Literacy as a key to Social and Economic Development: Findings from the International Adult Literacy Survey (IALS)

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Statistics Canada Statistique Canada

Why we care about skills and learning: Sources of policy interest

- Skills are important to several pressing policy issues;
  - concerns about skill barriers to economic growth, productivity growth and rates of technological innovation
  - concerns about the role of skill in creating social inequity in economic outcomes
  - concerns about the quality of educational output
  - concerns about skill barriers to efficiency and effectiveness in the provision of public goods and services
- Key policy drivers:
  - demographics
  - globalization of markets
  - multinationals
  - diffusion of information and communication technologies
  - competition from the developing world

Policy Questions Related to Skills

- What level of skill demand is required to meet economic objectives?
- What level of skill demand is required to meet social objectives e.g. active social participation, tolerance?
- What are current levels of skill demand in various contexts i.e. at work, at home, in the community? How is demand expected to change over the medium term?
- What is the current supply of skill? How is the supply of skill expected to evolve over the medium term?
- Is the supply of skill adequate to meet anticipated social and economic demand?
- Is there evidence that macroeconomic growth (productivity growth, technical innovation) are constrained by skill shortages?

Policy Questions Related to Skills (cont'd)

- If not what is the nature of any identified skill deficits?
- What role could the initial education system play in meeting these skill deficits? Could improvements in the quantity, quality or social distribution of skill flowing out of the initial education system meet expected demand?
- What role could the adult learning system – formal, informal, non-formal-play in generating missing skill?

Policy Questions Related to Skills (cont'd)

- **Is there evidence of market failure? To what extent is the social, economic, educational and health opportunity of individuals constrained by their skill level?**
- **To what extent can observed social inequities in adult outcomes be attributed to inequitable distributions of skill at earlier stages?**
- **To what degree do rapidly increasing skill levels in developing nations pose a threat to the economic performance of OECD countries?**
- **To what degree, and in what way, can government mitigate market failure, particularly in the adult learning system? Should they intervene on the demand side, the supply side or both?**

Skill Demand By Life Context

The Community

- Consumer markets
- Health
- Citizenship
- Culture
- Education

Narrowly Portable

Firm & Job Specific Skills and bodies of knowledge

Creative
Fluid
Crystallized
Practical

…depend upon

Using tools associated with pervasive technologies of production e.g. ICT's

Analytic Problem Solving
- decision making
- job task planning and organizing
- significant use of memory

Workplace Inter-Personal
- teamwork
- leadership
- practical intelligence

Creative
Fluid
Crystallized
Practical

…depend upon

Key Competences

Motor Skills

Numeracy

Oral Communication
- Speaking
- listening

Intra-personal Ability to Learn
- Motivation
- metacognition

Written Communications
- reading - text
- reading - document
- writing

Creative
Fluid
Crystallized
Practical

Fully Portable

The World of Work

Home Environment

- Family
- Culture
- Health

Largely Portable

Essential skills:

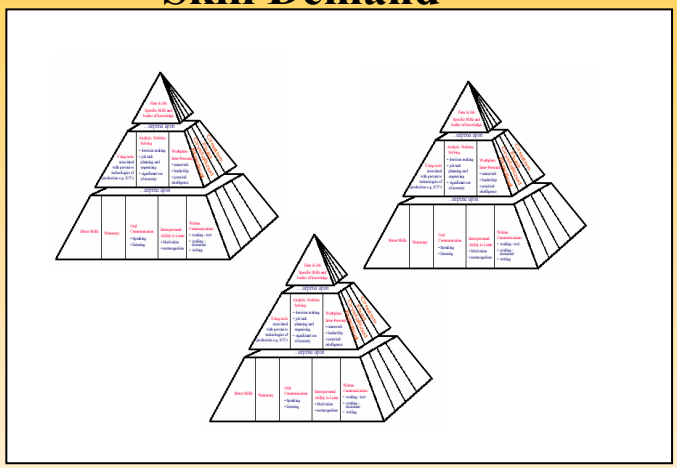
- Are useful in multiple life contexts;
- Are associated with social, economic , educational and health outcomes;
- Can be learned and taught;
- Improve individual's ability to adapt to change and to shape their environment.

Canada's skills data systems

The Essential Skills identified by HRSDC's ESRP are:	Equivalent Skills measured by Statistics Canada in ALL
– Reading Text	Prose literacy
– Document Use	Document literacy
– Writing	
– Numeracy (Math)	Numeracy
– Oral Communication	Speaking and listening
– Thinking Skills, including:	
· Problem Solving	
· Decision Making	
· Job Task Planning and Organizing	Problem solving
· Significant Use of Memory	
· finding Information	
– Working with Others	Teamwork
– Computer Use	ICTL
– Continuous Learning	Adult education and training participation

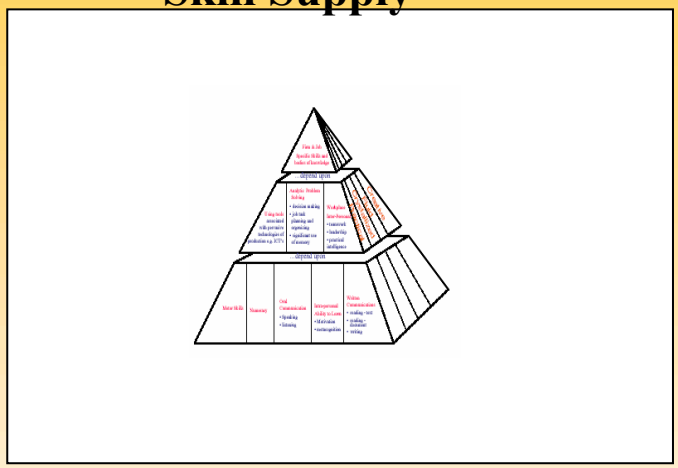
Theoretical Framework:
A "Markets" model of skill

Skill Demand



Markets for skill

Skill Supply



Outcomes

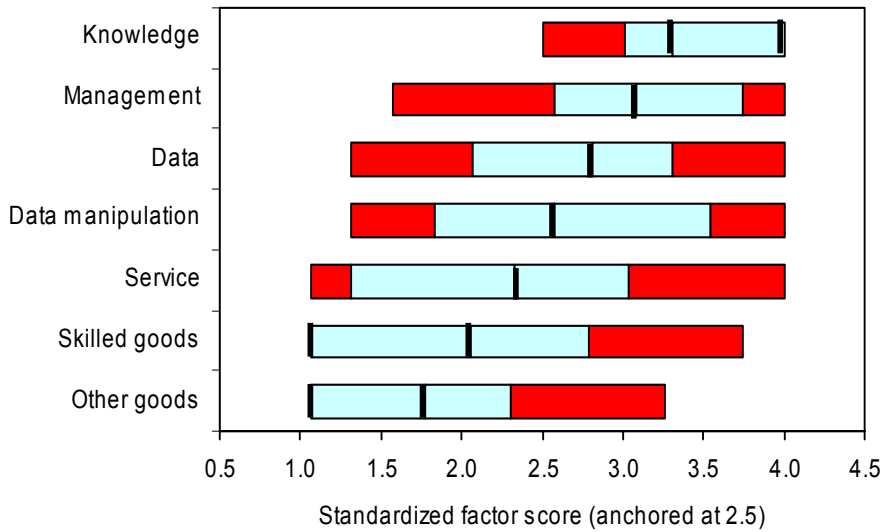
Context	MICRO (Individuals)	MESO (Social Institutions)	MACRO (Systems)
• Economic			
• Social			
• Educational			
• Health			

Outcomes associated with skill

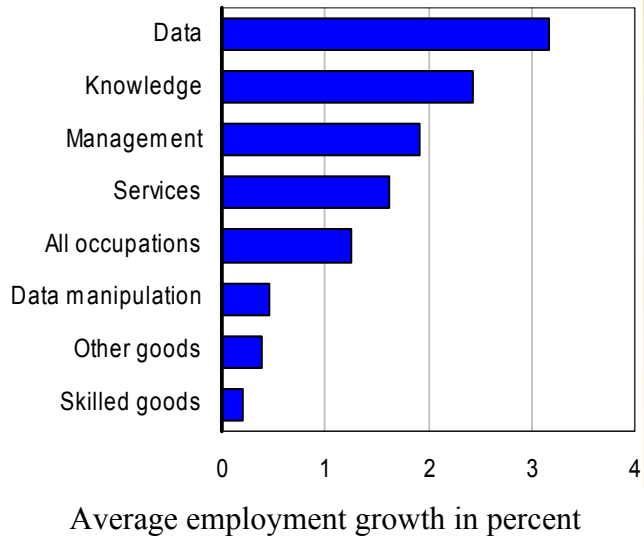
	MICRO (individuals)	MESO (firms, communities, schools, families)	MACRO (economies, societies, regions, special population)
Economic	• employability • wages • reliance on social transfers	• firm profitability • productivity • adaptability of firms and communities • power distributions within families	• overall growth rates • speed of adjustment
Social	• volunteering • community participation		• trust • social capital
Health	• physical health • mental health • mortality • morbidity	• institutional efficiency • insurance costs	• equity • opportunity costs
Educational	• access • persistence to completion • skill level	• inclusion • average • quality	

The demand for skill is rising rapidly in the Canadian economy…

A. **Distribution of reading demand at work at the 10th, 25th, 50th, 75th and 90th percentiles on a standardized factor scale by aggregated occupational groups, employed population aged 25 to 65, Canada, 1993-1998**



B. **Average employment growth by aggregated occupational groups, employed population aged 25 to 65, Canada, 1993-1998**



Reading demand and employment growth by aggregated occupational groups

Occupational groups are ranked by the median of reading demand at work

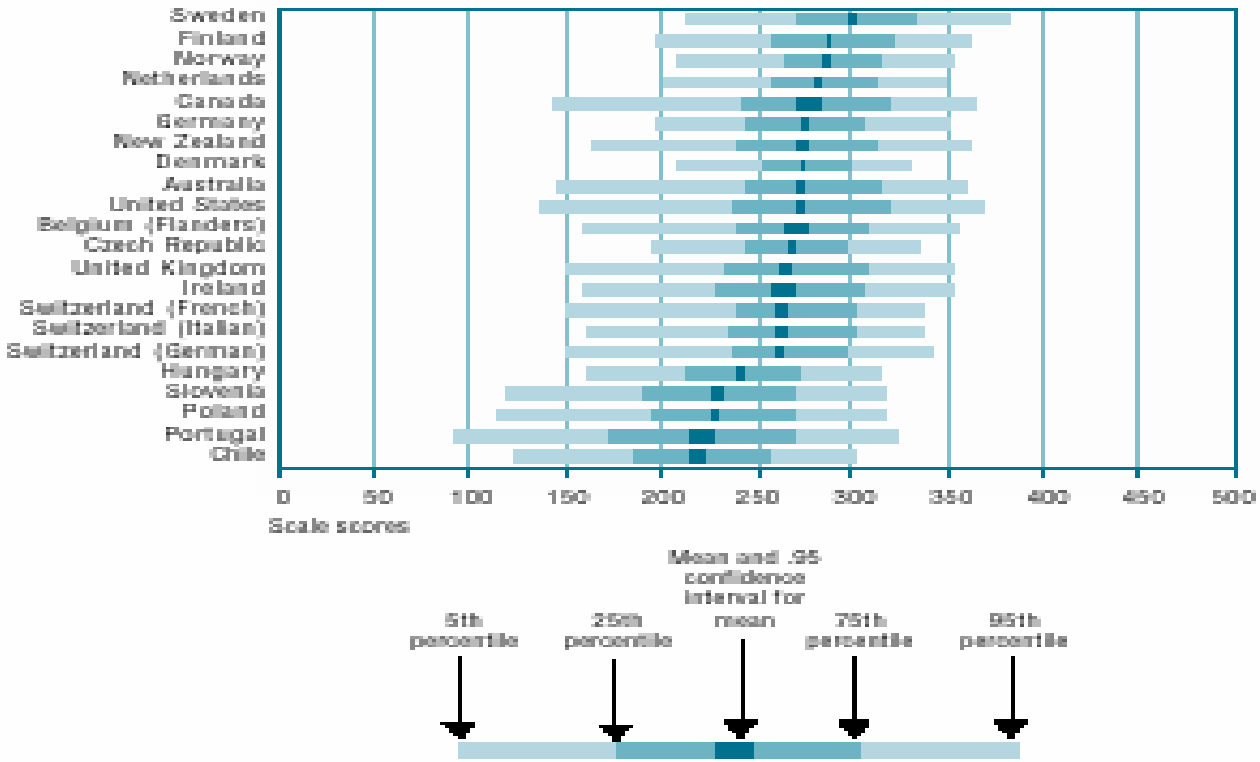
Source: International Adult Literacy Survey

Canada's average skill level is relatively high but we have a very wide range of skill…

FIGURE 2.1

DISTRIBUTION OF LITERACY SCORES

A. Mean scores with .95 confidence interval and scores at 5th, 25th, 75th, and 95th percentiles on the prose literacy scale, population aged 16-65, 1994-1998



Countries are ranked by mean scores.

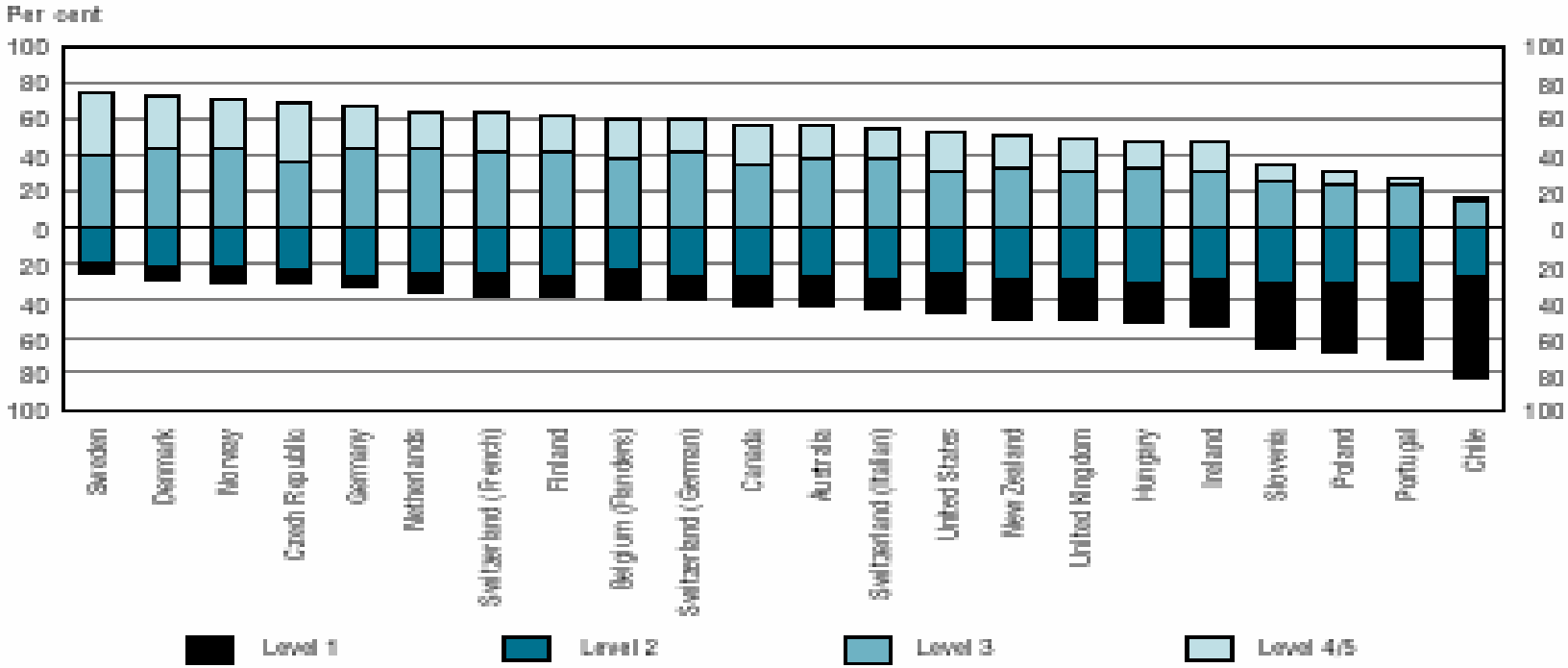
Adult Literacy and Lifeskills Survey

Canada has a relatively large proportion of adults below level 3…

FIGURE 2.2 (concluded)

COMPARATIVE DISTRIBUTION OF LITERACY LEVELS

C. Per cent of population aged 16-65 at each quantitative literacy level, 1994-1998



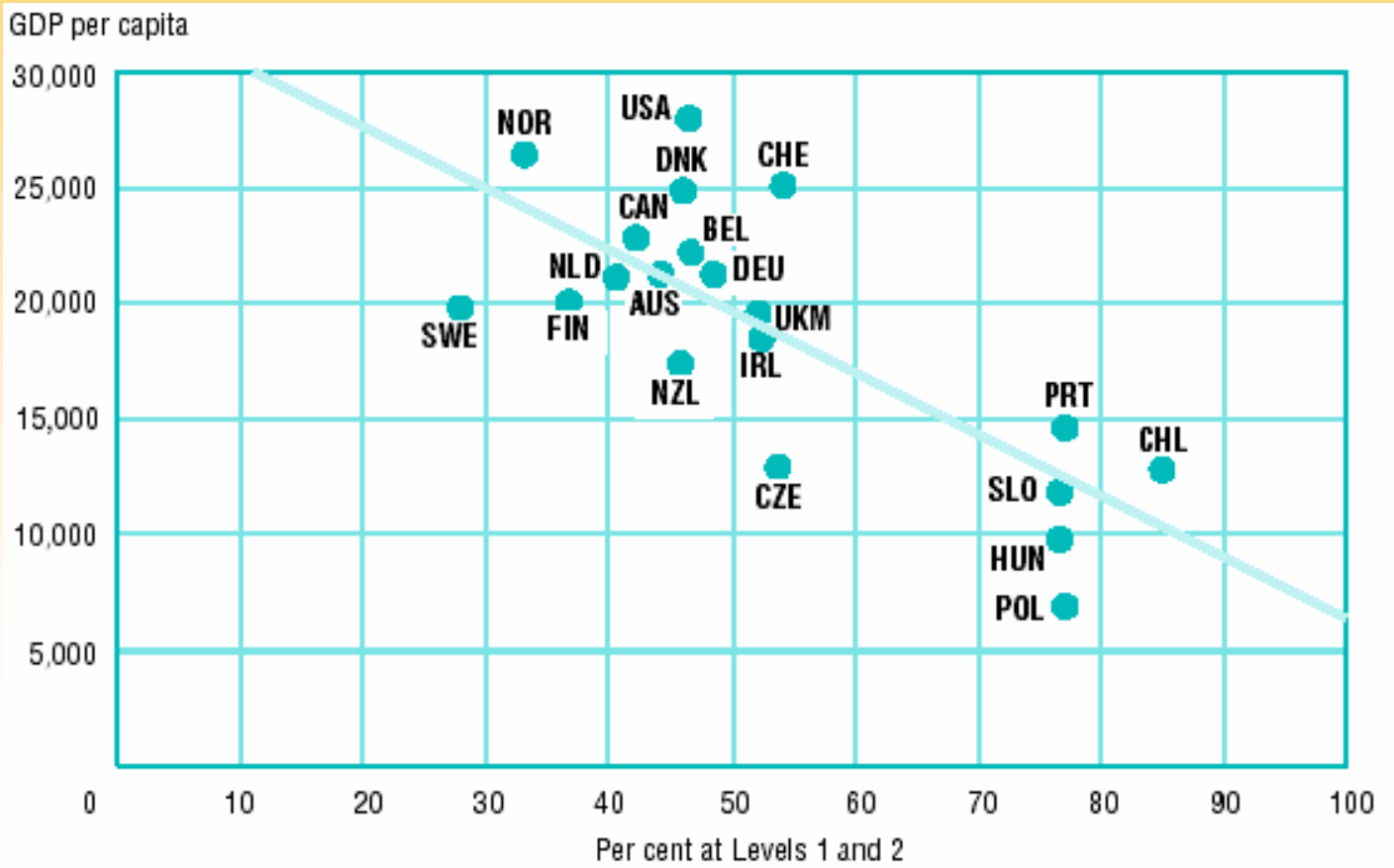
Countries are ranked by the proportion in Levels 3 and 4/5.

Source: International Adult Literacy Survey, 1994-1998.

Analyses reveal a strong relationship between various indicators of macro-economic performance

GDP PER CAPITA AND LITERACY

A. Relationship between GDP per capita1 and per cent at prose literacy Levels 1 and 2, population aged 16-65, 1994-1998

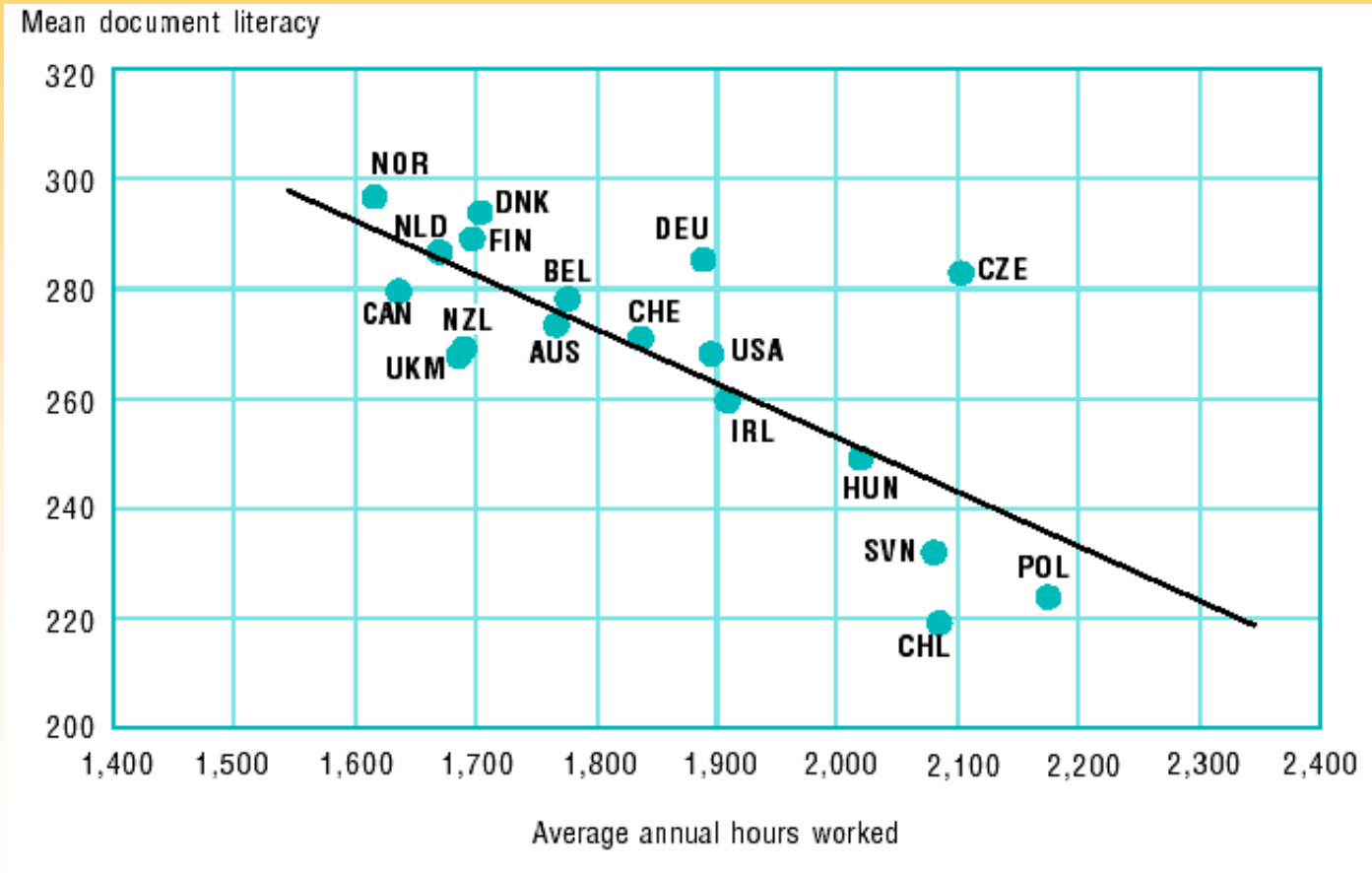


Adult Literacy and Lifeskills Survey

- Average skill levels explain over 55% of growth differences in GDP per capita 1960-1995
- If past relationship holds a 1% rise in average literacy will precipitate a 1.5% permanent increase in GDP per capita and a 2.5% increase in labour productivity
- Differences in the % at level 4 and 5 do not translate into growth differences
- Differences in the % at level 1 appear to retard growth and result in large differences. Low skill seem to inhibit rates of technical innovation and rate of adoption of more productive work organization
- The skill level of women seems to have had a larger impact on growth

Labour Volume by Document Literacy

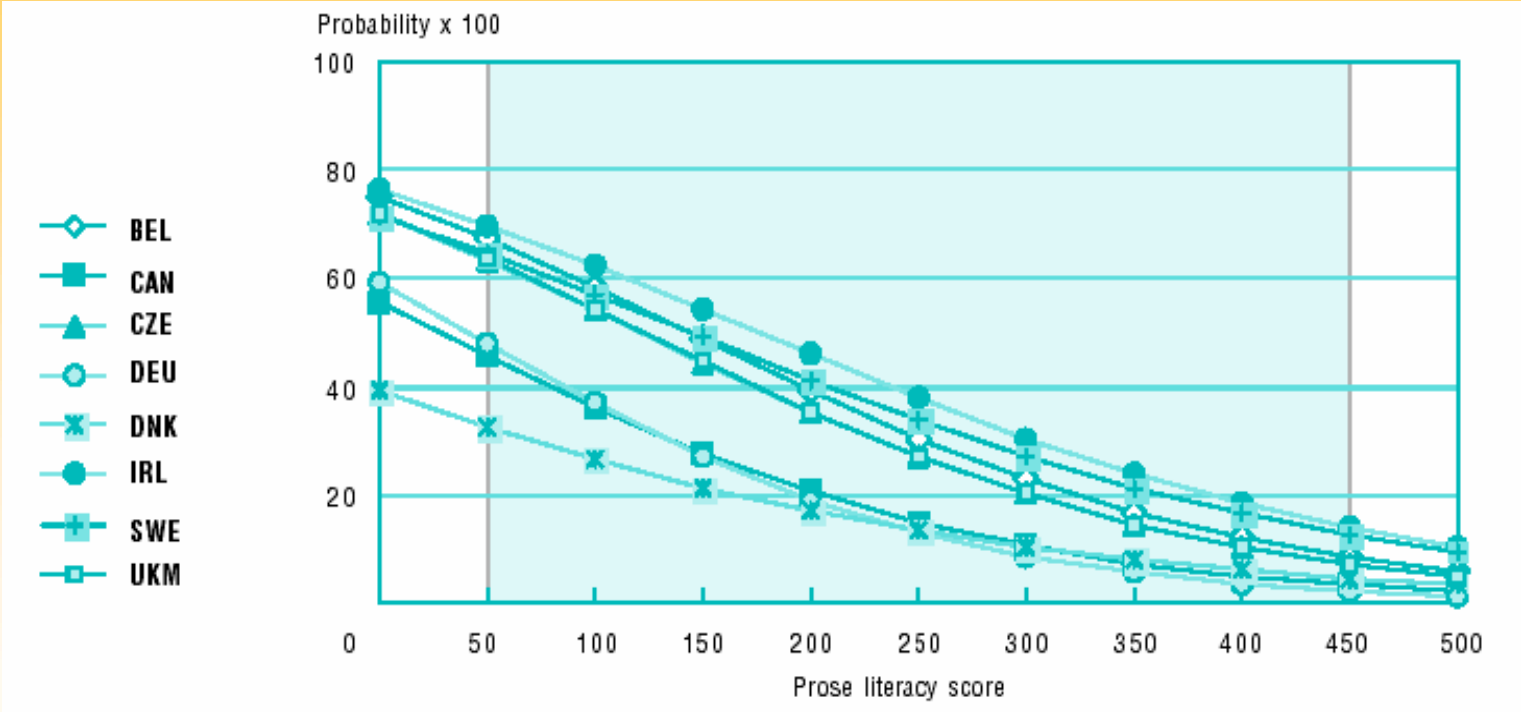
Average annual hours worked per person in employment and mean literacy proficiency, document scale, population aged 16-65,1994-1998



Source: **International Adult Literacy Survey, 1994-1998.**

At the individual level skill exerts a strong influence on the probability of experiencing unemployment

Probability of being unemployed according to prose literacy score, for men aged 16-25 with less than upper secondary education, 1994-1998



Probability of unemployment and literacy proficiency

Note: Probability values in blue-shaded ranges are based on observed scale scores with sufficient effective sample sizes.

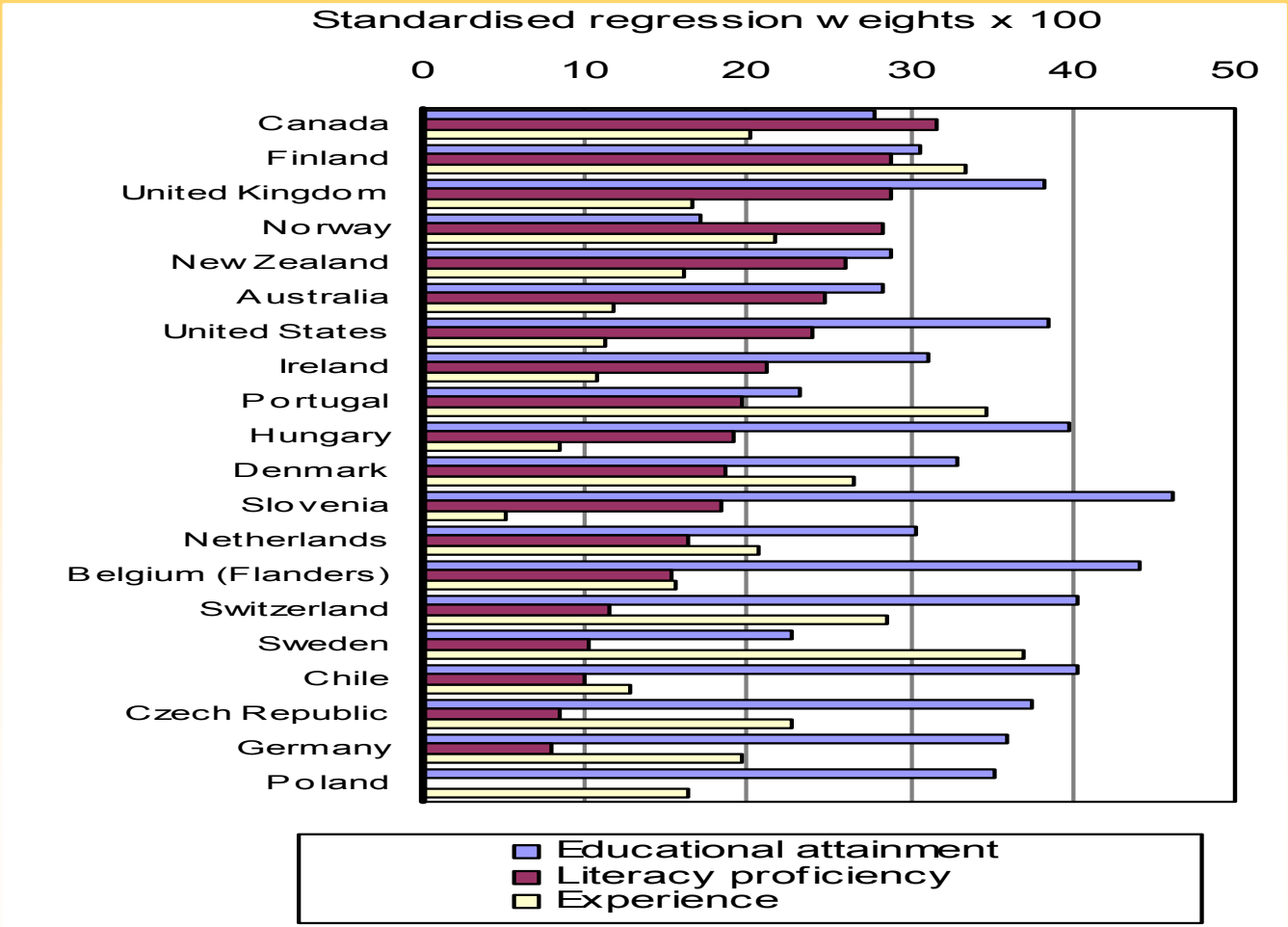
Source: International Adult Literacy Survey, 1994-1998.

Adult Literacy and Lifeskills Survey

… and explains a significant fraction of wage variability in Canada, but not in Sweden…

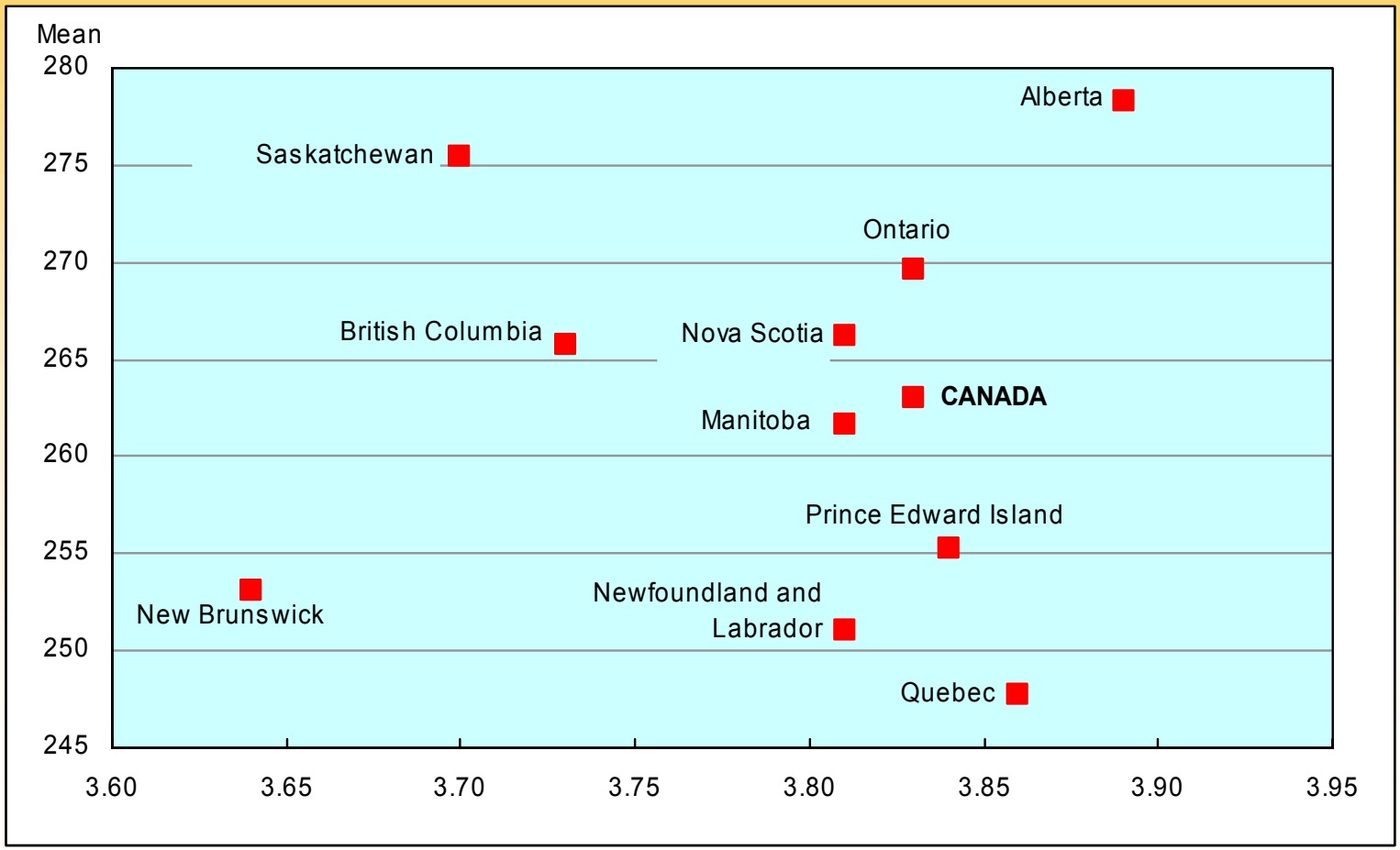
Earnings and literacy proficiency, controlling for education and labour force experience

Countries are ranked by the magnitude of the effect parameter associated with educational attainment.



Source: International Adult Literacy Survey, 1994-1998.

Mean Health Literacy Scores on a Scale with Range 1-500 Points, by Perceived Health Status by Province



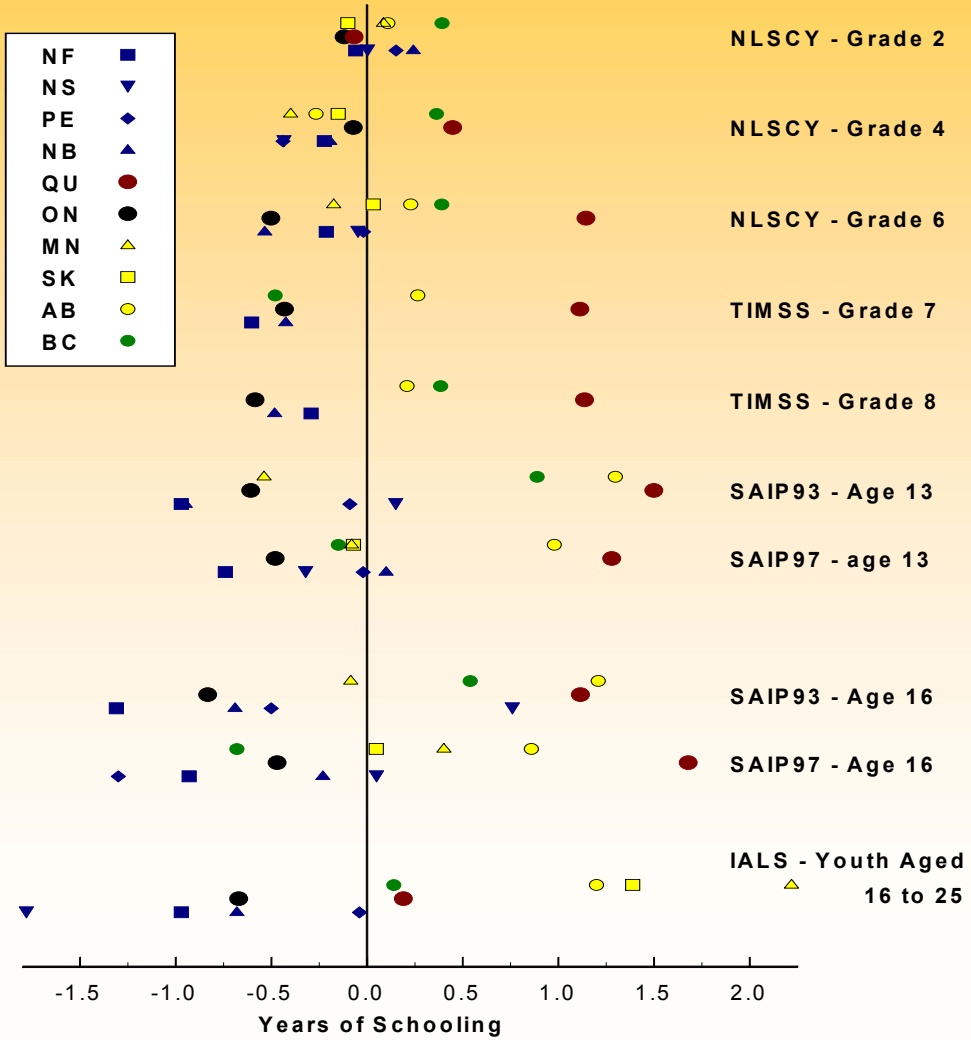
Source: 1994 International Adult Literacy Survey, Canada.

A reconciliation of PISA and IALS scales: Percentile distributions and Levels

The structure and content of education systems has a significant impact on the relative quality of the skill flowing out of the K-12 system

Provincial Differences in Mathematics Scores

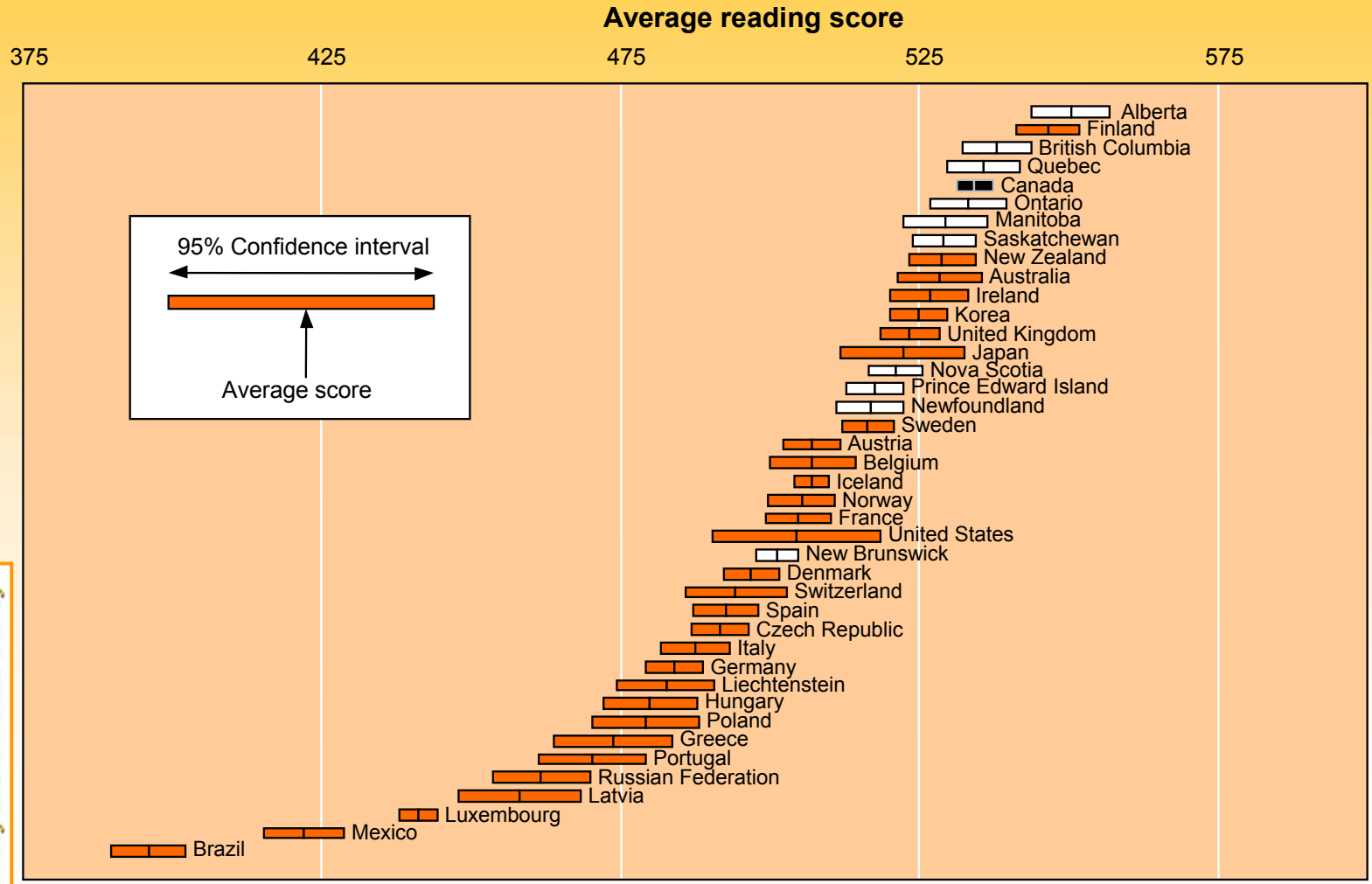
Figure 16-1. Inter-Provinicial Differences in Mathematics Scores



Source: Vulnerable Children, J. D. Willms, UNB

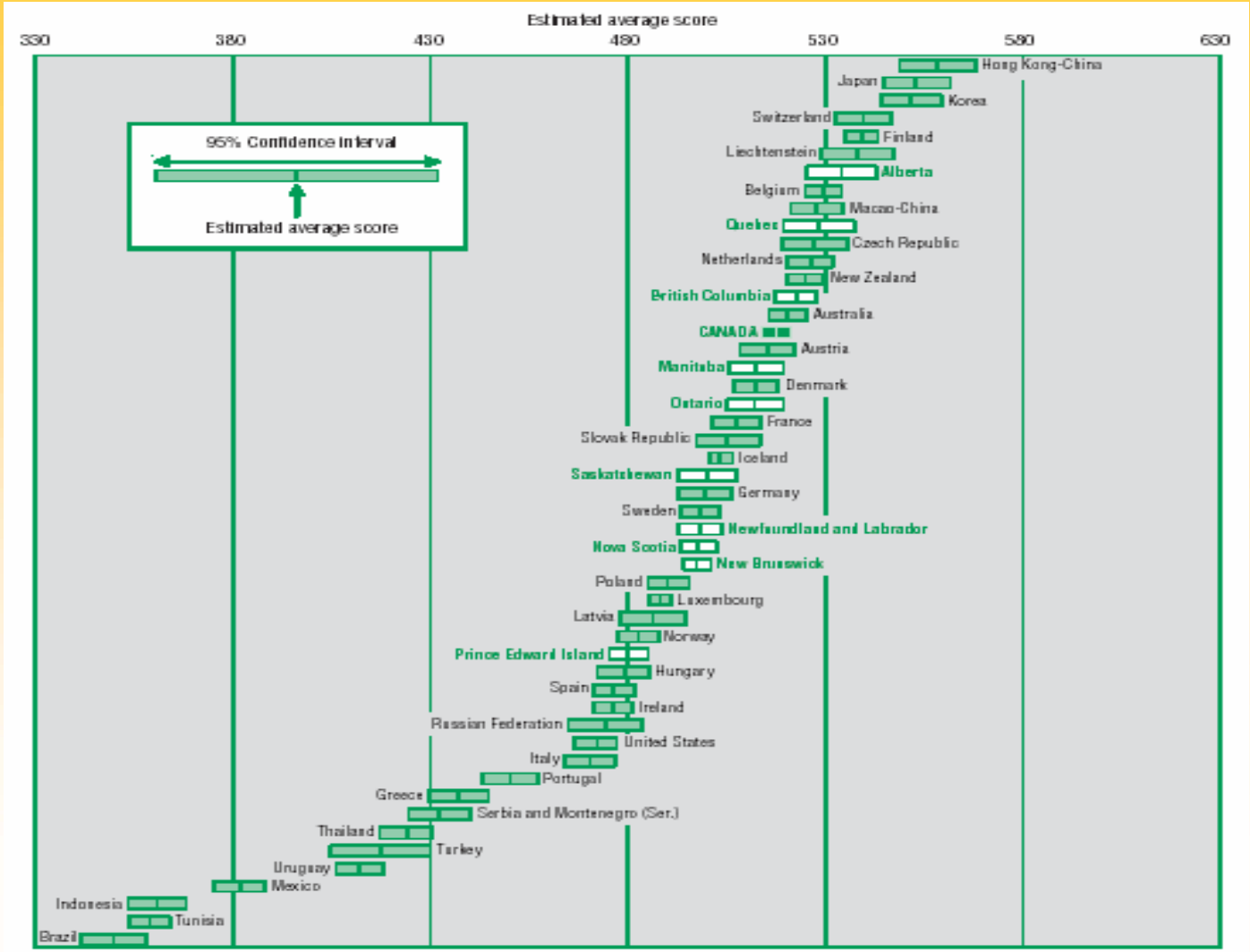
Adult Literacy and Lifeskills Survey

… thus, one observes large difference in quality at age 15 across provinces
Canada rates near the top of the world in READING literacy



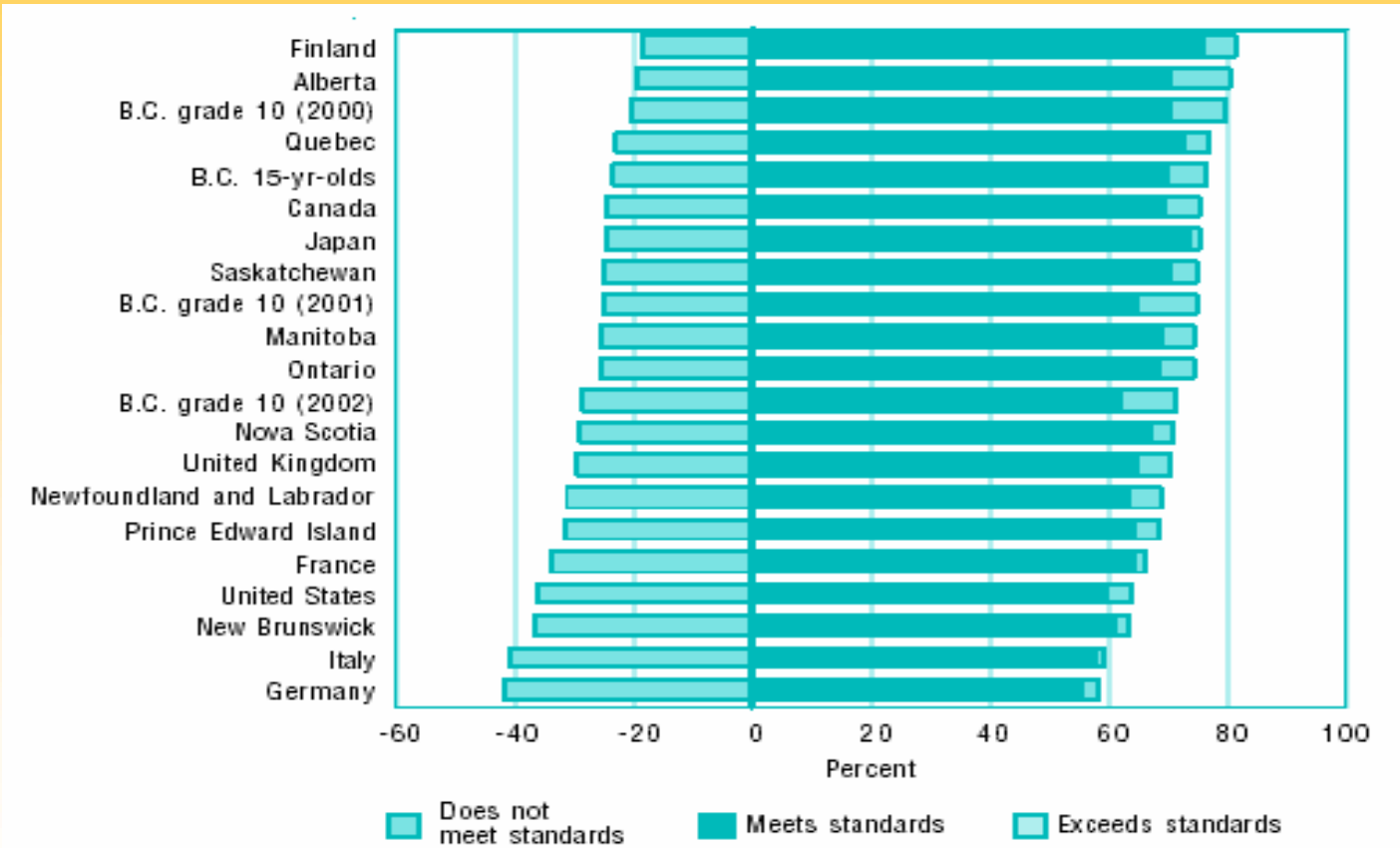
Source: Programme for International Student Assessment, 2000.

Estimated average scores and confidence intervals for provinces and countries: Combined Mathematics



Note: The OECD average is 500 with a standard error of 0.6.

Significant proportions of 15 year olds fail to meet B.C.'s grade 10 performance standards…
Percentage of 15-yr olds from various jurisdictions attaining B.C. grade 10 reading standards, 2000

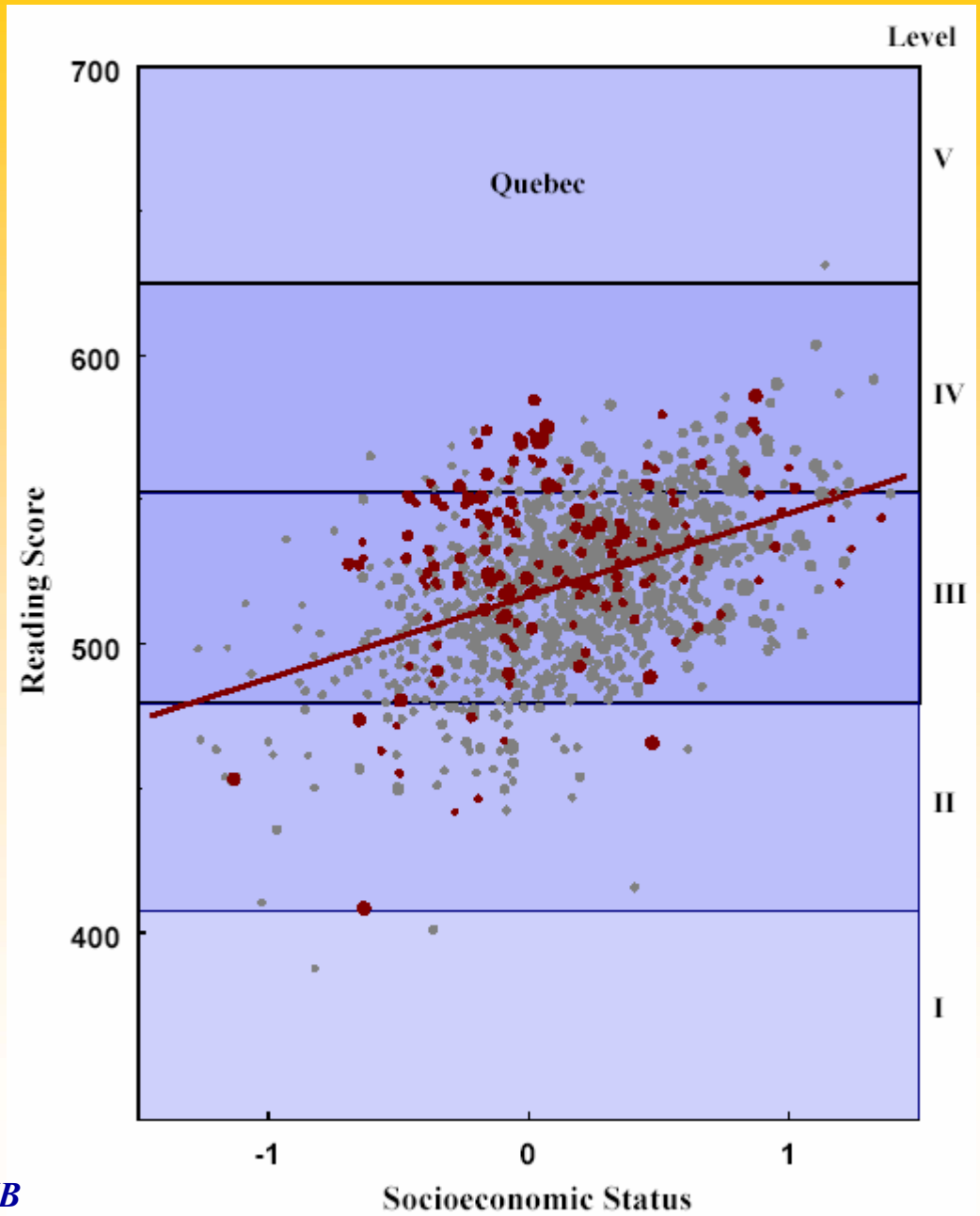


1. All results shown here are for 15-year-olds except for B.C. grade 10 students who are, on average, 6 months older than B.C. 15 year olds.
Jurisdictions ordered by the percentage of students meeting or exceeding expectations.
Source: Table 6

Adult Literacy and Lifeskills Survey

School Profile for Quebec

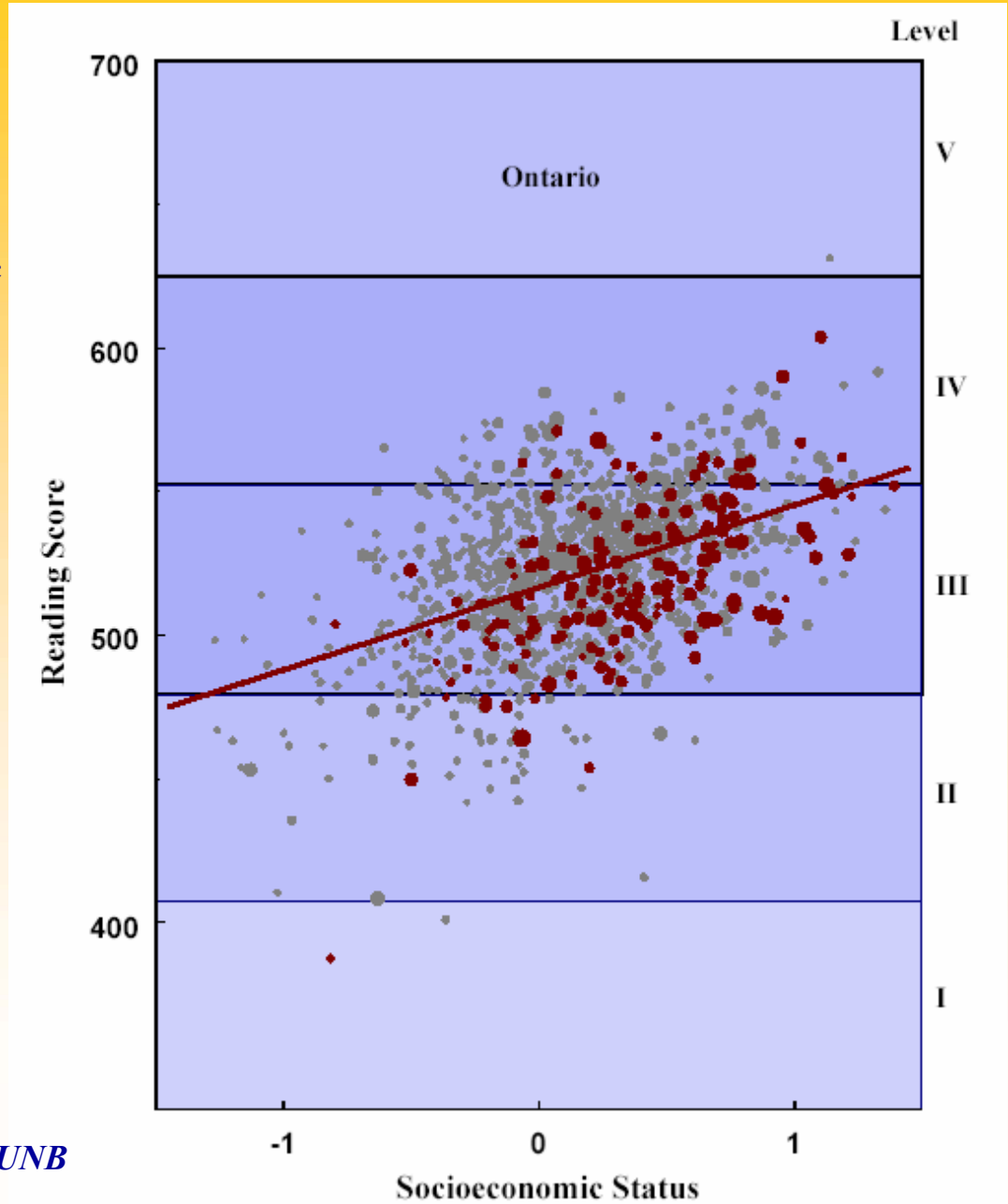
The profile for Quebec shows that the high average level of reading performance achieved by Quebec students is not attributable to students in a few elite schools. Instead, Quebec's success rests with it outstanding performance among schools serving students of average SES. There are a few schools of very low SES, and these tend to have relatively low school performance.



Source: J. D. Willms, UNB

School Profile for Ontario

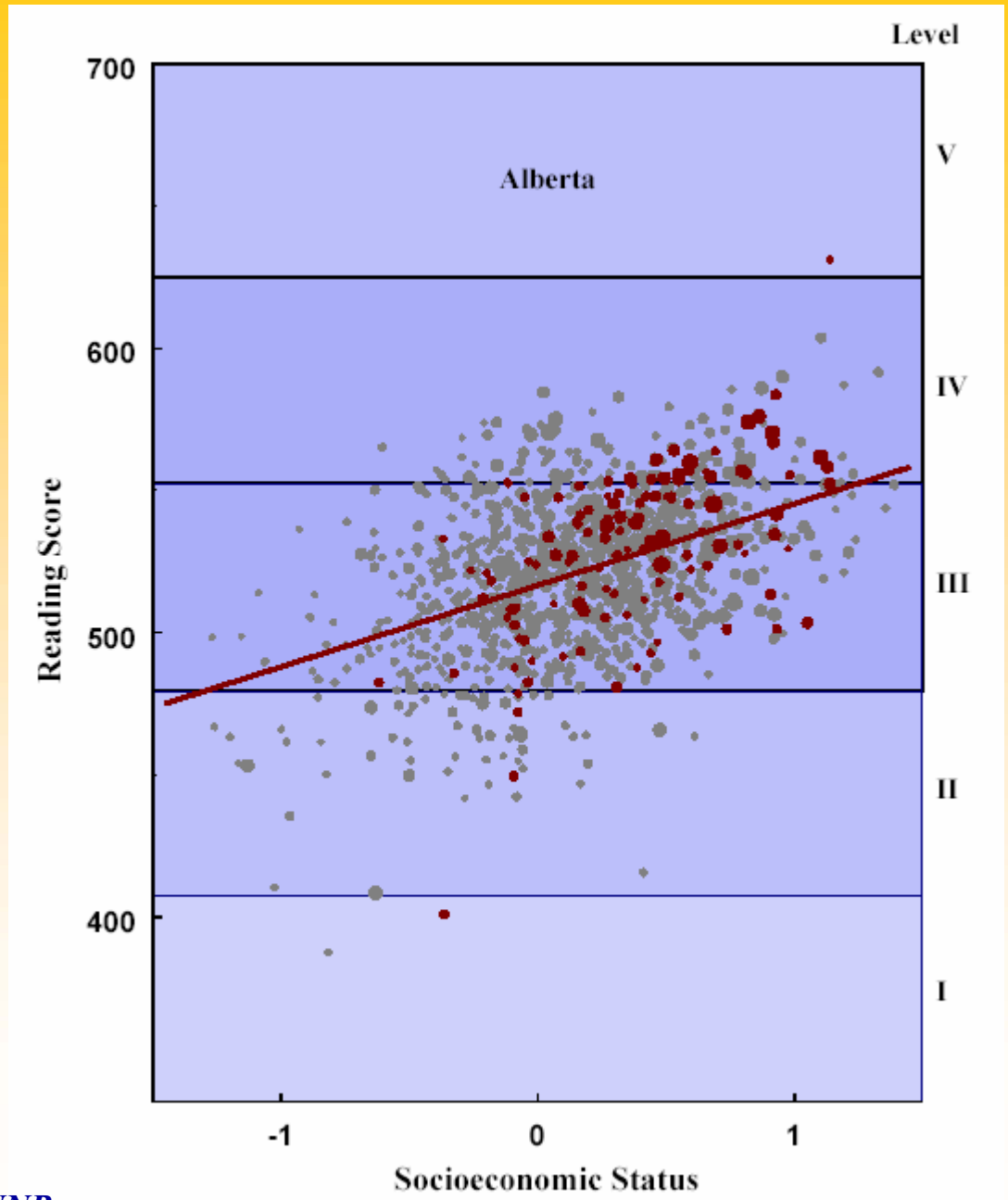
The analysis of socioeconomic gradients (Figure 3) indicated that Ontario students scored well below their counterparts in Quebec and Alberta, across the full range of SES. The school profile above shows that the SES intake of most schools in Ontario is above the OECD mean. However, the majority of Ontario's schools scored below the regression line, indicating that they were not performing as well as other Canadian schools with comparable student intake. Thus, Ontario's relatively low overall performance is not attributable to a few low SES schools with low performance. Rather, it is associated with a more general pattern of slightly lower than expected performance among the majority of its schools.



Source: J. D. Willms, UNB

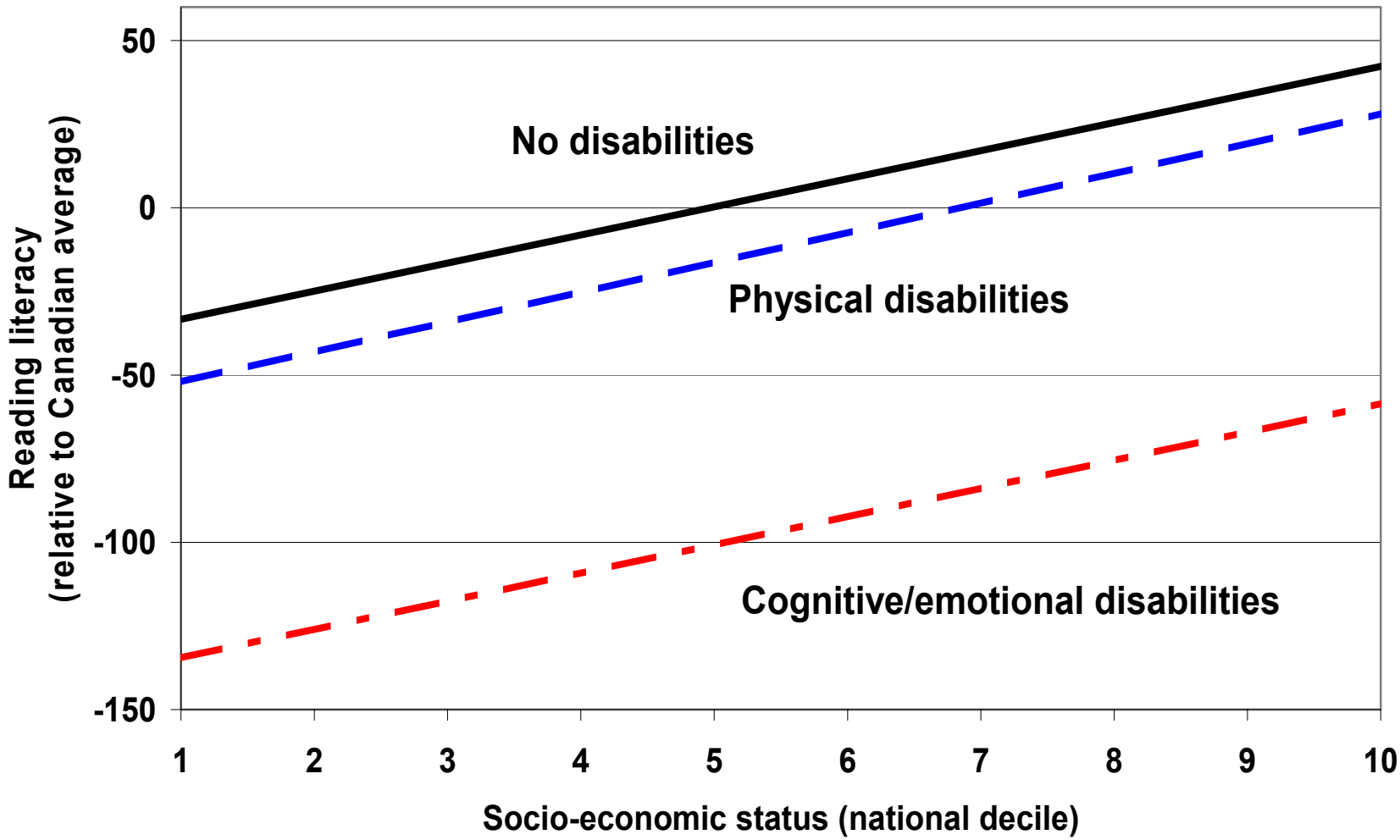
School Profile for Alberta

The relatively high performance of Alberta students is partially owing to its relatively high level of SES. The results in Tables 1 and 2 indicated that its mean score after adjusting for SES was about 535, similar to the Canadian average. This is reflected in its school profile as well. Most of the schools in Alberta serve a relatively advantaged population. Among these schools there are many that are performing well above norms, but there are others that have relatively low performance, given their SES intake.



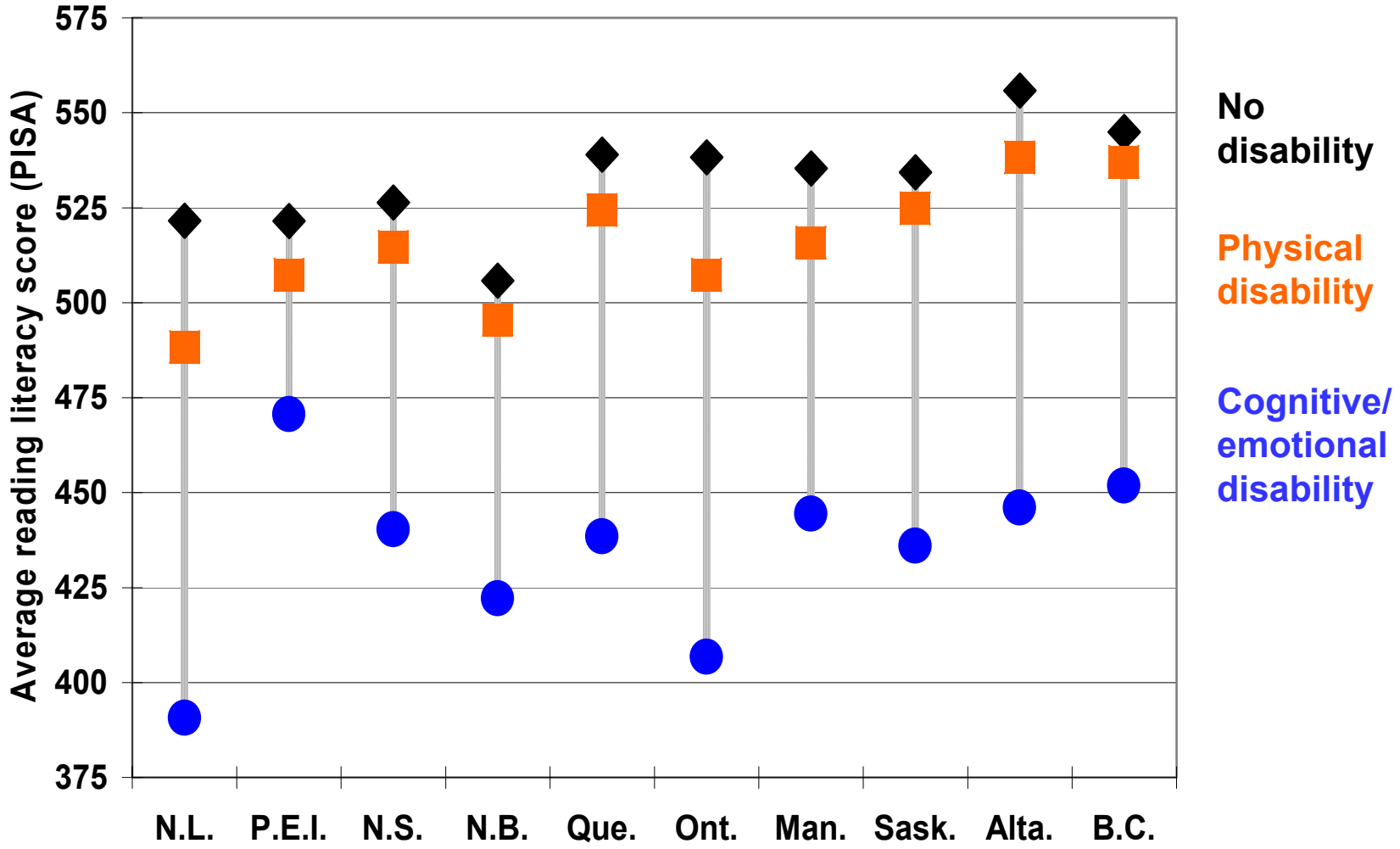
Source: J. D. Willms, UNB

Students with cognitive/emotional disabilities have much lower literacy than other students, even those from very high socio-economic backgrounds.



Source: YITS/PISA 2000

The literacy gap between disabled and non-disabled students varies across provinces, particularly for cognitively/emotionally disabled students

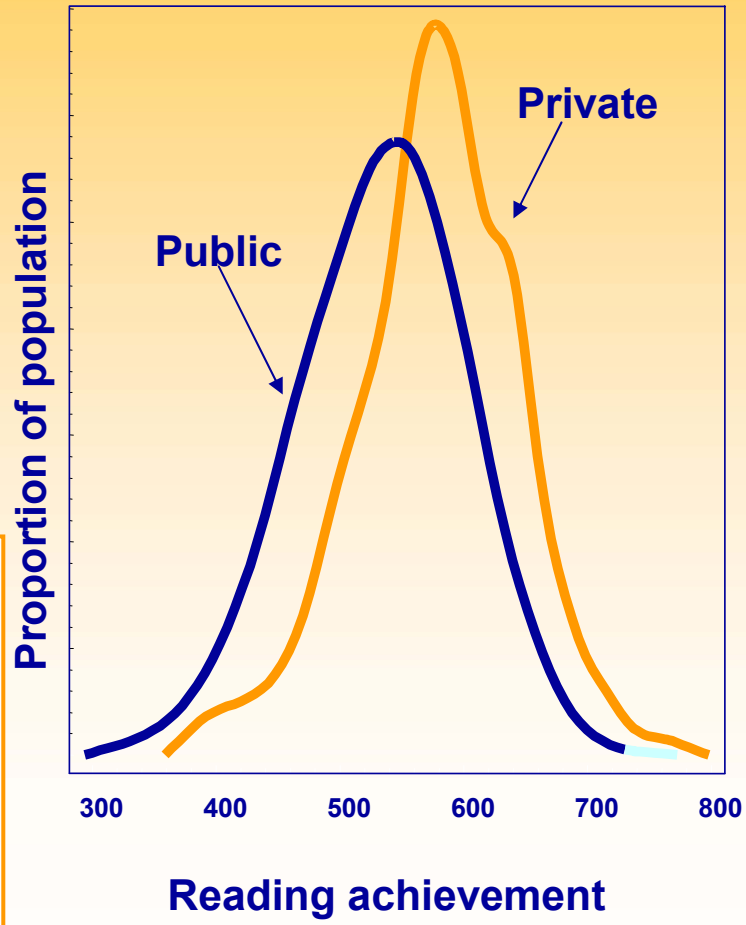


Source: YITS/PISA 2000

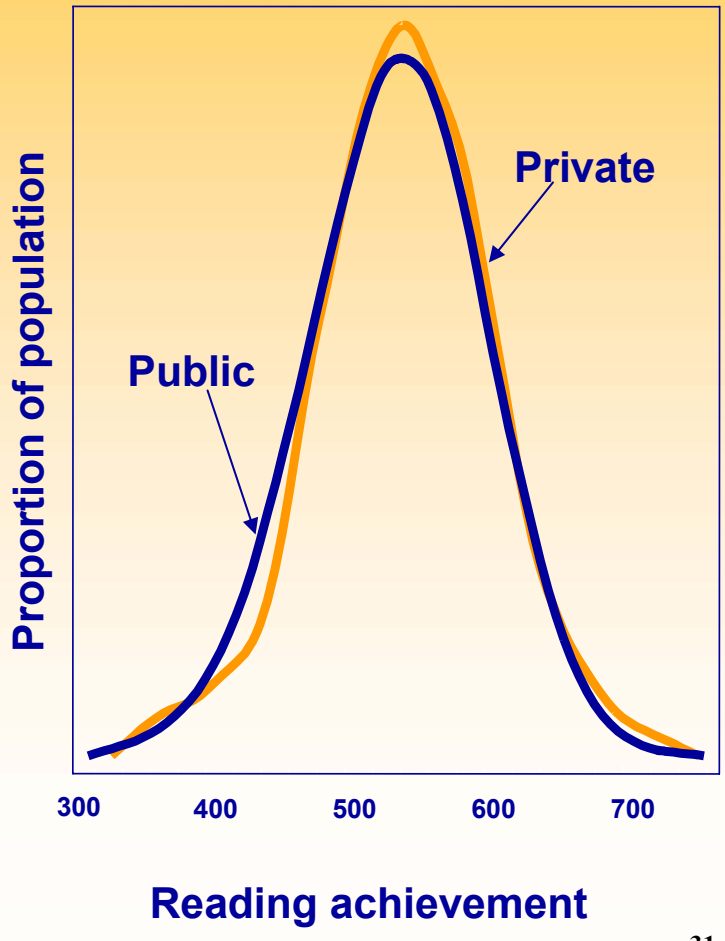
Summary of Relationships

All Predictors	Bivariate	After conditioning
Public vs. Private	Moderate	-
SES	Small	Small
Family Possessions	Small	Small
Disciplinary Climate	Small	-
Student Behaviour	Small	-
Negative Teacher Behaviour	Small	-
Teacher Support	-	-
Teacher-student Relations	-	-
Teacher Shortage	-	-
Teacher Morale	-	-
Inadequacy of Instructional resources	-	-
Inadequacy of Material resources	-	-

The apparent private school advantage



After controlling for parental SES-private school advantage disappears



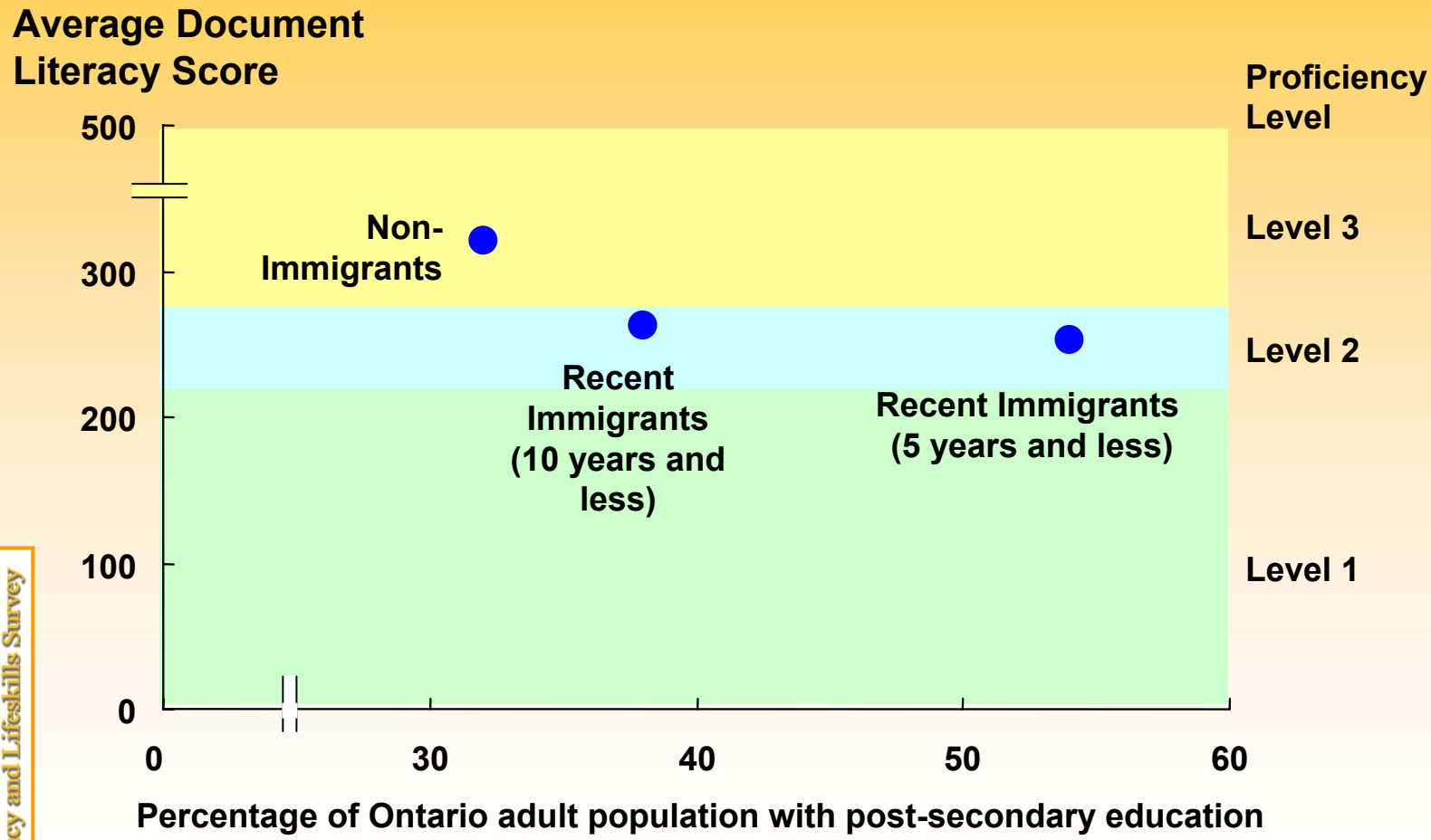
Literacy and numeracy have a marked impact on the probability of going on the PSE…

Effects on PSE attendance associated with youth's age, sex, parental education, and literacy scores: International Adult Literacy Study, 1994

	Odds Ratio
Age of respondent (years)	1.46
Respondent is female	1.81
At least one parent completed university	1.81
Prose Literacy Score at Levels 1 or 2	0.09
Prose literacy Score at Level 3	0.45
Prose literacy Score at Level 5	2.20
Respondent's quantitative literacy score is high relative to his or her prose literacy score	1.45

Source: J. D. Willms, UNB

Average Document Literacy Score by Proportion of population with post-secondary credentials



Source: 1994 International Adult Literacy Survey and 1998 Ontario Immigrant Literacy Survey.

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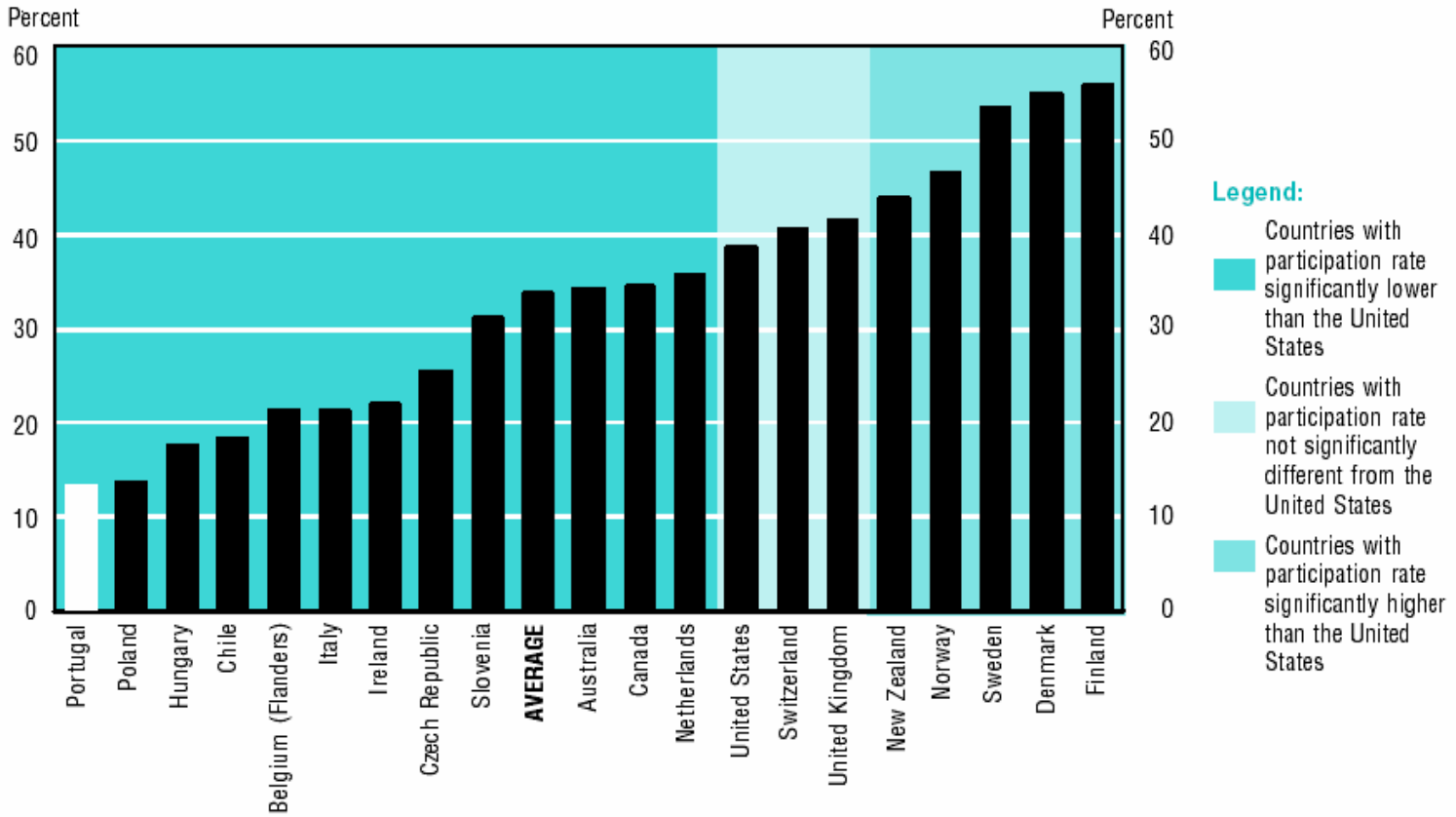
Figure 9

Participation in adult education and training

Rate of participation in adult education and training, population aged 25-65, 1994-1998



Countries are ranked by the rate of participation.

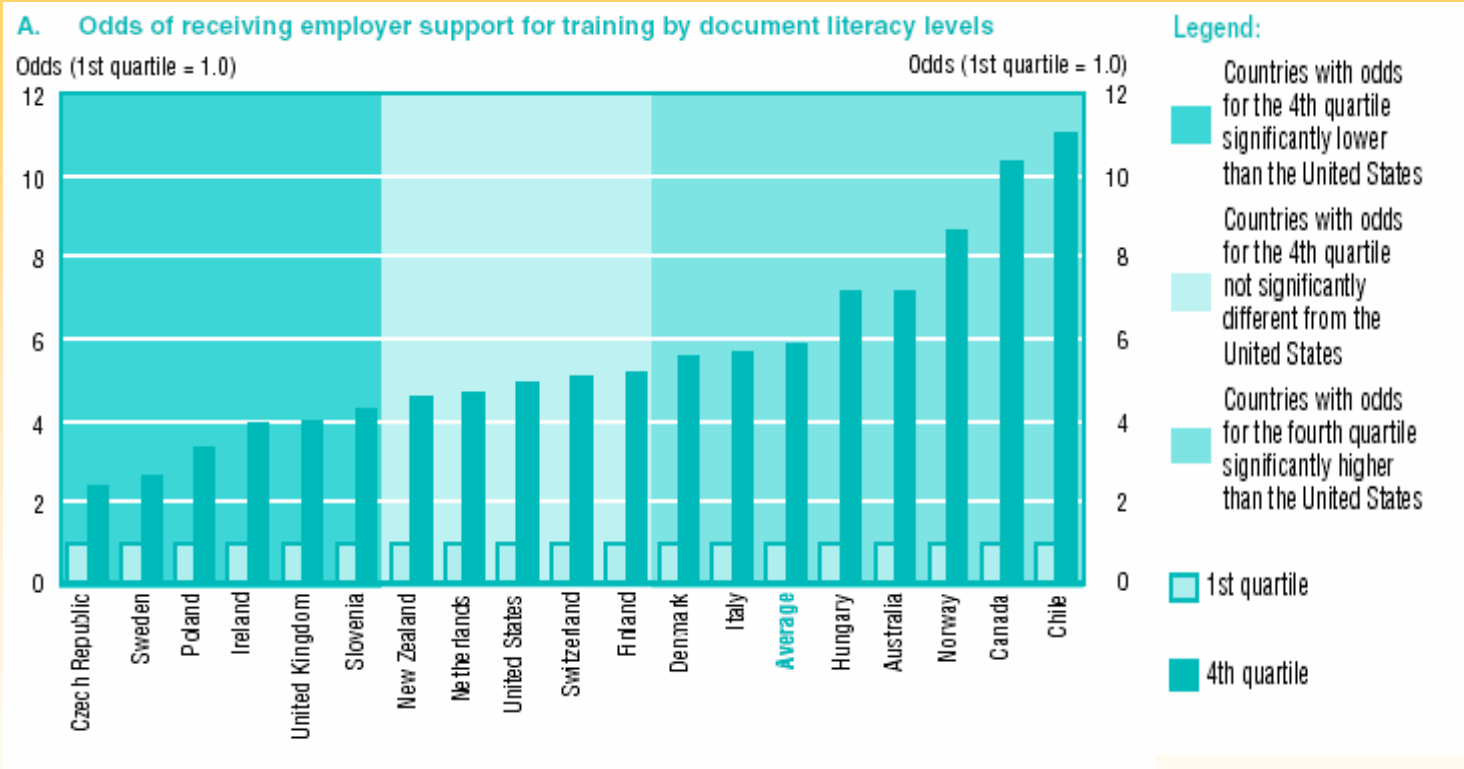
Note: Statistical difference is significant at $p < .05$.

Source: International Adult Literacy Survey, 1994-1998.

… but allocates employer sponsored training to the high skilled

Likelihood of receiving employer support for training

Odds of participating in employer-sponsored adult education and training, by document literacy levels, population aged 25-65, 1994-1998



Countries are ranked by the odds of the 4th quartile. The statistical difference to the United States is computed for the 4th quartile.

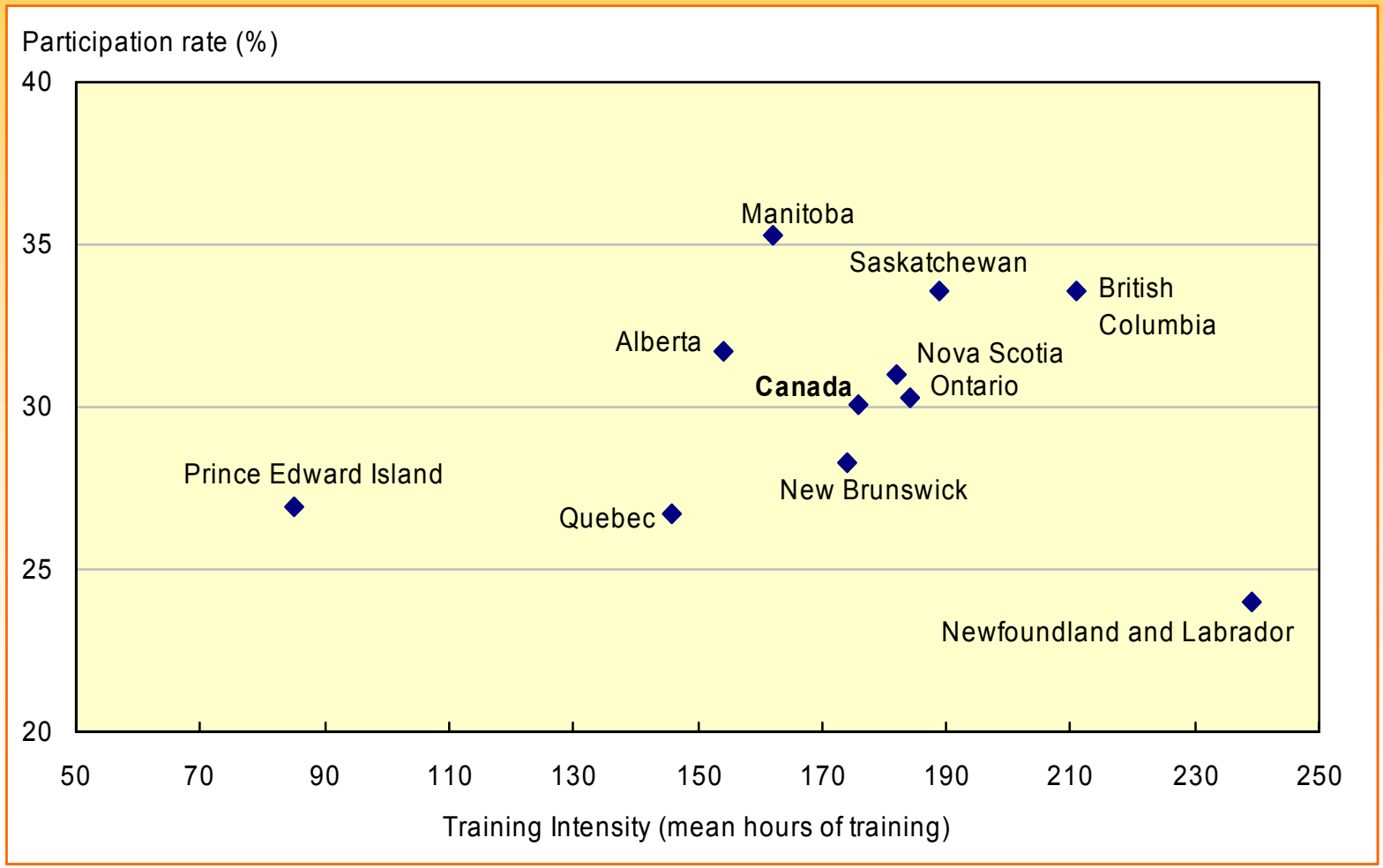
Note: Statistical difference is significant at $p < .05$.

Source: International Adult Literacy Survey, 1994-1998.

Adult Education Participation in North America: International Perspectives.

Additions to Skills through Adult Education and Training

Incidence and Intensity of Job-related Training, population aged 25 to 64, 2002[1]



1 Incidence is measured as proportion of population aged 25 to 64 with job-related training in 2002. Intensity is measured in mean hours of training per participant.

The Adult Literacy and Life Skills Survey (ALL)

- Updated skill profiles for prose and document literacy
- Improved skill profile for numeracy
- New skill profile for problem solving and health literacy
- Indirect measures of use of ICT's
- Participation in adult education and training

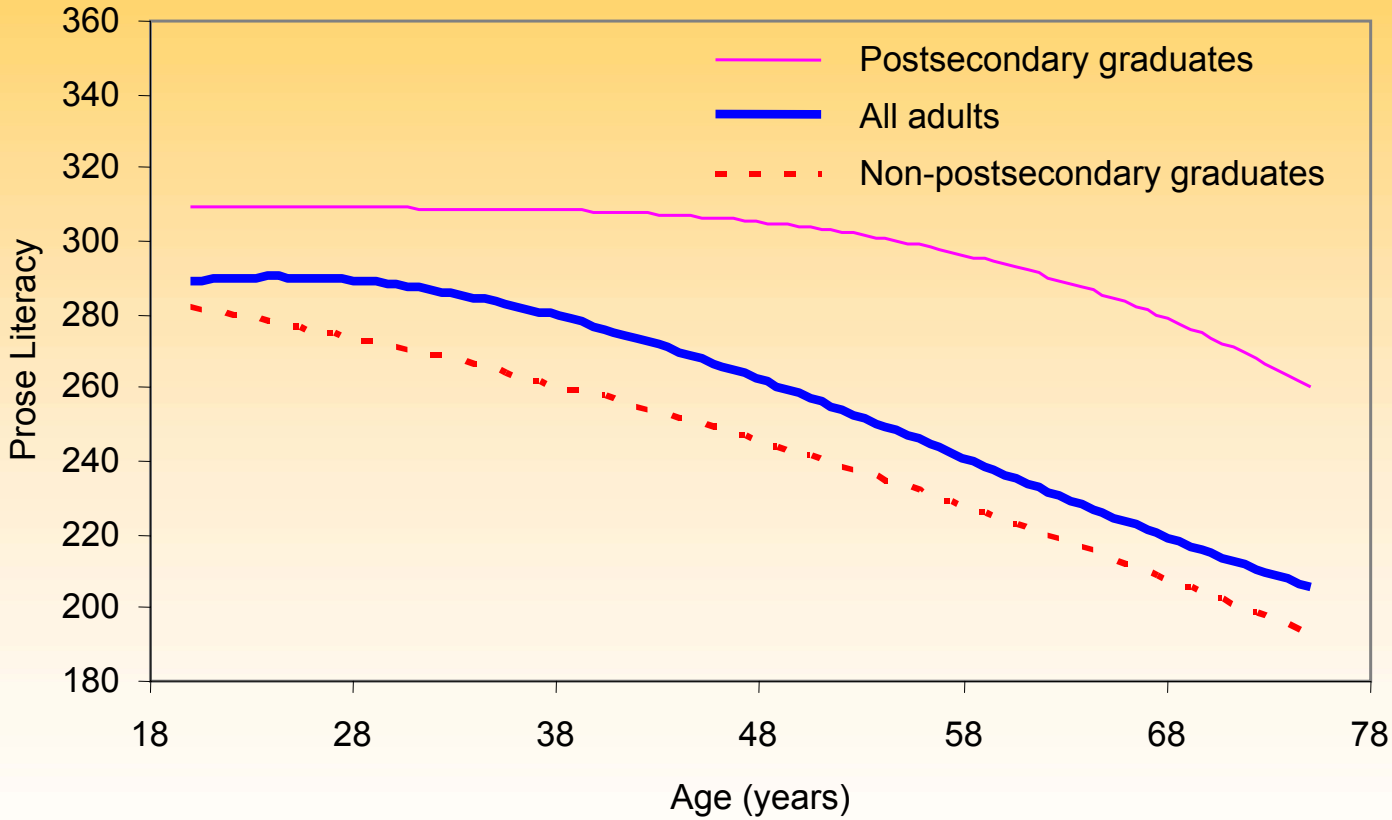
- **Indices of skill use on the job and at home**
- **Self assessment of skill**
- **Labour market, educational social and health outcomes**

Key Policy questions:

- **How rapidly are adult skill profiles evolving? What is driving skill gain and loss?**
- **How do ICT's interact with skill and labour market outcomes?**
- **What is the relationship between physical and mental health and skill level?**
- **See www.ets.org/ALL**

Skill loss or improving educational quality?

Prose Literacy by Age: Canada



Policy summary for Czech Republic

- Czech Republic has to invest in learning and skills development
- The cost of inaction is high
- These investments will pay for themselves through increased tax revenue and reduced public expenditures
- EU integration offers great opportunity

Policy Prescription for Czech Republic: Children

WHAT –	**Improve the quality of current education output.**
HOW –	**By reducing the percentage of students graduating with low skills.**
HOW –	**By increasing in-service training to transfer best practice;**
	Reading specialists as resources persons;
	Pre-service training in best practice.
INPUTS –	**Money, expertise and analysis**

Policy Prescription for Czech Republic: Adult

WHAT –	Improve the level of adult skills by reducing percent at levels 1 and 2
HOW -	By using a combination of workplace and community – based training including incentives for firms
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