	5,165
Manitoba	922	1,225	2,147
Saskatchewan	913	600	1,513
Alberta	902	240	1,142
British Columbia	907	1,723	2,630
Yukon	900	0	900
Northwest Territories	900	0	900
Nunavut	780	0	780

Source: Programme for the International Assessment of Adult Competencies, 2012.

Supplementary samples

The supplementary samples were constructed with the Census or NHS response database. A dwelling could be included in one of these samples if data from the survey (the Census or the NHS) indicated that it contained at least one person with the desired characteristics. The criteria used for each supplementary sample are shown in List A.1.

At the time of the visit, the selected household was interviewed, and the interviewer checked that it was still eligible—i.e., that it had at least one person from the target population—using the same questions as the Census or the NHS. If more than one person was eligible, one of them was chosen at random. If the household was ineligible, it was coded as out of scope.

As a result, some households (for example, some of those selected in the Métis sample) were reported as out of scope because they no longer had any members with the desired profile.

Note that some members of the specific populations (recent immigrants, Aboriginals and so on) are also present in the sample of the general population, since they are members of the Canadian population aged 16 to 65.

List A.1**Definitions used to identify households containing person of interest for the PIAAC supplementary samples, according to the Census or the NHS****Supplementary samples selected with Census data****Persons aged 16 to 24 (British Columbia):**

Age according to Question 3 of Census questionnaire 2A.

Official language minorities (New Brunswick, Quebec, Ontario, Manitoba):

English: English is the person's only mother tongue according to Census Question 9.

French: French is the person's only mother tongue according to Census Question 9.

Supplementary samples selected with National Household Survey (NHS) data, stratum A (urban) only**Immigrants in Canada 10 years or less (Quebec, Ontario, Alberta, British Columbia):**

Persons who did not mark "Canada, by birth" (NHS Question 10) who have ever had landed immigrant status (NHS Question 11) and first became landed immigrants between 2002 and 2011 inclusive (NHS Question 12).

Métis (Ontario):

Persons who reported they were Métis and did not mark the "No, not an Aboriginal person" response in NHS Question 18.

Aboriginals (Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia), Replacement sample in Yukon:

Persons who reported they were North American Indians, Métis or Inuit and did not mark the "No, not an Aboriginal person" response in NHS Question 18.

Data collection**PIAAC survey design, assessment design and application**

The Programme for the International Assessment of Adult Competencies (PIAAC) is a survey of adult skills which is constructed of three main stages: the background questionnaire (BQ), the Core modules and the direct assessment part (direct assessment of literacy, numeracy and problem solving in technology-rich environments). While conceived primarily as a computer-based assessment (CBA), the option of taking the literacy and numeracy components through paper-based assessment (PBA) had to be provided for those adults who had insufficient experience with computers to attempt the assessment in CBA mode.

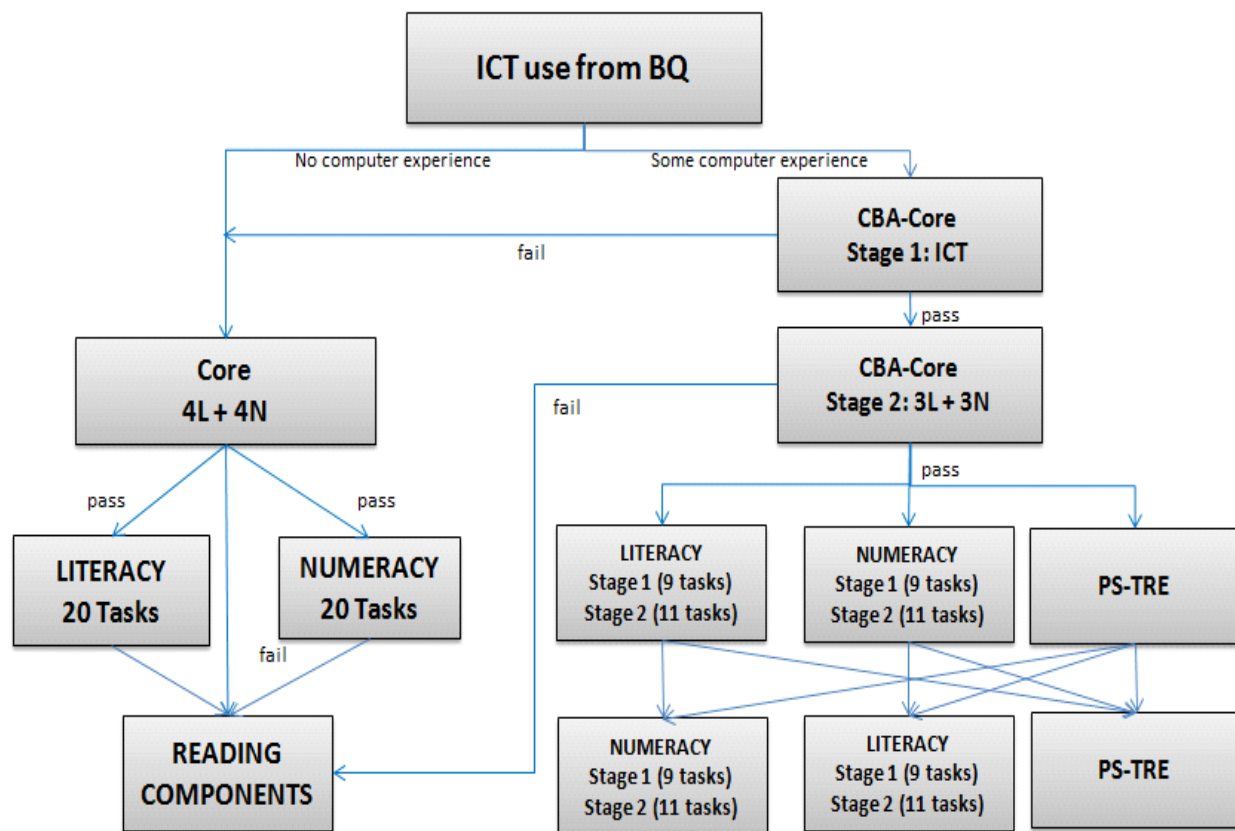
Respondents were initially asked to complete a set of basic questions about all household members, including their gender and age, in order to permit the random selection of one member from each dwelling. This "screener" collected as required, more demographic information aimed at identifying targeted sub-populations for the survey. The background questionnaire (BQ) was then asked of the selected respondent. The BQ included questions about respondents' computer experiences, which were essential to branch them to either the paper or computer assessments at the end of the BQ. Respondents with no computer experience, based on BQ questions, and respondents who failed the Information and Communication Technology (ICT) core assessment were routed to the paper branch. Respondents with some computer experience also had the option to opt out of the CBA without attempting it and take the PBA. Most respondents, however, were routed to the computer branch of the survey. At the beginning of the survey, respondents were given the

option of completing the survey in the official language of their choice (English or French). Prior to beginning the assessment, respondents were again asked in which of the official language they preferred to complete the assessment; from this point forward, respondents could not change their mind and had to complete the entire assessment in the language selected at that time. This necessitated a relatively complex design, which is presented graphically in the Figure A.1 below.

As seen in Figure A.1, there are several pathways through the assessment. Respondents with no experience in using computers, as indicated by their response to the relevant questions in the background questionnaire, were directed to the pencil and paper version of the assessment. Respondents with some experience of computer use were directed to the CBA where they took a short test of their ability to use the basic features of the test application (use of a mouse, typing, use of highlighting, and drag and drop functionality) – the CBA core Stage 1. Those who “failed” this component were directed to the pencil and paper pathway.

Respondents taking the computer path then took a short test (the CBA core Stage 2) composed of three literacy and three numeracy items of low difficulty to determine whether or not they should continue with the full assessment. Those who “failed” this module were directed to the reading components assessment. Respondents who passed this module continued on to take the full test and were randomly assigned to a first module of literacy, numeracy or problem solving items. Following completion of the first module, respondents who had completed a literacy module were randomly assigned to a numeracy or problem-solving

Figure A.1
Design of the PIAAC survey



Source: Programme for the International Assessment of Adult Competencies, 2012.

module, respondents who had completed a numeracy module were randomly assigned to a literacy or problem-solving module, and respondents who had completed a problem-solving module were randomly assigned to a literacy, a numeracy or a second problem-solving module.

The assessment design assumed that the respondents taking the PBA path would be either those who had no prior experience with computers (as assessed on the basis of responses to the relevant questions in the background questionnaire) or those who failed the CBA core. It was, however, possible for respondents with some computer experience to take the PBA pathway if they refused the CBA.

Respondents taking the pencil and paper path first took a “core” test of four simple literacy and four simple numeracy items. Those who passed this test were randomly assigned to a module of either 20 literacy tasks or 20 numeracy tasks. Once the module was completed, respondents were given the reading-components test. Respondents who failed the initial “core” test proceeded directly to the reading-components test.

In Canada, the majority of respondents had enough computer skills to carry out the PIAAC assessment on the computer. Approximately 85% of respondents completed the Computer-based Assessment (CBA), and 15% completed the Paper-based Assessment (PBA).

The average times taken to complete the different stages of the PIAAC survey in Canada are as follows:

- Background Questionnaire (BQ): approximately 45 minutes;
- Paper-based Assessment (PBA): approximately 30 minutes;
- Reading Component Assessment: approximately 20 minutes;
- Computer-based Assessment (CBA): approximately 60 minutes.

PIAAC adaptive design

One of the unique aspects of the PIAAC was the adaptive design of the computer branch of the survey within the domains of literacy and numeracy.

Respondents were directed to different blocks of items on the basis of their estimated ability. Individuals who were estimated to have greater proficiency were more likely to be directed to groups of more difficult items than those who were estimated to be less proficient. Each of the literacy and numeracy modules was composed of two stages containing testlets (groups of items) of varying difficulty. Stage 1 contained three different testlets of nine items each, while Stage 2 contained four different testlets of 11 items each. Respondents’ chances of being assigned to testlets of a certain difficulty depended on their level of educational attainment, whether their native language was the same as the test language (i.e. whether the language of the test was the first language or birth language of the respondent), their score on the literacy/numeracy core (CBA core Stage 2) and, if relevant, their score on a Stage 1 testlet.

Problem Solving in Technology Rich Environment (PS-TRE) is unique because of the nature of the domain; there was only one testlet per module. It was organized as two fixed sets of tasks: seven tasks in Module 1 and seven in Module 2.

Respondents directed to the paper booklet path directly started with a Paper Core booklet consisting of a set of items designed to determine whether they have the basic literacy and numeracy skills to proceed to the main assessment. This was scored by the interviewer, and if the respondent correctly answered a sufficient number of questions (4), they were then randomly assigned either a literacy or numeracy booklet.

Finally, PIAAC can provide more information about individuals with low proficiency levels by assessing reading component skills. This portion of the paper assessment was an international option and Canada was one of the participating countries. It measured basic reading skills using some short sections of exercises, word meaning, sentence processing, and basic passage comprehension.

With the exception of the reading components section (the time taken by respondents to complete the reading components tasks was recorded), no time limit was imposed on respondents completing the assessment, and they were urged to try each item whether it be on the computer or paper booklets. Respondents were given a maximum leeway to demonstrate their skill levels, even if their measured skills were minimal.

PIAAC quality control

To ensure high quality data, the international Technical Standards and Guidelines were followed and supplemented by adherence to Statistics Canada's own internal policies and procedures. The interviews were conducted in the respondent's home in a neutral, non-pressured manner. Interviewer training and supervision were provided, emphasizing the importance of precautions against non-response bias. Interviewers were specifically instructed to return several times to non-respondent households in order to obtain as many responses as possible. Extensive effort was expended to ensure that the home address information provided to interviewers was as complete as possible, in order to reduce potential household identification problems. Finally, the interviewers' work was supervised by using frequent quality checks at throughout collection and by having help available to interviewers during the data collection period. In total, Canada employed 786 interviewers over the duration of the survey.

The paper-based assessment was scored and captured in Statistics Canada. Explicit guidelines and a standard data capture tool were provided by the International Consortium to complete this work. As a condition of participation in the international study, it was required to capture and process files using procedures that ensured logical consistency and acceptable levels of data capture error. Specifically, complete verification of the captured scores (i.e., enter each record twice) was done in order to minimize error rates.

The International Consortium regarded Quality Control (QC) as an integral component to the overall success of the PIAAC survey. Various guidelines were established to ensure that the data collected by participating countries were reliable and valid.

The guidelines stipulated that throughout collection PIAAC countries routinely conduct validations to verify that an interview was indeed conducted or attempted as reported by the interviewer. Countries were required to validate at least 10 percent of each interviewer's finalized work to ensure that the case was handled according to study procedures. Validation included completed cases and those finalized with other outcome codes, such as vacant or refusal. Validation cases were selected randomly.

In Canada, the Quality Control Validation was done by a Computer Assisted Telephone Interview (CATI). The interview consisted of a series of questions about the respondents experience with the PIAAC survey, and the responses were then compared to the PIAAC survey data to determine if:

- the data matched (month and year of birth; education; address; demographics on household members; etc);
- procedures were followed (length of interview; composure of interviewer; interviewer using laptop; respondent completing assessment; interviewer helping respondent);
- the correct outcome code was assigned (correct vacant/ no contact/ absent/ seasonal dwelling etc).

If inconsistencies were discovered, the interviewer's entire completed caseload was then selected and subject to further validation in order to ascertain whether other cases were also compromised.

PIAAC coding

Industry, occupation, and education variables were coded using standard schemes such as the International Standard Industrial Classification (ISIC), the International Standard Classification of Occupations (ISCO) and the International Standard Classification for Education (ISCED). Coding schemes were provided for all open-ended items, as were specific instructions about coding of such items.

PIAAC data collection period

Data collection began in 2011 with the planning of interviewer assignments by the regional offices coordinating the collection activities. The first contacts with respondents were initiated in November 2011 across the country and the last interviews were completed in June 2012, with all survey-related materials being returned to head office by August of 2012.

Scoring of tasks

The overall performance of items from the assessment was evaluated during the field test. The field test was used to evaluate scoring procedures, including scoring standards and scorer training for paper-based instruments and automated scoring procedures for the computer-based instruments. Items that did not appear to be working as expected were examined and either revised or replaced for the PIAAC main study.

For the large majority of respondents who took the assessment in its CBA format, scoring was done automatically. Manual scoring was necessary in the case of respondents taking the PBA version.

Computer-based instruments automated scoring procedures

The purpose of this section is to explain in detail the scoring procedures within the computer branch of the assessment, focusing on the CBA Core, CBA Module 1 and CBA Module 2:

- **The Core:** The word “core” is used in PIAAC to refer to two different sets of basic skills. Below are the scoring procedures for the CBA Core stages:
 - **CBA core Stage 1 (Basic computer skills):** In the computer branch, the CBA core Stage 1 focused on basic computer skills including clicking, typing, scrolling, dragging, using pull-down menus and highlighting – skills respondents needed to complete the CBA main assessment. Thus, this module considered whether the respondents completed the task and was scored based on the completion of the action rather than the correct content. For example, one of the tasks asked the respondent to select “May” from a pull-down menu. The task was scored correctly if he/she used the pull-down menu to select any month. Out of the six tasks, respondents had to complete at least four tasks to move to the next stage. That is, respondents had to receive a score of 4, 5 or 6 AND they had to complete the highlighting task. Respondents who failed to demonstrate the necessary basic computer skills were routed to the paper branch. A successful completion of the CBA core Stage 1 led respondents to the CBA core Stage 2.
 - **CBA core Stage 2 (Basic literacy and numeracy skills):** CBA core Stage 2 in the computer branch was designed to ensure that respondents had the basic literacy and numeracy skills necessary to proceed to the main assessment. CBA core Stage 2 contained six items with a passing score of at least 3; respondents with a score of 0, 1 and 2 were routed to the paper branch. For example to get a score of “4” a respondent had to answer 4 out of the 6 items correctly. The score received in the CBA core Stage 2 was used as a variable determining the choice of the first and second Testlet (i.e. Stage 1 and Stage 2 testlets) within Literacy and Numeracy.
- **The Modules:** The CBA main assessment assessed the domains of literacy, numeracy and problem solving. Each respondent took two modules (Module 1 and Module 2), which each included two stages; Stage 1 contained three different testlets of nine items each, while Stage 2 contained four different testlets of 11 items each.

For the computer branch, the selection of a domain (literacy, numeracy or problem solving) for the first module (Module 1) is random. After completing Module 1 (either the two testlets for literacy or numeracy or the problem-solving module), the respondent proceeded to Module 2; the selection between Module 1 and Module 2 was also based on random probabilities. As noted in section 6.6.2, each of the literacy and numeracy modules was composed of two stages containing testlets (groups of items) of varying difficulty. All items were scored automatically.

Below are the scoring procedures for the CBA Module Stage 1:

- **CBA Module Stage 1:** Respondents needed to answer the items of each stage of a given module to get a certain score. For instance, in literacy and numeracy, the possible values of the stage 1 score of a module (and the result of the answers to the related items) were 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9. E.g. to get a score “7” a respondent had to answer correctly seven out of the nine items. The Stage 1 score is used as a variable determining the test assignment for Stage 2 within Literacy and Numeracy.

Paper-based instruments scoring procedures

Persons charged with scoring received intense training on scoring responses to the paper-based items using the PIAAC scoring manual. To aid in maintaining scoring accuracy and comparability between countries, the PIAAC survey used an electronic bulletin board, where countries could post their scoring questions and received scoring decisions from the domain experts. This information could be seen by all participating countries, and they could then adjust their scoring. To further ensure quality, monitoring of the scoring was done in two ways.

First, a certain proportion of booklets had to be re-scored. A minimum of 600 sets of Core Booklet/Exercise Booklet 1 or Core Booklet/Exercise Booklet 2 had to have been double scored within each country. The first score was considered as the main score; the second was considered as the reliability score. In Canada 1,000 sets of English and 1,000 sets of French Core Booklet/Exercise Booklet 1 or Core Booklet/Exercise Booklet 2 were double scored. This accounted for about 43% of the total amount of booklets scored. The structure of the scoring design involved rescoring a large portion of booklets at the beginning and middle of the scoring process to identify and rectify as many scoring problems as possible. The goal in PIAAC scoring was to reach a within country inter-rater reliability of 0.95 (95% agreement) across all items, with at least 85% agreement for each item. In fact, most of the intra- country scoring reliabilities were above 95%. Where errors occurred, booklets were reviewed and problem questions associated with a systematic scoring error by a particular scorer were rescored.

Second, the Consortium developed a cross-country reliability study where a set of anchor booklets were used to check the consistency of scorers across countries and to ensure they were applying the same criteria when scoring the items. The anchor booklets consisted of a set of 180 “completed” English booklets that were scored and rescored by every country.

Once Canada met the requirements of the two reliability studies (Canada had a within-country agreement above 97% across items), the remaining Core, Exercise 1 and Exercise 2 booklets were single scored.

The section below explains the scoring procedures within the paper branch of the assessment, focusing on the paper core booklet (PPC), the literacy booklet (PP1), the numeracy booklet (PP2) and the reading components booklet (PRC):

- **PPC core (Basic literacy and numeracy skills):** the paper core booklet in the paper branch was designed to ensure that respondents had the basic literacy and numeracy skills necessary to proceed to the main paper-based assessment. The paper core contained eight items with a passing score of at least 4 (so scores 4, 5, 6, 7, and 8 were passing scores).
- In the **literacy booklet (PP1)** and the **numeracy booklet (PP2)** items were scored within Statistics Canada and each assigned a score of 1, 7 or 0. In general: A score of ‘1’ was assigned for a correct response, a score of ‘7’ was assigned for an incorrect response, and a score of ‘0’ was assigned if no response was provided.
- The **Exercise Booklet RC (Reading Components)** was not scored within Canada; instead a procedure known as response capture was required. For each part of the Reading Components assessment, actual responses given by the respondent were captured in appropriate scoring sheets. During the data processing at the International Consortium, a response key was applied that assigned consistently coded scores for all reading component items. The following scheme was used: 0 = Question refused / not done, 1 = Correct response, 7 = Incorrect response and 8 = Any other response.

Survey response and weighting

The Canadian PIAAC sample has a very complex design, involving stratification, multiple phases, multiple stages, systematic sampling, probability-proportional-to-size sampling, and several overlapping samples. It is also necessary to adjust for non-response at various levels. As a result, the estimation of population parameters and the corresponding standard errors depends on weighting coefficients, or weights. Two types of weighting coefficients were calculated: population weights, which are used to produce population estimates, and jackknife replicate weights, which are used to derive the corresponding standard errors.

Population weights

Since the PIAAC is a sample survey, each respondent was selected by means of a random process and represents a portion of the survey's target population. Each respondent's weight, i.e., the number of members of the target population that he or she represents, is calculated at the outset as the inverse of each person's probability of being selected in the sample. A sampling unit's overall probability of selection is the product of its probabilities of selection in all phases and stages of selection. The sequential selection of multiple samples in a province was taken into account by factoring in the probability that a unit selected in a given sample was not chosen in any previously selected samples. The initial weight was then adjusted to compensate for the various types of non-response in the survey.

There are four phases of weight adjustments for non-response: two apply to the weights before they are adjusted for the number of eligible members of the household, and two apply to the weights after that calculation.

For each type of weight adjustment, persons (respondents and non-respondents) with similar response probabilities were divided into response homogeneity groups (RHGs) for adjustment. For the adjustment of literacy-related non-response cases, the RHGs are composed of province–subsample combinations, because the number of literacy-related non-response cases in the sample is so small. For every other phase, in each province–subsample combination, an algorithm similar to the chi-square automatic interaction detection (CHAID) algorithm (Kass 1980) was used to form the RHGs. The RHGs were constructed so that each one had at least 30 households and a weighted response rate (or known eligibility rate for adjusting for the household's unknown eligibility at the household composition stage) of at least 40%.

The households selected in the sample were assigned to one of the following five response groups: respondent, literacy-related non-respondent (at this stage, only language problems were considered), non-literacy-related non-respondent, ineligible and unknown eligibility. They were allocated to the groups on the basis of the result codes selected by the interviewer when he or she contacted the people living in the selected dwellings and made a roster of the usual residents.

The first adjustment involves distributing part of the weight of dwellings of unknown eligibility among the dwellings that are ineligible (because they are vacant at the time of the interviewer's visit, they are being renovated, etc.). The second adjustment involves redistributing the weights of the dwellings of non-literacy-related non-respondents and ineligible dwellings among the weights of respondent dwellings.

After the roster of household members has been prepared and the respondent has been selected from the eligible members, a second code indicates whether the interview took place, and if not, why not. After the household composition stage, the members of a respondent household are in one of the following five response groups: respondent, literacy-related non-respondent, non-literacy-related non-respondent, ineligible member or disabled member.²⁶ The non-response adjustment stages that follow are applied to the weights, which reflect the number of eligible persons in the household.

The third non-response adjustment involves distributing the weights of disabled persons and selected non-respondents across the weights of respondents. Lastly, after the roster of household members is made, the fourth adjustment distributes the weights of pre-roster literacy-related non-respondents across the same type of non-respondents identified as persons selected to complete the survey.

²⁶This category includes only persons whose disability, such as deafness or blindness, was considered incommensurate with participation in the survey.

Because of the overlap of the populations associated with the various samples, the weights had to be combined so that estimates could be produced using all units from all samples. The situation is similar to that of a survey with multiple frames, except that in this case, the samples are dependent. The weights were combined using the Hartley method (Hartley 1962) for multiple frames: The entire sample was allocated on the basis of the subpopulations targeted in the supplementary samples, and the weights were adjusted using coefficients proportional to the size of the various samples within the partition.

Lastly, the weights for each province and territory were calibrated separately using the calibration variables shown in Table A.3.

The calibration totals used are population estimates based on the 2006 Census. They are official totals for the province, age and sex dimensions and simulation-based estimates for the other dimensions. Some missing data were imputed so that the variables used for calibration would be complete for all respondents.

The sample size and response rate for each province and territory are presented in Table A.4.

As required by the international consortium, two non-response bias analyses were carried out: a “basic” analysis, to assess the relationship between response status and available auxiliary variables correlated with the skill measures, and an “extended” analysis, to measure the effect of the various weight adjustments and assess the impact of non-response bias on key statistics (or correlated variables). These analyses showed that the various weight adjustments and the use of variables known to be correlated with the skill measures in the calibration stage minimized the effects that non-response had on the survey results.

Table A.3
Calibration variables by province and territory

Province/Territory	Calibration Variables
Newfoundland and Labrador	Age group and sex, highest level of schooling, CMA in which the dwelling is located
Prince Edward Island	Age group and sex, highest level of schooling
Nova Scotia	Age group and sex, highest level of schooling, CMA in which the dwelling is located
New Brunswick	Age group and sex, highest level of schooling, membership in a linguistic minority
Quebec	Age group and sex, highest level of schooling, immigrant status, Aboriginal (all combined), CMA in which the dwelling is located, membership in a linguistic minority
Ontario	Age group and sex, highest level of schooling, immigrant status, Aboriginal, CMA in which the dwelling is located, membership in a linguistic minority
Manitoba	Age group and sex, highest level of schooling, Aboriginal (all combined), CMA in which the dwelling is located, membership in a linguistic minority
Saskatchewan	Age group and sex, highest level of schooling, Aboriginal (all combined), CMA in which the dwelling is located
Alberta	Age group and sex, highest level of schooling, immigrant status, Aboriginal (all combined), CMA in which the dwelling is located
British Columbia	Age group and sex, highest level of schooling, immigrant status, Aboriginal (all combined), CMA in which the dwelling is located
Yukon	Age group and sex, highest level of schooling, Aboriginal (all combined)
Northwest Territories	Age group and sex, highest level of schooling, Aboriginal (all combined)
Nunavut	Age group and sex, highest level of schooling, Aboriginal (Inuit)

Notes: The age groups are 16 to 24, 25 to 34, 35 to 44, 45 to 54, and 55 to 65; the youth age group is defined as the 16-to-24 age group in British Columbia. Highest level of schooling can take four values: less than high school diploma, high school diploma, post-secondary education - below bachelor's degree, and post-secondary education - bachelor's degree or higher.

Table A.4
Actual sample size and response rate by province and territory

Region	Population aged 16 to 65	Initial sample number	Out-of-scope cases ¹	Respondents ²	Response rate ³
					percent
Canada	23,381,067	49,450	6,335	27,285	58.5
Newfoundland and Labrador	349,233	2,591	192	1,609	63.9
Prince Edward Island	97,542	1,656	135	929	59.5
Nova Scotia	627,538	2,361	129	1,441	60.4
New Brunswick	500,997	2,758	236	1,686	63.0
Quebec	5,404,254	9,699	842	5,911	62.5
Ontario	9,148,632	10,371	1,874	5,313	55.8
Manitoba	785,291	4,360	592	2,312	56.8
Saskatchewan	657,025	3,031	440	1,601	57.9
Alberta	2,622,199	2,211	226	1,224	56.8
British Columbia	3,111,300	5,376	1,066	2,733	58.8
Yukon	25,564	1,750	279	830	50.7
Northwest Territories	30,506	1,760	189	917	56.6
Nunavut	20,987	1,526	135	779	52.3

1. Out-of-scope cases are those that were coded as residents not eligible, unable to locate the dwelling, dwelling under construction, vacant or seasonal, or duplicate cases.
2. A respondent's data is considered complete for the purposes of the scaling of psychometric assessment data as long as the Background Questionnaire was completed.
3. Since the PIAAC sample has been selected among the 2011 Census or the NHS responding households, their respective response rates have been taken into to calculate the PIAAC weighted response rate.

Source: Programme for the International Assessment for Adult Competencies, 2012.

Jackknife weights

A set of jackknife weights was generated to estimate the variance of the estimates produced with the survey data. The jackknife method with one unit removed (JK1) was selected because of its ease of implementation (Landry 2012). In the application of this method, each selected dwelling was assigned to a variance group. The sample PSUs were divided into 80 variance groups, or “replicates”, and each replicate's jackknife weight was calculated by assigning a weight of 0 to the replicate's dwellings and multiplying the weights of the other dwellings by 80/79.

The method used to allocate the variance groups differs depending on whether the stratum is take-all (strata A and C) or take-some (stratum B). For a take-all stratum, the dwelling serves as the PSU, and each dwelling was assigned to a replicate independently. Thus, the first dwelling was assigned to a replicate at random, the next dwelling to the next replicate, and so on for all the dwellings in the stratum. The set of 80 replicates was split between the take-all PSUs and the take-some PSUs on the basis of a measure of the size (size of the PIAAC's target population) of the take-all or take-some PSUs. For example, if the take-all PSUs made up 50% of the PIAAC's target population, then 40 (80 * 0.5) replicates were allocated to the take-all PSUs. The remaining 40 replicates were assigned to the take-some PSUs. This process was performed independently for each province/territory–subsample combination.

Then the number of replicates to be allocated to each take-all PSU was determined so that the number of variance units assigned to each take-all PSU reflected the ratio of the PSU's size to a particular limit (the boundary between the take-all PSUs and the take-some PSUs). If a take-all PSU's size was about six times the limit, it received 6+1 replicates (i.e., six degrees of freedom). After the number of replicates was determined for each take-all stratum, the dwellings were sorted on the basis of the order in which they

were sampled and the variance unit assigned to them. If the first take-all PSU in the sort received four replicates, its dwellings were assigned a variance unit of 1, 2, 3, 4, 1, 2, 3, 4, and so on. If the next PSU in the sort received two replicates, its dwellings were assigned a variance unit of 5, 6, 5, 6, and so on. The variance unit allocation for the take-all PSUs starts over when it reaches replicate n (in the example given above, replicate 40 would be followed by replicate 1).

The take-some PSUs were sorted into the order in which they were sampled. Then they were numbered sequentially from $n+1$ to 80 (in the above example, n would be 40) to form the variance units.

The presence of a second-phase sample among NHS respondents was also taken into account in the calculation of the jackknife weights by using the method described by Kim and Yu (2011).

The jackknife weights were produced from the PIAAC's entire initial sample, and the initial jackknife weights were calculated with the weights determined by the sampling plan. The entire weighting process was repeated for each of the 80 jackknife weights, including non-response weighting adjustments, combining of weights, and calibration.

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Annex B - Tables

Table B.1.1

Literacy — Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, countries, provinces and territories, 2012

Region	Average	Standard error	0.95 confidence interval	5 th percentile		25 th percentile		75 th percentile		95 th percentile	
				scores	standard error	scores	standard error	scores	standard error	scores	standard error
Countries											
OECD average	273.3	(0.2)	±0.3	191.1	(0.6)	245.1	(0.3)	305.5	(0.2)	342.5	(0.4)
Australia	280.4	(0.9)	±1.8	193.3	(3.1)	251.2	(1.3)	314.9	(1.2)	354.6	(1.7)
Austria	269.5	(0.7)	±1.4	194.1	(2.3)	242.0	(1.2)	300.0	(1.0)	336.1	(1.3)
Canada	273.5	(0.6)	±1.1	185.1	(1.9)	242.5	(1.1)	308.7	(0.8)	348.0	(1.2)
Cyprus	268.8	(0.8)	±1.5	198.3	(2.4)	243.6	(1.2)	296.1	(1.2)	330.6	(2.4)
Czech Republic	274.0	(1.0)	±1.9	202.7	(3.9)	248.6	(1.5)	302.0	(1.4)	335.8	(2.5)
Denmark	270.8	(0.6)	±1.2	186.0	(2.4)	243.8	(1.0)	303.4	(0.9)	338.9	(1.5)
England/N. Ireland (UK)	272.5	(1.0)	±2.0	188.1	(3.4)	241.2	(1.4)	307.1	(1.3)	346.6	(1.9)
Estonia	275.9	(0.7)	±1.4	198.6	(2.1)	248.4	(0.9)	306.0	(0.9)	344.2	(1.8)
Finland	287.5	(0.7)	±1.3	200.0	(3.2)	258.3	(1.2)	322.1	(1.0)	361.8	(1.5)
Flanders (Belgium)	275.5	(0.8)	±1.6	191.1	(2.6)	246.4	(1.2)	308.9	(1.0)	343.7	(1.6)
Germany	269.8	(0.9)	±1.8	186.5	(2.6)	238.7	(1.5)	303.8	(1.2)	341.5	(1.5)
Ireland	266.5	(0.9)	±1.8	181.7	(4.2)	239.2	(1.7)	298.3	(1.1)	337.0	(1.8)
Italy	250.5	(1.1)	±2.1	173.2	(3.2)	221.9	(1.6)	282.2	(1.6)	319.5	(1.8)
Japan	296.2	(0.7)	±1.3	226.4	(2.2)	272.3	(1.2)	323.6	(0.9)	355.3	(1.5)
Korea	272.6	(0.6)	±1.1	198.6	(1.8)	247.7	(0.8)	301.2	(0.9)	334.6	(1.9)
Netherlands	284.0	(0.7)	±1.4	195.7	(3.1)	255.6	(1.0)	317.2	(0.9)	354.6	(1.6)
Norway	278.4	(0.6)	±1.2	194.5	(3.0)	251.2	(1.3)	310.7	(0.8)	346.6	(1.7)
Poland	266.9	(0.6)	±1.2	182.5	(2.6)	236.8	(1.1)	299.9	(0.9)	340.3	(1.5)
Slovak Republic	273.8	(0.6)	±1.2	201.0	(2.5)	250.2	(1.1)	301.4	(0.8)	332.5	(1.5)
Spain	251.8	(0.7)	±1.4	163.5	(3.0)	221.7	(1.2)	286.1	(0.8)	325.1	(1.9)
Sweden	279.2	(0.7)	±1.3	188.4	(4.0)	251.3	(1.3)	313.4	(1.1)	351.3	(1.5)
United States	269.8	(1.0)	±2.1	182.0	(3.3)	238.3	(1.5)	304.6	(1.5)	344.4	(2.2)
Provinces and territories											
Newfoundland and Labrador	265.4	(1.4)	±2.7	185.2	(4.0)	232.8	(2.3)	300.1	(2.5)	339.2	(4.0)
Prince Edward Island	277.5	(3.6)	±7.0	192.5	(10.8)	249.5	(5.2)	310.0	(4.0)	347.9	(5.2)
Nova Scotia	273.9	(1.7)	±3.3	195.1	(3.7)	241.6	(2.2)	308.2	(2.6)	347.5	(3.3)
New Brunswick	268.3	(1.4)	±2.8	186.3	(5.3)	237.7	(2.6)	301.2	(2.4)	341.1	(4.6)
Quebec	268.6	(0.8)	±1.5	182.3	(2.7)	237.4	(1.2)	303.1	(1.5)	343.9	(1.8)
Ontario	275.5	(1.0)	±1.9	186.6	(5.0)	245.6	(1.7)	310.5	(1.6)	350.1	(2.3)
Manitoba	273.9	(2.0)	±3.9	183.1	(9.9)	244.8	(3.2)	310.0	(2.3)	346.0	(4.0)
Saskatchewan	271.6	(2.3)	±4.4	186.9	(5.3)	240.6	(3.9)	304.9	(2.9)	343.9	(4.3)
Alberta	277.7	(1.9)	±3.6	191.3	(6.9)	245.1	(3.4)	312.4	(2.5)	351.4	(5.0)
British Columbia	274.8	(1.8)	±3.5	181.6	(6.7)	243.0	(4.2)	311.8	(2.7)	348.3	(4.2)
Yukon	277.2	(11.2)	±22.0	184.3	(21.7)	244.6	(15.1)	312.3	(10.6)	355.5	(22.2)
Northwest Territories	253.3	(5.9)	±11.6	157.8	(10.2)	214.5	(8.9)	294.2	(5.6)	343.1	(5.4)
Nunavut	219.1	(3.8)	±7.5	128.8	(7.8)	177.2	(5.2)	258.7	(5.0)	316.2	(4.8)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.1.2

Literacy — Comparative distributions of proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012

Region	Below level 1		Level 1		Level 2		Level 3		Level 4 or 5	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Countries										
OECD average	3.3	(0.1)	12.1	(0.1)	33.6	(0.2)	38.9	(0.2)	12.1	(0.1)
Australia	3.2	(0.3)	9.6	(0.6)	29.7	(0.7)	40.1	(0.9)	17.3	(0.8)
Austria	2.5	(0.3)	13.1	(0.7)	37.9	(0.9)	38.0	(0.9)	8.6	(0.5)
Canada	3.8	(0.2)	12.7	(0.5)	32.0	(0.7)	37.6	(0.7)	13.9	(0.5)
Cyprus	1.9	(0.3)	12.5	(0.6)	40.1	(1.1)	39.0	(1.1)	6.5	(0.5)
Czech Republic	1.5	(0.3)	10.3	(0.7)	37.7	(1.6)	41.7	(1.4)	8.7	(0.8)
Denmark	3.8	(0.3)	11.9	(0.6)	34.1	(0.9)	40.1	(0.8)	10.0	(0.5)
England/N. Ireland (UK)	3.3	(0.4)	13.3	(0.7)	33.7	(1.0)	36.4	(1.0)	13.3	(0.7)
Estonia	2.0	(0.2)	11.0	(0.5)	34.4	(0.7)	40.8	(0.9)	11.8	(0.5)
Finland	2.7	(0.2)	8.0	(0.5)	26.5	(0.9)	40.7	(0.8)	22.2	(0.6)
Flanders (Belgium)	2.9	(0.3)	11.9	(0.6)	31.2	(0.8)	40.9	(1.0)	13.1	(0.6)
Germany	3.3	(0.4)	14.5	(0.7)	34.4	(1.0)	37.0	(1.0)	10.8	(0.6)
Ireland	4.3	(0.4)	13.2	(0.8)	37.7	(0.9)	36.2	(0.9)	8.5	(0.5)
Italy	5.6	(0.6)	22.3	(1.0)	42.3	(1.0)	26.5	(1.0)	3.3	(0.4)
Japan	0.6	(0.2)	4.4	(0.4)	23.1	(0.8)	49.2	(1.0)	22.8	(0.7)
Korea	2.2	(0.2)	10.7	(0.5)	37.1	(0.9)	41.8	(0.9)	8.1	(0.5)
Netherlands	2.6	(0.3)	9.3	(0.5)	27.0	(0.7)	42.4	(0.8)	18.6	(0.7)
Norway	3.1	(0.3)	9.5	(0.6)	30.9	(0.8)	42.6	(0.9)	14.0	(0.6)
Poland	3.9	(0.3)	14.8	(0.6)	36.5	(0.9)	35.0	(0.9)	9.7	(0.5)
Slovak Republic	1.9	(0.2)	9.8	(0.5)	36.3	(1.0)	44.5	(0.9)	7.5	(0.5)
Spain	7.3	(0.5)	20.4	(0.9)	39.4	(0.7)	28.0	(0.7)	4.8	(0.4)
Sweden	3.7	(0.3)	9.6	(0.6)	29.1	(1.0)	41.6	(0.9)	16.1	(0.6)
United States	4.1	(0.5)	14.2	(0.7)	34.0	(1.2)	35.7	(1.0)	12.0	(0.7)
Provinces and territories										
Newfoundland and Labrador	3.4	(0.5)	17.2	(1.3)	36.2	(1.8)	33.6	(1.5)	9.6	(1.0)
Prince Edward Island	3.0	(0.7)	10.6	(1.7)	31.7	(2.3)	40.8	(2.2)	13.9	(2.3)
Nova Scotia	2.3	(0.5)	13.6	(1.1)	34.4	(1.9)	36.0	(1.6)	13.7	(1.5)
New Brunswick	3.5	(0.7)	15.0	(1.4)	34.9	(1.5)	36.2	(1.4)	10.3	(1.0)
Quebec	4.1	(0.3)	14.9	(0.7)	34.3	(0.8)	35.5	(0.8)	11.3	(0.5)
Ontario	3.9	(0.4)	11.1	(0.9)	31.8	(1.4)	38.3	(1.3)	14.9	(0.9)
Manitoba	4.2	(0.9)	11.8	(1.3)	32.3	(2.2)	37.6	(2.1)	14.1	(1.7)
Saskatchewan	3.4	(0.7)	13.9	(1.4)	32.6	(2.1)	38.9	(1.9)	11.2	(1.5)
Alberta	2.8	(0.7)	12.4	(1.4)	29.6	(2.0)	39.3	(2.3)	15.8	(1.3)
British Columbia	4.4	(0.8)	12.4	(1.2)	29.1	(1.7)	38.7	(1.8)	15.4	(1.4)
Yukon	4.3	(3.0)	12.2	(4.9)	27.9	(6.0)	39.5	(7.6)	16.1	(5.7)
Northwest Territories	9.0	(2.4)	22.5	(2.9)	32.3	(2.5)	26.2	(2.5)	10.0	(2.0)
Nunavut	24.1	(3.0)	31.6	(2.4)	27.5	(1.9)	13.5	(1.8)	3.4	(0.8)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.1.3

Numeracy — Average scores with 0.95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles of population aged 16 to 65, countries, provinces and territories, 2012

Region	Average	Standard error	0.95 confidence interval	5 th percentile		25 th percentile		75 th percentile		95 th percentile	
				scores	standard error	scores	standard error	scores	standard error	scores	standard error
Countries											
OECD average	269.4	(0.2)	±0.4	179.7	(0.7)	238.8	(0.3)	304.3	(0.3)	346.1	(0.4)
Australia	267.6	(0.9)	±1.9	169.3	(4.6)	234.7	(1.4)	305.5	(1.4)	351.6	(2.1)
Austria	275.0	(0.9)	±1.7	189.9	(3.7)	245.7	(1.4)	308.6	(0.9)	349.2	(2.2)
Canada	265.5	(0.7)	±1.4	169.2	(2.5)	230.8	(1.1)	303.9	(0.8)	349.3	(1.2)
Cyprus	264.6	(0.8)	±1.5	182.6	(3.6)	236.5	(1.4)	296.4	(1.2)	335.2	(1.8)
Czech Republic	275.7	(0.9)	±1.8	200.7	(2.8)	248.1	(1.8)	305.2	(1.2)	343.1	(2.9)
Denmark	278.3	(0.7)	±1.4	189.7	(3.3)	247.5	(1.2)	313.3	(1.0)	355.0	(1.8)
England/N. Ireland (UK)	261.7	(1.1)	±2.1	167.5	(3.0)	227.0	(1.6)	300.1	(1.5)	345.4	(2.1)
Estonia	273.1	(0.5)	±1.0	195.1	(1.9)	245.1	(0.8)	303.9	(0.8)	343.7	(1.5)
Finland	282.2	(0.7)	±1.4	193.7	(3.1)	250.9	(1.4)	317.3	(0.9)	360.8	(2.2)
Flanders (Belgium)	280.4	(0.8)	±1.6	191.2	(2.9)	249.1	(1.6)	315.6	(1.0)	356.3	(2.1)
Germany	271.7	(1.0)	±2.0	179.1	(3.6)	238.4	(1.5)	309.3	(1.3)	350.6	(2.1)
Ireland	255.6	(1.0)	±2.0	160.7	(4.4)	225.4	(1.7)	291.1	(1.2)	335.9	(2.2)
Italy	247.1	(1.1)	±2.1	161.2	(3.5)	215.5	(1.6)	281.9	(1.6)	324.2	(2.0)
Japan	288.2	(0.7)	±1.5	212.7	(2.7)	260.8	(1.3)	318.1	(1.0)	355.4	(1.4)
Korea	263.4	(0.7)	±1.4	181.4	(2.3)	236.2	(1.0)	294.7	(1.1)	331.6	(1.3)
Netherlands	280.3	(0.7)	±1.4	188.7	(2.9)	251.0	(1.3)	315.4	(0.9)	354.2	(1.5)
Norway	278.3	(0.8)	±1.5	181.3	(3.0)	248.1	(1.4)	315.0	(1.0)	356.8	(2.2)
Poland	259.8	(0.8)	±1.6	171.0	(2.7)	228.6	(1.4)	294.4	(1.1)	338.2	(1.7)
Slovak Republic	275.8	(0.8)	±1.6	189.0	(3.5)	248.7	(1.4)	307.9	(1.1)	345.8	(1.7)
Spain	245.8	(0.6)	±1.2	149.1	(3.1)	216.3	(1.2)	280.9	(1.1)	322.4	(1.5)
Sweden	279.1	(0.8)	±1.6	181.9	(4.1)	249.2	(1.4)	316.0	(1.3)	358.4	(1.7)
United States	252.8	(1.2)	±2.3	151.8	(3.8)	217.1	(1.8)	293.1	(1.7)	340.1	(2.6)
Provinces and territories											
Newfoundland and Labrador	251.9	(1.6)	±3.1	159.5	(5.7)	215.3	(2.9)	291.0	(2.5)	340.5	(4.4)
Prince Edward Island	265.0	(4.2)	±8.2	168.8	(9.0)	232.0	(5.1)	301.2	(4.5)	346.6	(11.0)
Nova Scotia	262.8	(1.9)	±3.6	171.6	(5.3)	225.5	(3.8)	301.6	(2.6)	347.8	(5.4)
New Brunswick	255.7	(1.7)	±3.3	165.1	(5.8)	221.5	(3.0)	292.7	(2.6)	337.5	(3.1)
Quebec	264.9	(0.8)	±1.5	175.5	(3.4)	232.5	(1.5)	300.5	(1.1)	344.6	(1.9)
Ontario	266.3	(1.2)	±2.3	167.5	(4.5)	231.1	(2.1)	306.1	(2.3)	350.9	(2.9)
Manitoba	264.2	(2.6)	±5.0	162.6	(9.4)	231.1	(3.5)	303.0	(3.4)	346.2	(5.0)
Saskatchewan	262.8	(2.0)	±3.9	168.3	(7.5)	228.2	(3.8)	300.0	(3.0)	343.8	(6.3)
Alberta	269.1	(2.2)	±4.3	175.8	(7.5)	232.8	(4.1)	306.8	(2.4)	355.2	(6.0)
British Columbia	266.3	(1.9)	±3.6	163.5	(9.5)	231.7	(3.0)	306.1	(2.4)	351.1	(4.8)
Yukon	263.1	(9.1)	±17.9	162.9	(21.3)	225.0	(16.5)	303.3	(7.7)	349.7	(15.4)
Northwest Territories	239.4	(6.6)	±13.0	133.8	(12.8)	195.6	(9.2)	285.8	(5.8)	339.8	(7.0)
Nunavut	200.5	(4.1)	±8.0	104.9	(10.0)	155.6	(5.7)	242.9	(5.9)	309.9	(6.1)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.1.4

Numeracy — Comparative distributions of proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012

Region	Below level 1		Level 1		Level 2		Level 3		Level 4 or 5	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Countries										
OECD average	4.8	(0.1)	14.0	(0.1)	33.4	(0.2)	35.1	(0.2)	12.8	(0.1)
Australia	5.8	(0.4)	14.6	(0.7)	32.7	(0.9)	33.2	(0.9)	13.6	(0.7)
Austria	3.5	(0.3)	11.1	(0.6)	33.8	(0.9)	37.8	(1.0)	13.9	(0.6)
Canada	6.0	(0.3)	16.6	(0.5)	32.1	(0.5)	32.6	(0.7)	12.7	(0.4)
Cyprus	4.1	(0.4)	14.7	(0.8)	38.6	(1.1)	34.5	(1.0)	8.1	(0.5)
Czech Republic	1.7	(0.3)	11.2	(0.8)	34.9	(1.2)	40.6	(1.3)	11.5	(0.8)
Denmark	3.4	(0.3)	10.9	(0.5)	30.8	(0.8)	38.2	(0.7)	16.7	(0.5)
England/N. Ireland (UK)	6.4	(0.5)	18.0	(0.9)	33.9	(1.0)	30.2	(1.0)	11.4	(0.7)
Estonia	2.4	(0.2)	11.9	(0.5)	36.3	(0.6)	38.1	(0.6)	11.2	(0.4)
Finland	3.1	(0.3)	9.7	(0.5)	29.3	(0.7)	38.4	(0.8)	19.4	(0.6)
Flanders (Belgium)	3.1	(0.3)	11.0	(0.6)	29.2	(0.8)	38.8	(1.0)	17.9	(0.7)
Germany	4.6	(0.4)	14.1	(0.7)	31.4	(0.8)	35.4	(0.9)	14.5	(0.6)
Ireland	7.1	(0.5)	18.2	(0.8)	38.2	(0.9)	29.0	(0.9)	7.6	(0.6)
Italy	8.1	(0.6)	23.8	(1.0)	39.0	(1.1)	24.5	(1.0)	4.5	(0.4)
Japan	1.2	(0.2)	7.1	(0.5)	28.4	(0.8)	44.3	(0.8)	19.1	(0.7)
Korea	4.2	(0.3)	14.8	(0.6)	39.5	(1.0)	34.7	(0.9)	6.8	(0.6)
Netherlands	3.6	(0.3)	9.9	(0.6)	28.8	(0.8)	40.3	(0.9)	17.4	(0.7)
Norway	4.4	(0.3)	10.5	(0.5)	29.1	(0.8)	38.2	(0.8)	17.8	(0.6)
Poland	5.9	(0.4)	17.6	(0.6)	37.7	(0.9)	30.5	(0.9)	8.4	(0.5)
Slovak Republic	3.5	(0.3)	10.3	(0.6)	32.3	(0.9)	41.3	(1.0)	12.7	(0.7)
Spain	9.6	(0.5)	21.3	(0.7)	40.4	(0.9)	24.7	(0.7)	4.1	(0.3)
Sweden	4.4	(0.4)	10.3	(0.7)	28.7	(1.1)	38.0	(1.1)	18.6	(0.7)
United States	9.5	(0.6)	20.5	(0.8)	34.1	(1.0)	27.1	(0.9)	8.9	(0.6)
Provinces and territories										
Newfoundland and Labrador	8.6	(0.9)	23.3	(1.6)	33.6	(1.7)	25.8	(1.4)	8.7	(1.0)
Prince Edward Island	5.9	(1.1)	15.7	(2.1)	34.2	(2.4)	33.2	(2.4)	11.1	(1.9)
Nova Scotia	5.8	(0.9)	19.3	(1.3)	33.1	(1.7)	29.8	(1.6)	11.9	(1.1)
New Brunswick	7.2	(0.9)	20.6	(1.4)	35.3	(1.7)	28.9	(1.5)	8.0	(0.9)
Quebec	5.1	(0.4)	16.4	(0.6)	34.7	(0.9)	33.0	(0.8)	10.9	(0.6)
Ontario	6.1	(0.5)	16.4	(0.9)	31.4	(1.1)	32.7	(1.3)	13.5	(0.9)
Manitoba	6.8	(1.2)	15.3	(1.5)	32.6	(2.0)	33.7	(2.5)	11.6	(1.7)
Saskatchewan	6.3	(0.9)	17.5	(1.6)	32.7	(2.2)	33.0	(2.4)	10.5	(1.4)
Alberta	5.1	(0.9)	16.7	(1.5)	30.9	(2.0)	32.3	(2.1)	15.0	(1.2)
British Columbia	6.9	(0.9)	15.3	(1.2)	30.1	(1.9)	34.1	(1.9)	13.6	(1.4)
Yukon	7.6	(3.9)	17.2	(4.8)	31.0	(6.3)	31.6	(7.5)	12.6	(3.8)
Northwest Territories	17.1	(3.5)	24.0	(2.3)	28.7	(2.9)	22.1	(2.2)	8.2	(1.6)
Nunavut	37.6	(3.3)	29.0	(2.2)	20.7	(2.1)	10.1	(1.7)	2.6	(0.6)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.1.5

Proportion of population aged 16 to 65 by the mode of test administration, countries, provinces and territories, 2012

Region	Non-respondents		No computer experience		Failed ICT core		Opted out of the CBA		Took CBA	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Countries										
OECD average	1.4	(0.0)	9.2	(0.1)	4.9	(0.1)	10.2	(0.1)	74.3	(0.1)
Australia	2.7	(0.3)	4.0	(0.3)	3.5	(0.3)	13.7	(0.6)	76.0	(0.7)
Austria	1.8	(0.2)	9.6	(0.4)	4.0	(0.3)	11.3	(0.5)	73.2	(0.6)
Canada	1.9	(0.1)	4.5	(0.2)	5.9	(0.2)	6.3	(0.3)	81.4	(0.4)
Cyprus	17.7	(0.4)	18.4	(0.4)	1.9	(0.2)	18.0	(0.5)	44.1	(0.5)
Czech Republic	0.6	(0.2)	10.3	(0.5)	2.2	(0.3)	12.1	(0.8)	74.8	(0.9)
Denmark	0.4	(0.1)	2.4	(0.2)	5.3	(0.2)	6.4	(0.3)	85.5	(0.3)
England/N. Ireland (UK)	1.6	(0.2)	4.3	(0.3)	5.8	(0.3)	4.5	(0.4)	83.8	(0.6)
Estonia	0.5	(0.1)	9.9	(0.3)	3.4	(0.2)	15.8	(0.4)	70.4	(0.4)
Finland	0.1	(0.1)	3.5	(0.3)	5.2	(0.3)	9.7	(0.4)	81.4	(0.5)
Flanders (Belgium)	5.2	(0.2)	7.4	(0.3)	3.5	(0.3)	4.7	(0.3)	79.2	(0.5)
Germany	1.5	(0.2)	7.9	(0.5)	3.7	(0.4)	6.1	(0.5)	80.8	(0.7)
Ireland	0.6	(0.1)	10.1	(0.4)	4.7	(0.4)	17.4	(0.7)	67.3	(0.7)
Italy	0.7	(0.2)	24.4	(0.8)	2.5	(0.3)	14.6	(0.9)	57.7	(1.1)
Japan	1.3	(0.1)	10.2	(0.5)	10.7	(0.7)	15.9	(0.9)	61.9	(1.0)
Korea	0.3	(0.1)	15.5	(0.4)	9.1	(0.4)	5.4	(0.3)	69.8	(0.6)
Netherlands	2.3	(0.2)	3.0	(0.2)	3.7	(0.3)	4.5	(0.3)	86.6	(0.4)
Norway	2.2	(0.2)	1.6	(0.2)	5.2	(0.3)	6.7	(0.4)	84.2	(0.5)
Poland	0.0	(0.0)	19.5	(0.5)	6.5	(0.4)	23.8	(0.7)	50.2	(0.6)
Slovak Republic	0.3	(0.1)	22.0	(0.7)	2.2	(0.2)	12.2	(0.4)	63.3	(0.7)
Spain	0.8	(0.1)	17.0	(0.5)	6.2	(0.3)	10.7	(0.5)	65.4	(0.6)
Sweden	0.1	(0.0)	1.6	(0.2)	4.8	(0.3)	5.7	(0.3)	87.9	(0.5)
United States	4.3	(0.6)	5.2	(0.4)	4.1	(0.4)	6.3	(0.6)	80.0	(0.8)
Provinces and territories										
Newfoundland and Labrador	1.0	(0.2)	9.1	(0.9)	6.1	(0.7)	11.8	(1.1)	72.0	(1.2)
Prince Edward Island	1.0	(0.4)	5.6	(0.8)	5.3	(0.7)	9.0	(1.0)	79.1	(1.4)
Nova Scotia	1.5	(0.3)	4.2	(0.5)	5.5	(0.6)	5.2	(0.8)	83.7	(1.3)
New Brunswick	1.6	(0.4)	6.9	(0.5)	5.5	(0.7)	9.3	(0.9)	76.7	(1.2)
Quebec	1.5	(0.2)	5.7	(0.3)	5.2	(0.3)	5.5	(0.3)	82.1	(0.5)
Ontario	2.1	(0.3)	4.3	(0.3)	5.3	(0.4)	6.5	(0.5)	81.8	(0.8)
Manitoba	3.0	(0.5)	4.8	(0.8)	5.7	(0.9)	11.6	(1.3)	74.8	(1.5)
Saskatchewan	1.6	(0.3)	4.3	(0.6)	5.8	(0.7)	2.9	(0.6)	85.5	(1.1)
Alberta	2.5	(0.6)	2.0	(0.5)	7.5	(0.9)	4.8	(0.8)	83.2	(1.6)
British Columbia	1.8	(0.4)	3.9	(0.6)	7.8	(0.9)	6.7	(1.1)	79.8	(1.4)
Yukon	3.3	(2.5)	8.4	(4.1)	2.3	(0.7)	4.0	(1.5)	82.1	(6.1)
Northwest Territories	0.7	(0.3)	6.5	(0.9)	10.2	(1.4)	7.0	(1.3)	75.6	(1.8)
Nunavut	3.2	(0.8)	15.7	(1.5)	7.9	(1.1)	24.5	(2.6)	48.7	(2.8)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.1.6

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, countries, provinces and territories, 2012

Region	Levels 2 and 3 combined			PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	0.95 confidence interval	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Countries													
OECD average	34.0	(0.8)	±1.6	24.3	(0.1)	12.3	(0.1)	29.4	(0.2)	28.2	(0.2)	5.8	(0.1)
Australia	38.0	(1.0)	±2.0	24.0	(0.7)	9.2	(0.6)	28.9	(0.8)	31.8	(1.0)	6.2	(0.5)
Austria	32.5	(0.8)	±1.5	26.8	(0.6)	9.9	(0.5)	30.9	(0.9)	28.1	(0.8)	4.3	(0.4)
Canada	36.6	(0.6)	±1.1	18.6	(0.4)	14.8	(0.4)	30.0	(0.7)	29.4	(0.5)	7.1	(0.4)
Czech Republic	33.1	(1.1)	±2.2	25.2	(0.9)	12.9	(0.9)	28.8	(1.3)	26.5	(1.1)	6.6	(0.6)
Denmark	38.7	(0.7)	±1.4	14.5	(0.3)	13.9	(0.6)	32.9	(0.8)	32.3	(0.7)	6.3	(0.4)
England/N. Ireland (UK)	34.8	(0.9)	±1.7	16.2	(0.6)	15.1	(0.8)	33.9	(1.0)	29.1	(0.9)	5.6	(0.5)
Estonia	27.6	(0.7)	±1.5	29.6	(0.4)	13.8	(0.5)	29.0	(0.7)	23.2	(0.6)	4.3	(0.4)
Finland	41.6	(0.7)	±1.5	18.6	(0.5)	11.0	(0.5)	28.9	(0.8)	33.2	(0.7)	8.4	(0.6)
Flanders (Belgium)	34.5	(0.8)	±1.5	20.8	(0.5)	14.8	(0.6)	29.8	(0.8)	28.7	(0.8)	5.8	(0.4)
Germany	36.0	(0.8)	±1.6	19.2	(0.7)	14.4	(0.8)	30.5	(0.8)	29.2	(0.8)	6.8	(0.6)
Ireland	25.3	(0.8)	±1.6	32.7	(0.7)	12.6	(0.7)	29.5	(0.9)	22.1	(0.8)	3.1	(0.3)
Japan	34.6	(0.8)	±1.6	38.1	(1.0)	7.6	(0.6)	19.7	(0.8)	26.3	(0.8)	8.3	(0.5)
Korea	30.4	(0.8)	±1.6	30.2	(0.6)	9.8	(0.5)	29.6	(0.9)	26.8	(0.8)	3.6	(0.3)
Netherlands	41.5	(0.8)	±1.5	13.4	(0.4)	12.5	(0.6)	32.6	(0.7)	34.3	(0.8)	7.3	(0.4)
Norway	41.0	(0.8)	±1.5	15.8	(0.5)	11.4	(0.6)	31.8	(0.8)	34.9	(0.9)	6.1	(0.4)
Poland	19.2	(0.8)	±1.5	49.8	(0.6)	12.0	(0.6)	19.0	(0.7)	15.4	(0.7)	3.8	(0.3)
Slovak Republic	25.6	(0.8)	±1.5	36.7	(0.7)	8.9	(0.5)	28.8	(0.9)	22.8	(0.7)	2.9	(0.3)
Sweden	44.0	(0.7)	±1.4	12.1	(0.5)	13.1	(0.5)	30.8	(0.8)	35.2	(0.9)	8.8	(0.6)
United States	31.1	(1.0)	±2.0	20.0	(0.8)	15.8	(0.9)	33.1	(0.9)	26.0	(0.9)	5.1	(0.4)
Provinces and territories													
Newfoundland and Labrador	28.6	(1.3)	±2.5	28.0	(1.2)	16.4	(1.2)	27.0	(1.4)	24.2	(1.4)	4.4	(1.0)
Prince Edward Island	31.2	(2.5)	±4.9	20.9	(1.4)	14.9	(2.2)	32.9	(1.9)	26.9	(2.0)	4.3	(1.1)
Nova Scotia	38.9	(1.3)	±2.5	16.3	(1.3)	15.3	(1.4)	29.5	(1.4)	31.0	(1.4)	7.9	(1.1)
New Brunswick	30.3	(1.9)	±3.6	23.3	(1.2)	15.0	(1.3)	31.4	(1.7)	25.6	(1.7)	4.7	(1.0)
Quebec	32.4	(0.7)	±1.4	17.9	(0.5)	18.2	(0.6)	31.4	(0.8)	26.5	(0.7)	5.9	(0.4)
Ontario	38.4	(1.2)	±2.3	18.2	(0.8)	13.3	(0.8)	30.2	(1.3)	30.8	(1.1)	7.6	(0.8)
Manitoba	34.5	(2.2)	±4.3	25.2	(1.5)	12.5	(1.2)	27.8	(1.9)	28.6	(1.6)	6.0	(1.4)
Saskatchewan	32.6	(2.0)	±3.9	14.5	(1.1)	18.1	(1.6)	34.8	(2.0)	27.9	(1.8)	4.7	(0.9)
Alberta	39.5	(1.9)	±3.8	16.8	(1.6)	14.4	(1.5)	29.3	(2.0)	30.8	(2.0)	8.6	(1.4)
British Columbia	39.3	(1.7)	±3.4	20.2	(1.4)	12.9	(1.5)	27.7	(1.6)	31.2	(1.9)	8.1	(1.2)
Yukon	35.4	(8.4)	±16.4	17.9	(6.1)	13.1	(4.8)	33.6	(6.8)	27.3	(6.1)	8.1	(5.1)
Northwest Territories	28.2	(3.4)	±6.6	24.4	(1.8)	18.9	(4.6)	28.4	(2.8)	23.1	(2.7)	5.1	(1.7)
Nunavut	10.9	(1.5)	±3.0	51.3	(2.8)	19.6	(2.3)	18.2	(2.2)	9.8	(1.5)	1.2	(0.4)

Note: Cyprus, Italy, and Spain did not participate in PS-TRE.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.1

Literacy and numeracy — Average skills of population aged 16 to 65, by age group, Canada, 2012

Skill and age group	Average	Standard error
Literacy		
16 to 65	273.5	(0.6)
16 to 24	275.7	(1.3)
25 to 34	285.1	(1.3)
35 to 44	279.7	(1.4)
45 to 54	268.0	(1.3)
55 to 65	260.4	(1.1)
Numeracy		
16 to 65	265.5	(0.7)
16 to 24	268.3	(1.6)
25 to 34	276.5	(1.4)
35 to 44	271.9	(1.5)
45 to 54	260.7	(1.4)
55 to 65	251.4	(1.4)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.2

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by age group, Canada, 2012

Age group	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
16 to 24	6.8	(0.7)	9.1	(0.8)	32.5	(1.9)	41.5	(1.7)	10.1	(1.0)
25 to 34	8.2	(0.7)	12.3	(1.1)	29.6	(1.7)	38.4	(1.8)	11.5	(1.2)
35 to 44	13.5	(0.7)	13.1	(0.9)	30.4	(1.3)	34.0	(1.2)	8.9	(0.8)
45 to 54	21.6	(0.9)	18.3	(1.0)	31.3	(1.2)	24.0	(1.1)	4.8	(0.7)
55 to 65	32.5	(0.9)	21.2	(1.0)	29.5	(1.0)	14.9	(1.0)	1.9	(0.4)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.3

Literacy and numeracy — Average skills of population aged 16 to 65, by gender and age group, Canada, 2012

Skill and age group	Male		Female	
	average	standard error	average	standard error
Literacy				
16 to 65	274.6	(0.9)	272.3	(0.8)
16 to 24	275.1	(1.7)	276.4	(1.7)
25 to 34	285.4	(1.9)	284.8	(1.8)
35 to 44	280.0	(1.8)	279.3	(1.8)
45 to 54	269.9	(1.8)	266.0	(1.8)
55 to 65	263.6	(1.6)	257.3	(1.6)
Numeracy				
16 to 65	272.7	(0.9)	258.2	(1.0)
16 to 24	272.7	(2.1)	263.7	(2.0)
25 to 34	283.1	(2.1)	269.9	(1.9)
35 to 44	279.1	(2.0)	264.7	(1.9)
45 to 54	268.3	(1.8)	253.0	(2.0)
55 to 65	261.3	(1.8)	241.8	(2.0)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.4

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by gender and age group, Canada, 2012

Gender and age group	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Male										
16 to 65	17.3	(0.6)	15.0	(0.6)	29.8	(0.9)	30.0	(0.8)	7.9	(0.6)
16 to 24	7.8	(1.1)	9.8	(1.0)	31.8	(2.4)	40.5	(1.9)	10.2	(1.5)
25 to 34	8.7	(1.1)	12.5	(1.5)	28.9	(2.1)	37.6	(2.2)	12.2	(1.8)
35 to 44	13.3	(1.0)	13.9	(1.4)	30.0	(1.9)	32.7	(1.9)	10.1	(1.1)
45 to 54	22.9	(1.4)	17.1	(1.4)	30.0	(1.7)	24.6	(1.6)	5.3	(1.0)
55 to 65	31.6	(1.3)	20.8	(1.3)	28.4	(1.3)	16.8	(1.4)	2.4	(0.7)
Female										
16 to 65	16.8	(0.5)	15.2	(0.6)	31.5	(0.8)	30.0	(0.7)	6.6	(0.5)
16 to 24	5.7	(0.7)	8.5	(1.2)	33.4	(2.3)	42.5	(2.4)	10.0	(1.4)
25 to 34	7.7	(1.0)	12.1	(1.3)	30.3	(2.3)	39.1	(2.6)	10.8	(1.5)
35 to 44	13.8	(1.2)	12.3	(1.1)	30.9	(1.6)	35.3	(1.9)	7.8	(1.2)
45 to 54	20.3	(1.3)	19.4	(1.3)	32.6	(1.6)	23.5	(1.7)	4.2	(1.0)
55 to 65	33.5	(1.3)	21.6	(1.5)	30.5	(1.5)	13.1	(1.4)	1.3	(0.4)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.5

Literacy and numeracy — Averages and proficiency levels of population aged 16 to 65, by highest level of completed education, Canada, 2012

Skill and highest level of completed education	Average	Standard error	Below level 1		Level 1		Level 2		Level 3		Level 4 or 5	
			percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Literacy												
Less than high school	233.6	(1.6)	14.0	(1.1)	27.5	(1.7)	36.6	(2.3)	19.7	(1.3)	2.3	(0.7)
High school diploma	267.0	(1.2)	3.7	(0.5)	13.8	(1.0)	37.5	(1.2)	36.5	(1.1)	8.5	(0.7)
Postsecondary education - below bachelor's degree	275.8	(0.9)	1.9	(0.3)	11.1	(0.6)	34.2	(1.0)	41.2	(1.3)	11.6	(0.9)
Postsecondary education - bachelor's degree or higher	299.7	(1.0)	0.8	(0.2)	5.2	(0.5)	21.0	(0.9)	44.2	(1.2)	28.8	(1.2)
Numeracy												
Less than high school	222.2	(2.0)	19.9	(1.4)	30.8	(1.5)	31.4	(1.9)	15.4	(1.4)	2.5	(0.5)
High school diploma	256.6	(1.4)	6.3	(0.7)	19.7	(1.1)	37.0	(1.2)	29.5	(1.3)	7.5	(0.8)
Postsecondary education - below bachelor's degree	268.5	(1.1)	3.2	(0.4)	15.4	(0.8)	35.5	(1.1)	35.5	(1.0)	10.5	(0.7)
Postsecondary education - bachelor's degree or higher	295.1	(1.0)	1.4	(0.3)	6.9	(0.6)	23.4	(1.1)	41.8	(1.6)	26.5	(1.2)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.6

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by highest level of completed education, Canada, 2012

Highest level of completed education	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Less than high school	34.2	(1.2)	22.4	(1.1)	24.3	(1.7)	16.4	(1.4)	2.7	(0.7)
High school diploma	19.5	(0.8)	15.4	(1.0)	31.7	(1.2)	27.8	(1.0)	5.5	(0.7)
Postsecondary education - below bachelor's degree	14.1	(0.7)	15.8	(0.7)	34.2	(1.1)	29.6	(1.1)	6.3	(0.6)
Postsecondary education - bachelor's degree or higher	8.6	(0.6)	9.5	(0.7)	28.5	(1.1)	40.4	(1.2)	12.9	(1.0)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.7

Literacy and numeracy — Average scores and scores at 5th, 25th, 75th, and 95th percentiles across education levels of population aged 16 to 65, by age group, Canada, 2012

Skill, education level and age group	5 th percentile		25 th percentile		Average	Standard error	75 th percentile		95 th percentile	
	scores	standard error	scores	standard error			scores	standard error	scores	standard error
Literacy										
Less than high School										
16 to 24	180.7	(7.6)	232.0	(5.0)	259.5	(2.5)	290.5	(3.4)	326.0	(6.1)
25 to 34	147.4	(13.1)	199.3	(11.1)	229.5	(5.1)	261.1	(8.3)	303.9	(10.5)
35 to 44	129.9	(14.3)	190.5	(7.5)	222.1	(4.2)	259.8	(7.0)	304.8	(17.5)
45 to 54	115.8	(16.0)	175.6	(7.0)	210.8	(3.8)	247.5	(5.2)	289.0	(8.5)
55 to 65	127.0	(8.4)	189.0	(4.5)	219.1	(2.5)	254.4	(3.0)	294.1	(6.9)
High school diploma										
16 to 24	202.6	(9.3)	253.0	(3.4)	278.9	(2.1)	308.6	(3.0)	344.8	(4.6)
25 to 34	195.1	(8.4)	243.5	(4.9)	271.3	(2.6)	301.7	(4.3)	344.0	(10.1)
35 to 44	166.2	(15.3)	232.6	(7.3)	262.5	(3.3)	298.7	(4.8)	334.6	(5.6)
45 to 54	177.4	(9.8)	230.5	(3.7)	258.0	(2.5)	290.2	(3.8)	324.3	(5.9)
55 to 65	181.4	(9.4)	230.2	(3.3)	256.6	(2.3)	286.7	(3.8)	321.4	(4.6)
Postsecondary education - below bachelor's degree										
16 to 24	215.1	(10.1)	263.1	(3.6)	286.2	(2.6)	312.8	(3.5)	347.4	(6.1)
25 to 34	210.6	(6.2)	257.6	(3.8)	284.2	(2.1)	313.9	(3.6)	345.9	(4.4)
35 to 44	204.4	(4.9)	252.9	(3.0)	279.0	(1.9)	308.6	(2.6)	341.9	(4.1)
45 to 54	194.1	(6.7)	244.0	(2.9)	273.3	(1.8)	304.4	(2.7)	343.5	(5.0)
55 to 65	188.2	(6.3)	235.0	(3.2)	262.7	(1.9)	292.6	(2.6)	329.0	(4.2)
Postsecondary education - bachelor's degree or higher										
16 to 24	215.8	(21.9)	280.2	(11.3)	304.1	(4.6)	332.3	(9.3)	368.5	(14.9)
25 to 34	230.5	(5.1)	280.2	(3.5)	306.3	(1.9)	336.0	(3.2)	371.3	(6.2)
35 to 44	221.0	(6.0)	276.1	(3.7)	301.1	(1.9)	330.6	(2.7)	366.3	(3.9)
45 to 54	216.9	(8.2)	265.9	(3.8)	295.1	(2.2)	327.8	(3.5)	362.5	(5.0)
55 to 65	217.4	(6.4)	265.9	(5.2)	292.6	(2.3)	322.5	(3.1)	355.6	(3.8)
Numeracy										
Less than high School										
16 to 24	163.3	(8.4)	218.6	(4.4)	250.8	(2.6)	286.2	(3.8)	327.2	(5.8)
25 to 34	131.3	(14.0)	185.6	(8.3)	218.5	(5.5)	252.5	(8.4)	301.1	(16.1)
35 to 44	112.7	(17.1)	176.7	(9.1)	211.5	(4.6)	248.9	(10.3)	306.7	(16.6)
45 to 54	90.9	(10.9)	165.6	(7.8)	198.7	(4.3)	238.3	(6.0)	284.5	(7.9)
55 to 65	106.4	(10.0)	169.6	(6.1)	203.9	(3.0)	240.9	(4.2)	284.9	(8.8)
High school diploma										
16 to 24	185.9	(9.5)	241.6	(4.3)	270.9	(2.5)	303.8	(2.9)	347.6	(4.8)
25 to 34	180.3	(8.3)	227.2	(4.4)	260.7	(2.9)	294.4	(5.2)	339.4	(9.0)
35 to 44	145.0	(20.2)	218.1	(6.2)	251.0	(3.6)	289.5	(7.3)	331.5	(7.6)
45 to 54	155.7	(11.0)	215.7	(4.1)	246.6	(2.7)	282.9	(4.2)	318.4	(5.0)
55 to 65	161.7	(14.4)	215.2	(3.6)	244.5	(2.6)	277.0	(3.7)	319.6	(7.4)
Postsecondary education - below bachelor's degree										
16 to 24	201.5	(13.2)	251.7	(6.7)	280.6	(3.1)	312.9	(3.5)	347.9	(6.5)
25 to 34	197.0	(5.2)	246.1	(4.8)	275.6	(2.4)	307.5	(3.7)	343.1	(6.1)
35 to 44	188.5	(5.9)	240.5	(3.3)	270.4	(2.0)	303.0	(2.9)	343.8	(5.1)
45 to 54	183.1	(5.8)	236.1	(3.5)	267.3	(2.1)	300.4	(2.7)	344.1	(6.1)
55 to 65	178.3	(9.8)	225.7	(2.8)	255.5	(2.1)	287.1	(3.0)	329.5	(6.5)
Postsecondary education - bachelor's degree or higher										
16 to 24	217.1	(12.1)	269.5	(12.0)	301.9	(5.7)	337.0	(9.7)	382.5	(27.5)
25 to 34	213.8	(6.9)	270.4	(3.6)	299.3	(2.1)	332.4	(4.0)	371.2	(5.2)
35 to 44	213.2	(7.5)	269.7	(3.4)	296.7	(1.9)	328.4	(4.1)	368.5	(5.9)
45 to 54	205.3	(6.8)	259.5	(3.6)	291.4	(2.3)	326.0	(3.3)	364.7	(3.7)
55 to 65	208.1	(9.6)	260.1	(4.7)	289.1	(2.5)	321.1	(3.3)	361.1	(6.0)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.8

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by highest level of completed education and age group, Canada, 2012

Highest level of completed education and age group	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Less than high school										
16 to 24	6.7	(1.0)	13.1	(1.8)	36.0	(3.3)	37.3	(2.9)	6.9	(1.9)
25 to 34	19.4	(3.2)	41.6	(4.7)	27.6	(4.8)	x	x	x	x
35 to 44	37.8	(3.6)	30.2	(4.3)	23.8	(4.2)	x	x	x	x
45 to 54	55.6	(2.8)	26.7	(2.7)	14.5	(2.4)	3.0	(1.4)	0.0	(0.0)
55 to 65	63.3	(2.0)	21.6	(2.2)	13.3	(1.9)	1.7	(0.9)	0.0	(0.0)
High school diploma										
16 to 24	7.9	(1.2)	7.7	(1.2)	31.8	(2.2)	42.4	(2.3)	10.2	(1.5)
25 to 34	11.4	(1.8)	15.2	(2.6)	33.8	(3.5)	32.3	(3.7)	7.4	(2.4)
35 to 44	20.9	(2.0)	15.4	(2.5)	31.6	(3.0)	27.6	(3.0)	4.6	(1.4)
45 to 54	26.1	(2.0)	19.6	(2.4)	33.8	(3.0)	18.7	(2.3)	1.9	(0.9)
55 to 65	37.2	(2.2)	23.5	(2.2)	28.2	(2.5)	10.3	(1.7)	0.8	(0.5)
Postsecondary education - below bachelor's degree										
16 to 24	5.3	(1.6)	7.0	(1.9)	33.1	(4.4)	43.6	(3.6)	11.0	(2.3)
25 to 34	6.0	(0.9)	11.1	(1.6)	32.8	(2.5)	40.1	(3.2)	10.0	(1.9)
35 to 44	11.8	(1.2)	12.3	(1.4)	35.4	(2.4)	33.8	(2.3)	6.7	(1.2)
45 to 54	16.4	(1.5)	18.6	(1.3)	34.3	(1.8)	25.6	(1.7)	5.0	(1.2)
55 to 65	25.6	(1.6)	24.5	(1.9)	34.6	(1.9)	13.8	(1.4)	1.4	(0.6)
Postsecondary education - bachelor's degree or higher										
16 to 24	3.4	(1.6)	5.3	(2.6)	19.0	(4.0)	49.7	(6.2)	22.5	(5.5)
25 to 34	6.2	(1.0)	5.6	(1.0)	24.3	(2.2)	46.3	(2.7)	17.6	(2.0)
35 to 44	6.7	(1.0)	9.3	(1.2)	26.1	(1.8)	42.7	(2.1)	15.2	(1.7)
45 to 54	10.0	(1.1)	12.6	(1.6)	32.4	(2.4)	36.0	(2.5)	9.0	(1.4)
55 to 65	14.6	(1.8)	13.2	(1.9)	35.6	(2.7)	31.5	(2.9)	5.1	(1.6)

x Suppressed to meet the confidentiality requirements of the *Statistics Act*.

0 True zero or a value rounded to zero.

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.9

Literacy and numeracy — Averages and proficiency levels of population aged 16 to 65, by labour force status, Canada, 2012

Skill and labour force status	Average	Standard error	Below level 1		Level 1		Level 2		Level 3		Level 4 or 5	
			percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Literacy												
Total	273.5	(0.6)	3.8	(0.2)	12.7	(0.5)	32.0	(0.7)	37.6	(0.7)	13.9	(0.5)
Employed	278.3	(0.6)	2.7	(0.2)	11.2	(0.4)	31.0	(0.7)	39.6	(0.8)	15.5	(0.6)
Unemployed	265.1	(2.8)	4.5	(1.2)	15.2	(2.2)	36.6	(2.9)	34.1	(3.1)	9.5	(1.8)
Not in labour force	256.7	(1.5)	8.2	(0.8)	18.0	(1.1)	34.6	(1.5)	30.8	(1.2)	8.5	(0.8)
Numeracy												
Total	265.5	(0.7)	6.0	(0.3)	16.6	(0.5)	32.1	(0.5)	32.6	(0.7)	12.7	(0.4)
Employed	271.8	(0.7)	4.0	(0.3)	14.7	(0.5)	32.0	(0.6)	34.9	(0.8)	14.4	(0.5)
Unemployed	249.4	(2.9)	9.4	(1.8)	22.5	(2.9)	34.3	(2.9)	27.3	(3.3)	6.5	(1.7)
Not in labour force	244.8	(1.5)	12.6	(0.9)	22.6	(1.0)	32.3	(1.3)	25.3	(1.1)	7.2	(0.7)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.10

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by labour force status, Canada, 2012

Labour force status	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Employed	13.9	(0.4)	14.5	(0.5)	31.5	(0.7)	32.2	(0.6)	7.9	(0.5)
Unemployed	17.3	(2.1)	13.7	(1.9)	32.0	(2.7)	30.2	(2.7)	6.8	(1.9)
Not in labour force	28.9	(0.9)	17.6	(1.0)	27.1	(1.4)	21.6	(1.3)	4.8	(0.6)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.11

Literacy and numeracy — Average scores and scores at 5th, 25th, 75th, and 95th percentiles by occupation of population aged 16 to 65, by age group, Canada, 2012

Skill, occupation and age group	5 th percentile		25 th percentile		Average	Standard error	75 th percentile		95 th percentile	
	scores	standard error	scores	standard error			scores	standard error	scores	standard error
Literacy										
Managerial and professional occupations										
16 to 24	221.3	(7.3)	269.6	(5.3)	292.7	(2.3)	319.8	(4.0)	353.6	(6.3)
25 to 34	227.9	(4.5)	276.5	(3.2)	301.9	(1.6)	330.3	(2.1)	364.1	(3.7)
35 to 44	222.3	(4.2)	271.6	(2.5)	296.4	(1.6)	324.2	(2.0)	360.2	(3.7)
45 to 54	211.2	(4.3)	258.1	(2.8)	287.4	(1.5)	319.2	(2.6)	355.3	(3.5)
55 to 65	204.1	(5.7)	252.6	(2.6)	281.4	(1.7)	312.7	(2.7)	349.4	(3.9)
Service and support occupations										
16 to 24	208.2	(5.2)	253.3	(4.0)	277.8	(1.7)	304.7	(3.3)	341.7	(4.6)
25 to 34	200.9	(7.4)	246.6	(3.4)	274.2	(2.5)	304.3	(4.9)	340.9	(6.9)
35 to 44	178.9	(10.4)	236.2	(5.7)	265.9	(3.0)	299.4	(4.4)	337.2	(4.8)
45 to 54	166.1	(9.2)	224.9	(5.0)	254.7	(2.6)	287.9	(3.4)	328.4	(5.2)
55 to 65	168.2	(14.5)	220.9	(4.2)	248.4	(2.5)	280.3	(3.8)	315.1	(7.0)
Trade, production, and manufacturing occupations										
16 to 24	188.5	(13.2)	239.7	(8.3)	270.5	(4.1)	302.8	(7.3)	339.3	(13.2)
25 to 34	182.5	(8.9)	231.5	(6.9)	262.6	(3.4)	296.7	(5.8)	334.4	(8.9)
35 to 44	168.7	(12.0)	227.0	(7.0)	258.6	(4.2)	295.0	(5.0)	333.8	(9.5)
45 to 54	149.9	(17.7)	218.9	(4.9)	249.4	(3.2)	286.0	(5.7)	325.1	(6.6)
55 to 65	169.4	(13.1)	221.4	(4.8)	250.0	(2.8)	282.1	(3.9)	319.1	(8.0)
Manual and other service occupations										
16 to 24	190.7	(10.7)	240.6	(7.1)	269.9	(3.1)	300.9	(5.0)	342.2	(15.9)
25 to 34	160.4	(16.3)	224.1	(10.3)	256.8	(5.4)	289.6	(11.0)	344.7	(16.6)
35 to 44	133.8	(20.6)	209.5	(9.8)	237.8	(5.5)	272.0	(9.8)	311.8	(11.4)
45 to 54	123.7	(16.8)	199.3	(14.8)	233.5	(6.2)	273.3	(10.1)	313.2	(8.5)
55 to 65	144.1	(19.1)	203.9	(10.3)	229.8	(5.2)	260.3	(8.9)	296.1	(17.1)
Numeracy										
Managerial and professional occupations										
16 to 24	207.1	(8.1)	256.3	(5.0)	286.4	(2.5)	317.5	(4.3)	359.2	(6.5)
25 to 34	213.4	(4.9)	264.7	(4.0)	294.3	(1.8)	326.0	(2.9)	366.2	(4.5)
35 to 44	209.5	(5.5)	261.8	(2.6)	289.9	(1.6)	320.8	(2.6)	362.2	(4.9)
45 to 54	197.4	(6.2)	249.5	(3.0)	281.7	(1.5)	315.2	(2.3)	358.6	(4.0)
55 to 65	194.6	(4.8)	244.1	(2.9)	275.9	(2.0)	309.6	(3.8)	352.6	(4.6)
Service and support occupations										
16 to 24	191.1	(7.1)	238.3	(3.5)	268.6	(2.0)	300.1	(2.5)	342.9	(4.6)
25 to 34	178.1	(7.7)	225.9	(5.5)	258.2	(3.0)	291.8	(4.3)	331.4	(8.2)
35 to 44	159.8	(10.4)	220.4	(6.1)	253.1	(3.3)	288.3	(5.2)	333.9	(7.3)
45 to 54	155.5	(9.2)	211.4	(5.1)	244.8	(3.0)	281.3	(4.2)	323.0	(7.7)
55 to 65	151.3	(7.5)	205.3	(5.7)	237.5	(3.0)	272.1	(3.8)	315.6	(7.8)
Trade, production, and manufacturing occupations										
16 to 24	182.4	(11.7)	235.4	(8.3)	267.9	(4.7)	303.8	(10.0)	344.4	(11.2)
25 to 34	175.1	(11.9)	223.6	(6.2)	263.3	(3.7)	303.3	(5.7)	339.5	(9.7)
35 to 44	161.4	(15.0)	219.3	(6.4)	256.5	(4.0)	295.8	(6.7)	336.7	(9.5)
45 to 54	134.1	(19.2)	213.5	(6.1)	247.6	(3.6)	289.1	(3.6)	329.9	(8.0)
55 to 65	153.9	(16.2)	211.6	(5.5)	244.1	(3.2)	278.8	(4.6)	321.6	(7.7)
Manual and other service occupations										
16 to 24	178.9	(10.1)	230.5	(7.1)	263.3	(3.3)	297.6	(5.4)	342.5	(13.4)
25 to 34	151.1	(13.1)	211.5	(11.2)	247.2	(5.9)	285.8	(10.4)	333.3	(17.1)
35 to 44	119.2	(20.5)	187.6	(13.1)	224.4	(5.7)	263.8	(11.5)	310.7	(10.8)
45 to 54	86.7	(23.5)	183.5	(13.6)	218.2	(7.3)	262.8	(12.9)	307.3	(9.6)
55 to 65	126.0	(17.9)	184.5	(14.3)	217.3	(6.5)	251.5	(12.1)	299.9	(20.1)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.12

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by occupation, Canada, 2012

Occupation	PS-TRE non-respondents		Below level 1		Level 1		Level 2		Level 3	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Managerial and professional occupations	8.7	(0.4)	10.6	(0.7)	31.0	(0.9)	38.5	(0.9)	11.2	(0.7)
Service and support occupations	16.3	(0.8)	16.5	(0.8)	32.9	(1.3)	29.2	(1.2)	5.1	(0.7)
Trade, production, and manufacturing	27.1	(1.2)	22.2	(1.2)	29.8	(1.5)	18.3	(1.2)	2.7	(0.6)
Manual and other service occupations	27.1	(1.5)	19.7	(1.8)	28.0	(2.1)	21.3	(1.9)	4.0	(1.1)

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.2.13

Literacy, numeracy and PS-TRE — Information processing skills of Canadians in each occupation, population aged 16 to 65, by highest level of completed education, Canada, 2012

Occupation	Postsecondary education - bachelor's degree or higher						Postsecondary education - below bachelor's degree						High school diploma						Less than High School						All education levels combined				
	Literacy		Numeracy		PS-TRE		Literacy		Numeracy		PS-TRE		Literacy		Numeracy		PS-TRE		Literacy		Numeracy		PS-TRE						
	%	s.e.	avg.	s.e.	%	s.e.	%	s.e.	avg.	s.e.	%	s.e.	%	s.e.	avg.	s.e.	%	s.e.	%	s.e.	avg.	s.e.	%	s.e.					
Managerial and professional occupations	22	306	(1.1)	302	(1.0)	59	(1.2)	18	286	(1.3)	278	(1.4)	45	(1.4)	8	280	(1.9)	271	(2.1)	43	(2.3)	2	253	(4.1)	245	(4.4)	27	(3.9)	50
Service and support occupations	4	279	(2.8)	269	(3.6)	39	(3.6)	9	270	(1.9)	257	(2.1)	33	(2.1)	9	267	(1.9)	255	(2.1)	37	(2.2)	4	246	(2.9)	235	(3.2)	27	(3.3)	26
Trade, production, and manufacturing occupations	1	271	(5.4)	279	(6.2)	33	(5.6)	7	269	(2.1)	271	(2.3)	27	(2.2)	5	258	(3.3)	251	(3.6)	19	(2.6)	3	224	(3.3)	215	(3.3)	8	(1.8)	16
Manual and other service occupations	0	274	(8.2)	263	(8.5)	36	(8.8)	2	263	(4.6)	254	(4.9)	28	(4.4)	3	261	(3.1)	251	(3.7)	29	(3.1)	2	226	(3.9)	214	(4.5)	17	(2.8)	7
All occupation levels combined	27	...	...	...	...	...	...	36	...	...	...	...	...	...	25	...	...	...	...	...	...	...	11	...	...	...	...	...	99

... not applicable.

0 True zero or a value rounded to zero.

 Notes: avg.: Average.
s.e.: Standard error.

Source: Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.1

Literacy — Averages and proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012

Region and Aboriginal identification	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
Ontario										
Aboriginal	16.7	(2.3)	35.5	(3.6)	38.2	(3.3)	9.5	(2.5)	268.9	(3.3)
Non-Aboriginal	14.9	(0.8)	31.7	(1.4)	38.4	(1.3)	15.0	(0.9)	275.8	(1.0)
Manitoba										
Aboriginal	23.2	(3.5)	37.9	(3.7)	32.1	(3.4)	6.8	(1.3)	259.2	(4.3)
Non-Aboriginal	15.1	(1.5)	31.5	(2.4)	38.3	(2.2)	15.1	(1.9)	275.9	(2.1)
Saskatchewan										
Aboriginal	32.6	(3.7)	37.7	(4.4)	24.0	(3.0)	5.7	(2.0)	248.2	(4.2)
Non-Aboriginal	15.5	(1.8)	32.0	(2.4)	40.6	(2.1)	11.8	(1.7)	274.3	(2.3)
British Columbia										
Aboriginal	19.1	(3.2)	35.5	(4.5)	37.2	(4.5)	8.2	(2.6)	265.7	(3.5)
Non-Aboriginal	16.6	(1.3)	28.8	(1.7)	38.8	(1.9)	15.7	(1.5)	275.3	(1.9)
Yukon										
Aboriginal	38.3	(11.5)	31.0	(8.4)	26.0	(10.0)	4.7	(5.9)	241.6	(17.3)
Non-Aboriginal	10.1	(5.5)	27.0	(7.1)	43.4	(9.2)	19.4	(6.2)	287.5	(10.9)
Northwest Territories										
Aboriginal	47.0	(7.6)	35.4	(4.4)	14.5	(4.2)	3.1	(1.8)	228.6	(8.9)
Non-Aboriginal	14.6	(2.5)	29.0	(3.1)	38.9	(2.7)	17.5	(2.8)	280.1	(3.7)
Nunavut										
Aboriginal	63.8	(3.0)	28.1	(2.3)	7.6	(1.9)	0.5	(0.4)	206.7	(4.3)
Non-Aboriginal	9.1	(2.7)	24.4	(5.2)	46.6	(6.2)	19.9	(4.8)	290.0	(3.4)
Canada										
Aboriginal	24.1	(1.4)	35.6	(1.7)	31.9	(1.5)	8.4	(1.1)	260.0	(1.9)
Non-Aboriginal	16.2	(0.5)	31.9	(0.7)	37.8	(0.7)	14.1	(0.5)	274.0	(0.6)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.2

Numeracy — Averages and proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012

Region and Aboriginal identification	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
Ontario										
Aboriginal	26.9	(3.1)	40.4	(3.0)	27.1	(3.1)	5.6	(1.4)	251.7	(3.5)
Non-Aboriginal	22.3	(0.9)	31.2	(1.1)	32.8	(1.3)	13.6	(0.9)	266.6	(1.2)
Manitoba										
Aboriginal	33.8	(3.5)	34.6	(3.6)	25.6	(3.2)	6.0	(1.6)	245.4	(4.8)
Non-Aboriginal	20.6	(1.8)	32.4	(2.1)	34.7	(2.6)	12.3	(1.9)	266.7	(2.6)
Saskatchewan										
Aboriginal	45.2	(3.9)	33.5	(3.7)	17.5	(2.6)	3.7	(1.7)	231.6	(4.8)
Non-Aboriginal	21.4	(2.0)	32.6	(2.4)	34.8	(2.6)	11.2	(1.5)	266.3	(2.1)
British Columbia										
Aboriginal	29.0	(3.5)	37.3	(4.6)	27.6	(4.0)	6.0	(2.3)	250.4	(4.4)
Non-Aboriginal	21.9	(1.5)	29.8	(2.0)	34.4	(2.0)	13.9	(1.4)	267.0	(1.9)
Yukon										
Aboriginal	47.7	(10.1)	34.0	(9.7)	15.6	(9.2)	2.7	(1.5)	224.4	(16.7)
Non-Aboriginal	18.2	(7.6)	30.1	(6.9)	36.2	(8.8)	15.5	(4.7)	274.3	(9.4)
Northwest Territories										
Aboriginal	60.4	(6.8)	26.2	(4.7)	11.9	(3.3)	1.5	(1.0)	210.2	(10.0)
Non-Aboriginal	19.9	(3.0)	31.5	(3.0)	33.1	(2.7)	15.4	(2.7)	271.2	(4.5)
Nunavut										
Aboriginal	76.1	(2.7)	18.8	(2.3)	x	x	x	x	186.6	(4.6)
Non-Aboriginal	12.8	(2.9)	31.8	(4.6)	40.1	(5.6)	15.3	(3.4)	279.1	(3.0)
Canada										
Aboriginal	35.3	(1.9)	34.5	(1.6)	24.0	(1.9)	6.2	(0.9)	244.3	(2.7)
Non-Aboriginal	22.1	(0.5)	32.1	(0.5)	33.0	(0.7)	12.9	(0.4)	266.2	(0.7)

x suppressed to meet the confidentiality requirements of the Statistics Act.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.3

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by Aboriginal identification, Canada and oversampled populations, 2012

Region and Aboriginal identification	Level 1 or below		Level 2		Level 3		PS-TRE non-respondents	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Ontario								
Aboriginal	48.0	(3.2)	31.6	(3.4)	4.3	(1.4)	16.2	(1.6)
Non-Aboriginal	44.3	(1.2)	31.4	(1.2)	7.8	(0.8)	16.4	(0.8)
Manitoba								
Aboriginal	48.1	(3.8)	26.8	(3.0)	3.7	(1.4)	21.3	(3.1)
Non-Aboriginal	40.7	(2.4)	29.8	(1.8)	6.4	(1.5)	23.1	(1.9)
Saskatchewan								
Aboriginal	58.6	(3.8)	19.4	(3.1)	1.8	(0.7)	20.1	(3.1)
Non-Aboriginal	53.2	(2.2)	29.3	(2.0)	5.1	(1.1)	12.4	(1.0)
British Columbia								
Aboriginal	45.9	(4.5)	29.3	(4.2)	5.8	(1.8)	19.0	(3.2)
Non-Aboriginal	41.1	(1.9)	31.9	(2.0)	8.3	(1.3)	18.7	(1.4)
Yukon								
Aboriginal	57.7	(9.7)	15.5	(7.2)	1.9	(1.7)	25.0	(8.5)
Non-Aboriginal	45.5	(10.3)	32.0	(6.6)	10.2	(6.7)	12.3	(4.6)
Northwest Territories								
Aboriginal	47.8	(5.3)	14.2	(3.8)	1.8	(1.5)	36.3	(3.3)
Non-Aboriginal	47.8	(4.0)	33.1	(3.5)	8.8	(2.4)	10.3	(1.6)
Nunavut								
Aboriginal	39.9	(3.2)	x	x	x	x	54.3	(3.4)
Non-Aboriginal	34.1	(7.0)	36.0	(7.5)	6.5	(2.8)	23.4	(2.8)
Canada								
Aboriginal	48.7	(1.8)	25.8	(1.7)	4.5	(1.0)	21.0	(1.2)
Non-Aboriginal	45.6	(0.6)	30.2	(0.5)	7.4	(0.4)	16.9	(0.4)

x suppressed to meet the confidentiality requirements of the Statistics Act.

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.4

Literacy — Averages and proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012

Region and immigrant status	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
Quebec										
Recent Immigrant	29.3	(2.9)	35.3	(3.3)	28.3	(2.5)	7.1	(1.7)	252.3	(3.3)
Established immigrant	29.6	(2.5)	32.9	(2.8)	29.6	(2.8)	7.9	(1.7)	252.6	(3.0)
Canadian-born	16.9	(0.7)	34.4	(0.9)	36.9	(0.8)	11.9	(0.6)	271.7	(0.9)
Ontario										
Recent Immigrant	24.0	(2.2)	37.6	(2.9)	31.6	(2.6)	6.8	(1.6)	257.0	(2.9)
Established immigrant	25.3	(2.1)	35.6	(3.1)	30.5	(2.6)	8.6	(1.6)	257.5	(2.4)
Canadian-born	9.5	(0.9)	29.9	(1.6)	42.4	(1.7)	18.3	(1.2)	285.4	(1.3)
British Columbia										
Recent Immigrant	30.2	(3.3)	30.8	(3.3)	30.0	(3.3)	8.9	(2.0)	253.3	(3.9)
Established immigrant	27.5	(3.8)	31.4	(4.3)	32.3	(4.6)	8.8	(2.4)	256.5	(4.8)
Canadian-born	11.0	(1.3)	27.8	(1.9)	42.5	(2.4)	18.7	(1.9)	284.7	(2.1)
Canada										
Recent Immigrant	27.7	(1.5)	35.2	(1.9)	29.8	(1.5)	7.3	(0.9)	254.2	(1.9)
Established immigrant	26.4	(1.5)	34.1	(2.2)	30.7	(2.1)	8.9	(1.1)	257.2	(1.8)
Canadian-born	12.9	(0.5)	31.3	(0.8)	40.2	(0.8)	15.7	(0.6)	279.6	(0.7)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.5

Numeracy — Averages and proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012

Region and immigrant status	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
Quebec										
Recent immigrant	30.1	(2.9)	34.0	(3.8)	27.1	(3.4)	8.7	(1.7)	251.7	(3.6)
Established immigrant	33.5	(2.5)	30.4	(3.0)	25.9	(2.9)	10.2	(1.8)	249.5	(3.3)
Canadian-born	19.4	(0.8)	35.2	(1.0)	34.3	(0.8)	11.1	(0.6)	267.8	(0.8)
Ontario										
Recent immigrant	32.5	(2.6)	33.1	(2.8)	26.0	(2.5)	8.4	(1.5)	248.9	(3.0)
Established immigrant	32.4	(2.2)	30.4	(2.3)	27.8	(2.4)	9.5	(1.5)	251.2	(2.6)
Canadian-born	17.0	(1.1)	31.7	(1.3)	35.6	(1.7)	15.6	(1.2)	274.8	(1.6)
British Columbia										
Recent immigrant	35.5	(3.2)	26.6	(3.2)	27.7	(2.6)	10.2	(1.9)	246.8	(4.4)
Established immigrant	32.5	(4.4)	30.3	(4.4)	27.0	(4.6)	10.2	(2.8)	251.3	(5.3)
Canadian-born	16.9	(1.6)	30.4	(2.4)	37.5	(2.5)	15.2	(1.7)	274.4	(2.1)
Canada										
Recent immigrant	33.9	(1.6)	31.3	(1.6)	25.8	(1.4)	9.0	(0.9)	248.0	(2.0)
Established immigrant	32.7	(1.7)	30.4	(1.8)	26.9	(2.0)	10.0	(1.0)	251.4	(2.0)
Canadian-born	18.9	(0.6)	32.8	(0.6)	34.7	(0.8)	13.6	(0.5)	270.8	(0.8)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.6

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by immigrant status, Canada and oversampled populations, 2012

Region and immigrant status	Level 1 or below		Level 2		Level 3		PS-TRE non-respondents	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Quebec								
Recent immigrant	60.1	(2.7)	20.5	(2.7)	4.6	(1.7)	14.8	(1.9)
Established immigrant	47.1	(3.3)	22.2	(3.1)	4.4	(1.6)	26.3	(2.3)
Canadian-born	50.3	(0.9)	27.7	(0.8)	6.1	(0.4)	15.9	(0.6)
Ontario								
Recent immigrant	50.2	(2.6)	23.3	(2.1)	2.7	(0.9)	23.8	(2.1)
Established immigrant	47.4	(2.8)	21.8	(2.2)	4.4	(1.1)	26.4	(1.8)
Canadian-born	42.4	(1.6)	36.1	(1.6)	9.7	(1.2)	11.8	(0.9)
British Columbia								
Recent immigrant	46.1	(3.5)	22.4	(2.5)	5.8	(1.9)	25.6	(3.0)
Established immigrant	40.9	(4.2)	22.1	(3.8)	5.3	(2.5)	31.7	(3.5)
Canadian-born	40.9	(2.4)	36.0	(2.4)	9.6	(1.5)	13.6	(1.8)
Canada								
Recent immigrant	51.4	(1.6)	21.9	(1.3)	3.7	(0.7)	23.0	(1.2)
Established immigrant	45.7	(2.0)	22.1	(1.6)	4.7	(0.8)	27.5	(1.3)
Canadian-born	45.2	(0.8)	32.5	(0.7)	8.2	(0.5)	14.1	(0.5)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.7

Literacy — Averages and proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012

Region and official-language minority	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
New Brunswick										
Anglophone	15.8	(1.9)	33.0	(2.2)	38.7	(2.1)	12.4	(1.6)	273.8	(2.2)
Francophone	23.9	(2.3)	38.3	(2.3)	30.5	(2.4)	7.2	(1.3)	258.6	(2.3)
Quebec										
Anglophone	15.5	(2.1)	30.4	(2.9)	39.6	(3.0)	14.5	(1.9)	276.3	(2.8)
Francophone	17.6	(0.8)	34.7	(1.0)	36.0	(0.9)	11.6	(0.6)	270.5	(1.0)
Ontario										
Anglophone	11.1	(0.9)	31.1	(1.5)	40.9	(1.5)	16.9	(1.2)	282.2	(1.3)
Francophone	13.2	(2.6)	34.6	(4.2)	39.7	(3.8)	12.5	(2.9)	275.2	(3.6)
Manitoba										
Anglophone	11.6	(1.4)	32.1	(2.5)	41.1	(2.5)	15.2	(1.8)	280.0	(2.3)
Francophone	13.1	(4.4)	33.3	(6.2)	35.3	(5.2)	18.3	(4.9)	279.5	(5.6)
Outside Quebec										
Anglophone	12.0	(0.6)	30.7	(0.9)	40.8	(1.0)	16.5	(0.7)	281.2	(0.9)
Francophone	17.4	(1.9)	34.4	(2.7)	35.9	(2.7)	12.3	(2.2)	270.4	(2.3)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.8

Numeracy — Averages and proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012

Region and official-language minority	Level 1 or below		Level 2		Level 3		Level 4 or 5		Average	Standard error
	percent	standard error	percent	standard error	percent	standard error	percent	standard error		
New Brunswick										
Anglophone	25.9	(2.1)	34.7	(2.6)	30.2	(2.2)	9.2	(1.5)	259.2	(2.4)
Francophone	31.6	(2.2)	36.4	(2.4)	26.3	(2.1)	5.7	(1.4)	249.1	(2.5)
Quebec										
Anglophone	20.7	(2.0)	29.5	(2.7)	33.1	(3.3)	16.7	(2.7)	271.2	(2.9)
Francophone	19.6	(0.8)	35.8	(1.0)	33.9	(0.9)	10.7	(0.6)	266.9	(0.8)
Ontario										
Anglophone	19.5	(1.1)	31.4	(1.4)	34.5	(1.6)	14.7	(1.1)	271.5	(1.6)
Francophone	18.6	(3.0)	37.2	(3.8)	33.5	(4.0)	10.7	(2.7)	266.5	(4.0)
Manitoba										
Anglophone	17.2	(1.8)	33.8	(2.5)	37.4	(2.9)	11.7	(2.1)	270.4	(2.8)
Francophone	19.3	(5.5)	35.8	(6.2)	28.8	(5.1)	16.1	(4.7)	271.7	(6.5)
Outside Quebec										
Anglophone	19.5	(0.7)	31.6	(0.7)	34.6	(1.0)	14.2	(0.6)	270.8	(1.0)
Francophone	23.1	(2.1)	35.4	(2.7)	30.0	(2.8)	11.5	(1.9)	262.8	(2.6)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.3.9

PS-TRE — Comparative distributions of proficiency levels of population aged 16 to 65, by official-language minority, Canada and oversampled populations, 2012

Region and official-language minority	Level 1 or below		Level 2		Level 3		PS-TRE non-respondents	
	percent	standard error	percent	standard error	percent	standard error	percent	standard error
New Brunswick								
Anglophone	44.6	(2.8)	30.1	(2.5)	6.4	(1.6)	19.0	(1.6)
Francophone	50.1	(2.7)	20.0	(2.2)	2.9	(1.1)	27.0	(1.8)
Quebec								
Anglophone	47.2	(3.2)	34.3	(3.0)	7.8	(1.5)	10.7	(1.4)
Francophone	50.5	(0.9)	27.3	(0.8)	5.9	(0.5)	16.3	(0.6)
Ontario								
Anglophone	43.3	(1.4)	34.3	(1.4)	9.1	(1.1)	13.3	(0.9)
Francophone	46.8	(4.2)	31.0	(4.1)	3.1	(1.7)	19.0	(2.4)
Manitoba								
Anglophone	40.4	(2.5)	33.5	(2.2)	6.2	(1.8)	19.9	(2.1)
Francophone	52.0	(6.2)	27.5	(5.5)	8.3	(4.3)	12.3	(2.8)
Outside Quebec								
Anglophone	43.6	(0.9)	33.7	(0.8)	8.6	(0.7)	14.1	(0.6)
Francophone	46.3	(2.9)	27.3	(2.7)	4.7	(1.4)	21.6	(1.8)

Source: The Programme for the International Assessment of Adult Competencies, 2012.

Table B.4.1

Literacy and numeracy — Averages and proficiency levels of population aged 16 to 65 in ALL and PIAAC, Canada, 2003 and 2012

Skill and survey	Average	Standard error	Below level 1		Level 1		Level 2		Level 3		Level 4 or 5	
			percent	standard error	percent	standard error	percent	standard error	percent	standard error	percent	standard error
Literacy												
ALL	280.1	(0.7)	4.5	(0.3)	9.7	(0.5)	26.8	(0.8)	41.0	(0.9)	17.9	(0.7)
PIAAC	273.5	(0.6)	3.8	(0.2)	12.7	(0.5)	32.0	(0.7)	37.6	(0.7)	13.9	(0.5)
Numeracy												
ALL	272.4	(0.7)	5.1	(0.3)	12.5	(0.6)	31.1	(0.9)	37.1	(0.9)	14.3	(0.6)
PIAAC	265.5	(0.7)	6.0	(0.3)	16.6	(0.5)	32.1	(0.5)	32.6	(0.7)	12.7	(0.4)

Sources: The Programme for the International Assessment of Adult Competencies, 2012 and International Adult Literacy and Skills Survey, 2003.

Annex C - List of partners

A study of the size and magnitude of PIAAC cannot be efficiently conducted by a single agency. The expense and workload is such that efforts of this scope can only be successful with the help of dedicated professionals working in agencies from across the country and, indeed, given its international scope, from around the world. We would like to gratefully acknowledge our supporters.

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