

# Education, Schooling and the Labour Market

A CERF Panel Discussion  
Carleton University  
T. Scott Murray  
Statistics Canada  
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Statistics  
Canada

Statistique  
Canada

# Definitions of human and social capital

Human capital: the knowledge skills, competences and other attributes embodied in individuals that are relevant to economic activity. (OECD)

Social capital: networks, norms and trust that allow social agents and institutions to be more effective in achieving common objectives. (Coleman)



# Who: Users of Empirical Data related to Skills and Learning

- General public in their role as citizens
- General public in their role as parents
- General public as learners
- Researchers
- Policy makers, senior officials, politicians
- The media
- Managers, administrators and advocates
- Teachers and related professionals



# Why: Uses of empirical data related to skills and learning

1. Knowledge
2. Preparation for choice and action
3. Evaluation of choice and action
4. Routinization of choice and action



# Statistical Response: Measuring Lifelong Learning

- Learning is a lifelong process by which individuals acquire knowledge and skills that they use to adapt to the changing environment and for personal and societal benefit.
  - Lifewide
  - Lifelong
  - Reading to rocket science
  - Perceptions and behaviours



# Statistical Response (Cont'd)

- **Understanding Demand For Skills**
  - **Economic: Roles as Workers**
  - **Social: Roles as Citizens, Parents**



# Statistical Response (Cont'd)

- **Understanding Supply of Skills**
  - **Quantity:** Incidence, frequency, duration, completion
  - **Quality:**
- **Understand How Markets Work**
  - **Production Efficiency:** Quality assurance, standards
  - **Utilization:** Markets for skill  
**Mechanisms for allocating scarce resources/seats**
  - **Equity:**



# Lifewide: Learning Environments

- The family
- The community
- The school
- The workplace



# Lifelong: Key Stages

Birth

Childhood

Youth

Adult

Older Adult



Family

Schooling

Work

Parenting

Retirement



# What: Basic organizing framework

Inputs → processes → outputs/outcomes



# What: Characteristics of an ideal data system for skills and learning

- Wide
- Deep
- Individual
- Heirarchical
- Longitudinal
- Repeated
- Rooted
- Direct measures
- Accessible
- integratable



# Why: The level at which empirical data related to skills and learning will be applied:

1. The macro-level: systems (economies, provinces)
2. The meso level: institutions (schools, boards, families, workplaces, communities)
3. The micro-level: individuals



# What is the point

## What is:

- cross sectional point estimates
- cross sectional relationships: multivariate and multilevel  
“what factors amplify/attenuate”
- longitudinal relationships: multivariate and multilevel  
“to what extent are outcomes conditional”

**What might be:** • comparative analyses

**What should be:** • empirically informed debate



# Data Sources

Birth



- NLSCY** - *National Longitudinal Survey of Children and Youth*
- TIMSS** - *Third International Mathematics and Science Survey*
- YITS** - *Youth in Transition Survey*
- PISA** - *Program for International Student Assessment*
- SAEP** - *Survey of Approaches to Educational Planning*
- PEPS** - *Postsecondary Education Participation Survey*
- NGS** - *National Graduates Survey*
- AETS** - *Adult Education and Training Survey*
- IALS** - *International Adult Literacy Survey*
- ALL** - *International Adult Literacy and Lifeskills Survey*

Adulthood



# Ingredients for success

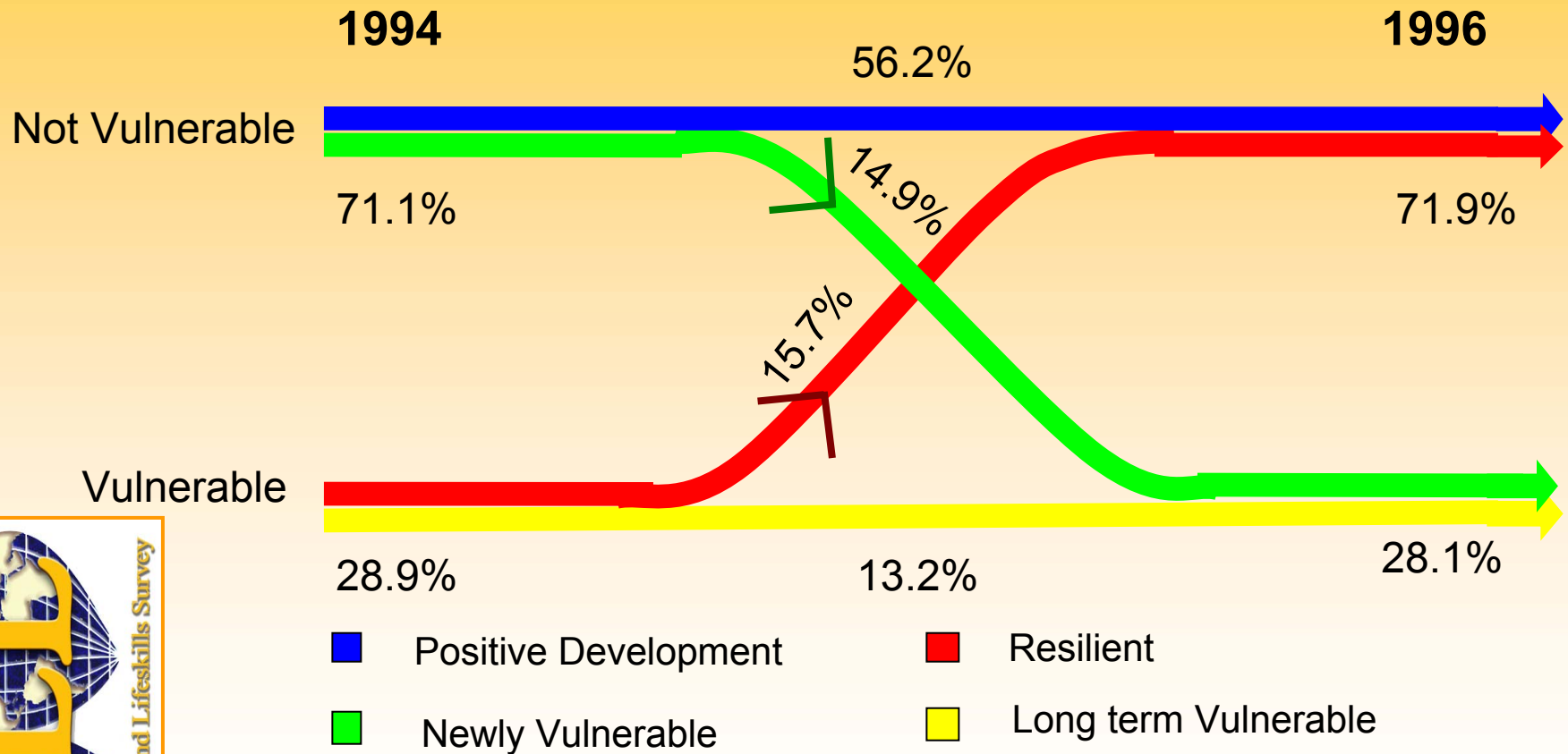
- Funding
- New vehicles
- New partnerships
- New products and services



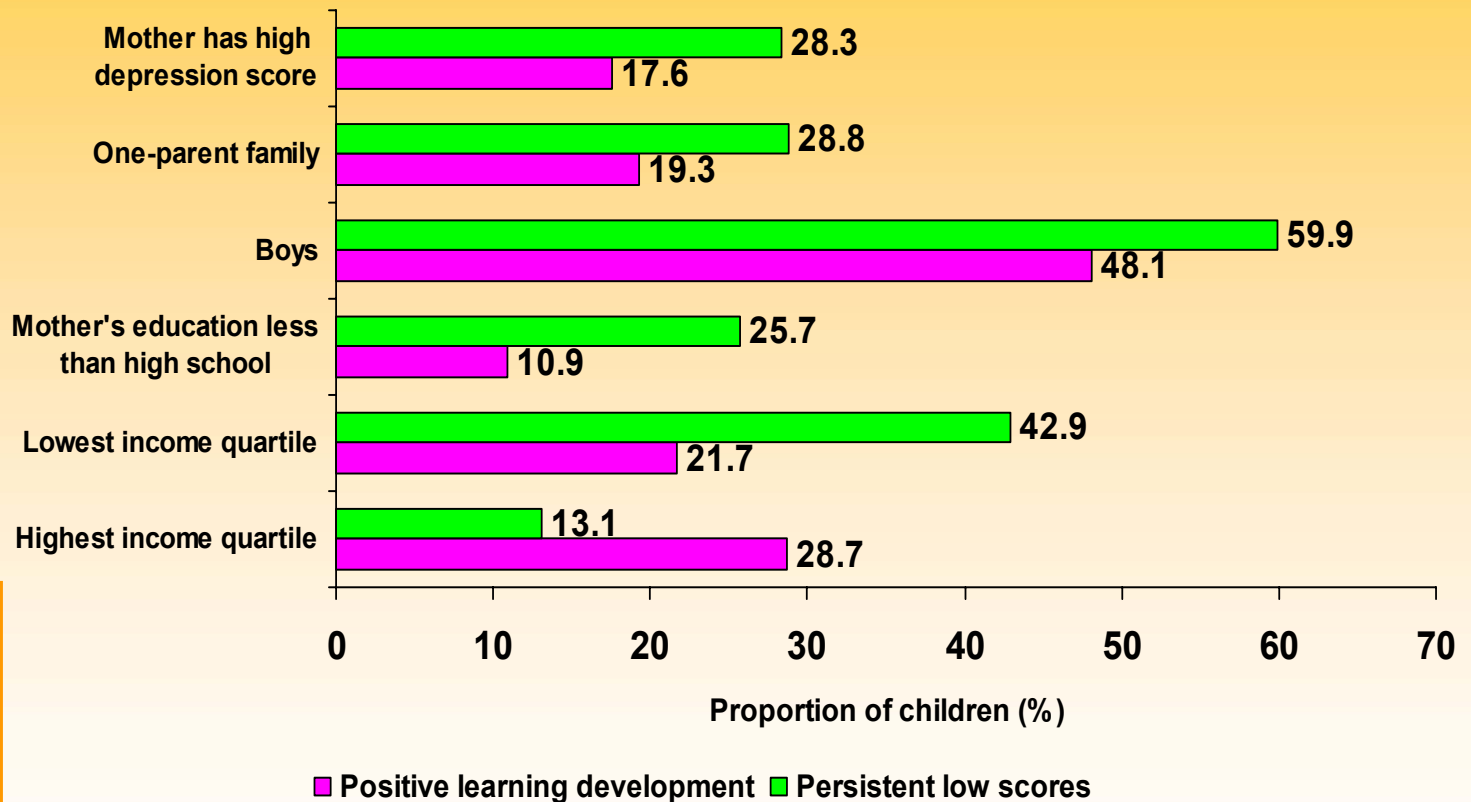
- **Patience** : Longitudinal data and trend data  
: Enough time to build trust and  
common purpose



# Vulnerability Is Not a Permanent State for Most Children



# Children with persistent low learning scores have characteristics associated with disadvantage

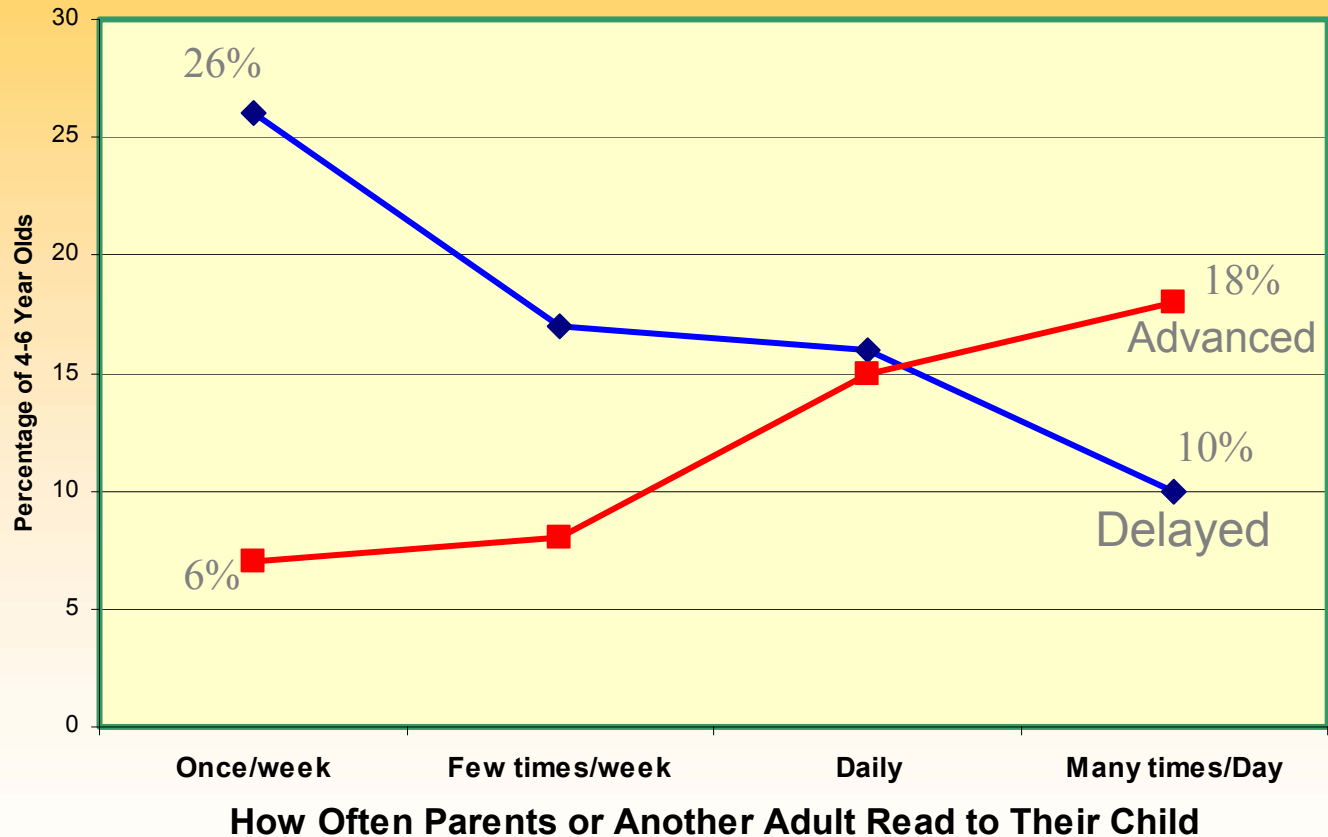


Source : NLSCY, 1994-1995, 1996-1997, 1998-1999



# Children Who are Read to More Often Have Advanced Scores on the PPVT

Does Reading to Your Child Help them Score higher on the PPVT?

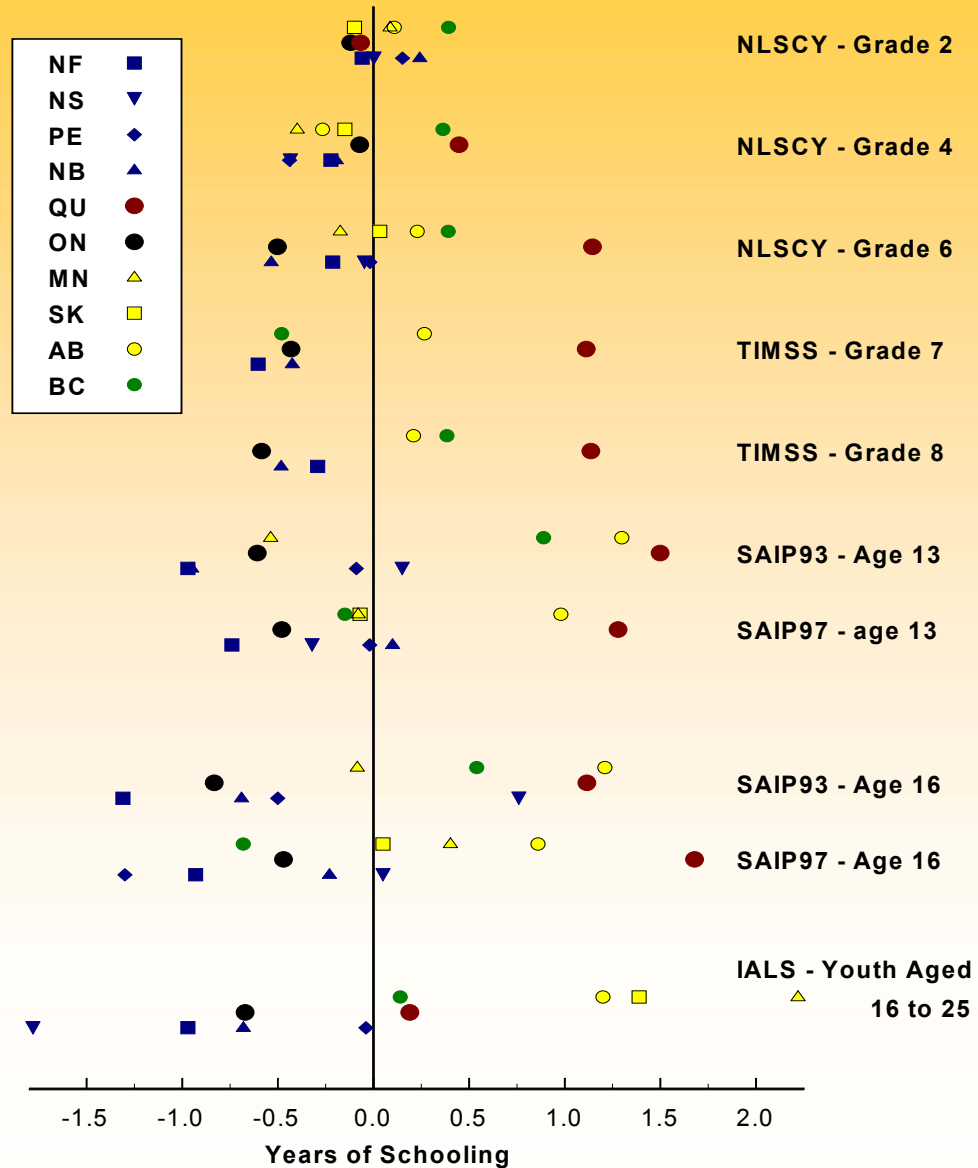


X<sup>2</sup> analysis - p < .001  
NLSCY cycle 3 data, 4-6 year olds  
Score of 0-85 + delayed, 115- 160 = advanced



# Provincial Differences in Mathematics Scores

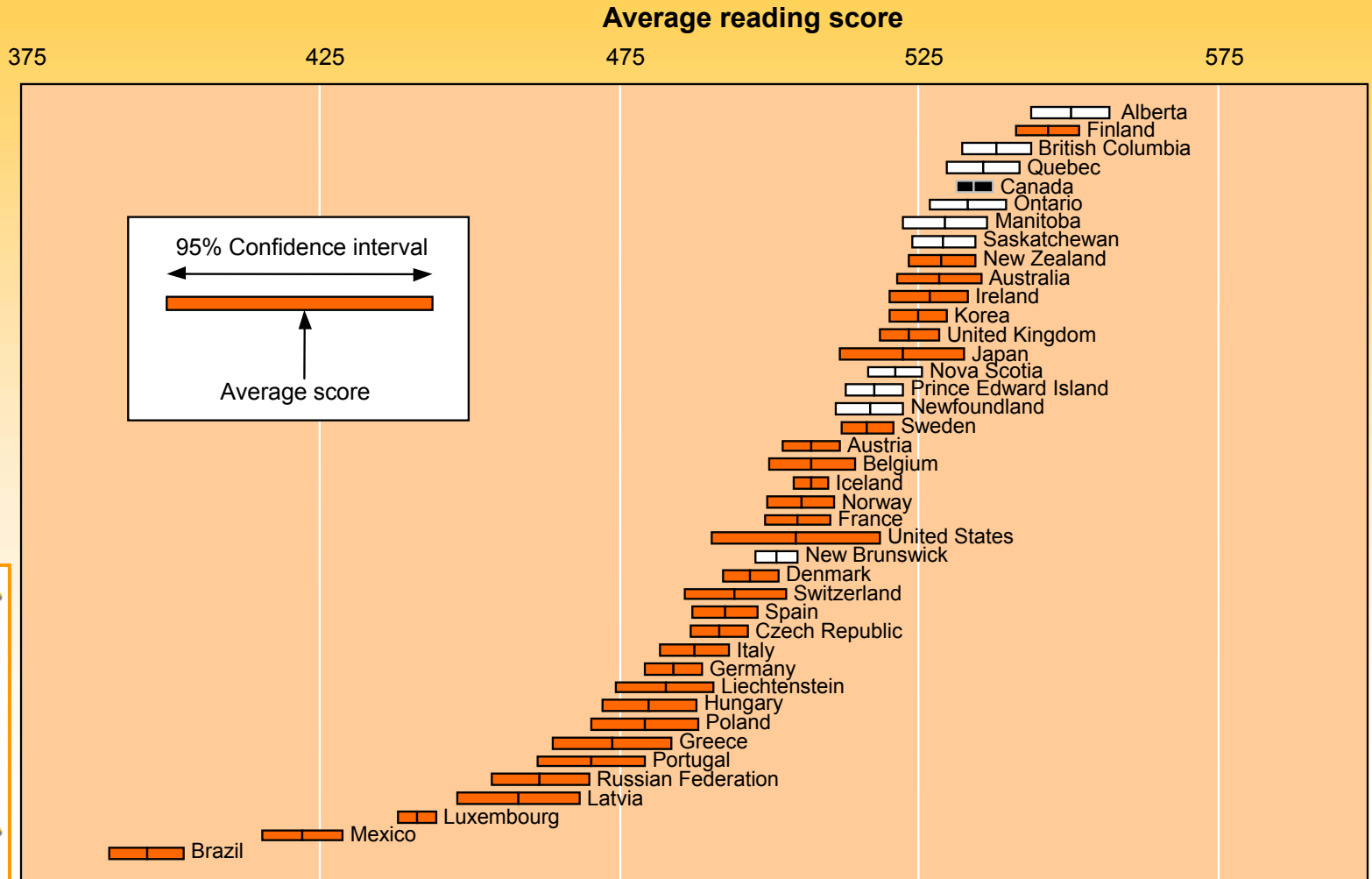
Figure 16-1. Inter-Provincial Differences in Mathematics Scores



Source: *Vulnerable Children*,  
J. D. Wilms, UNB



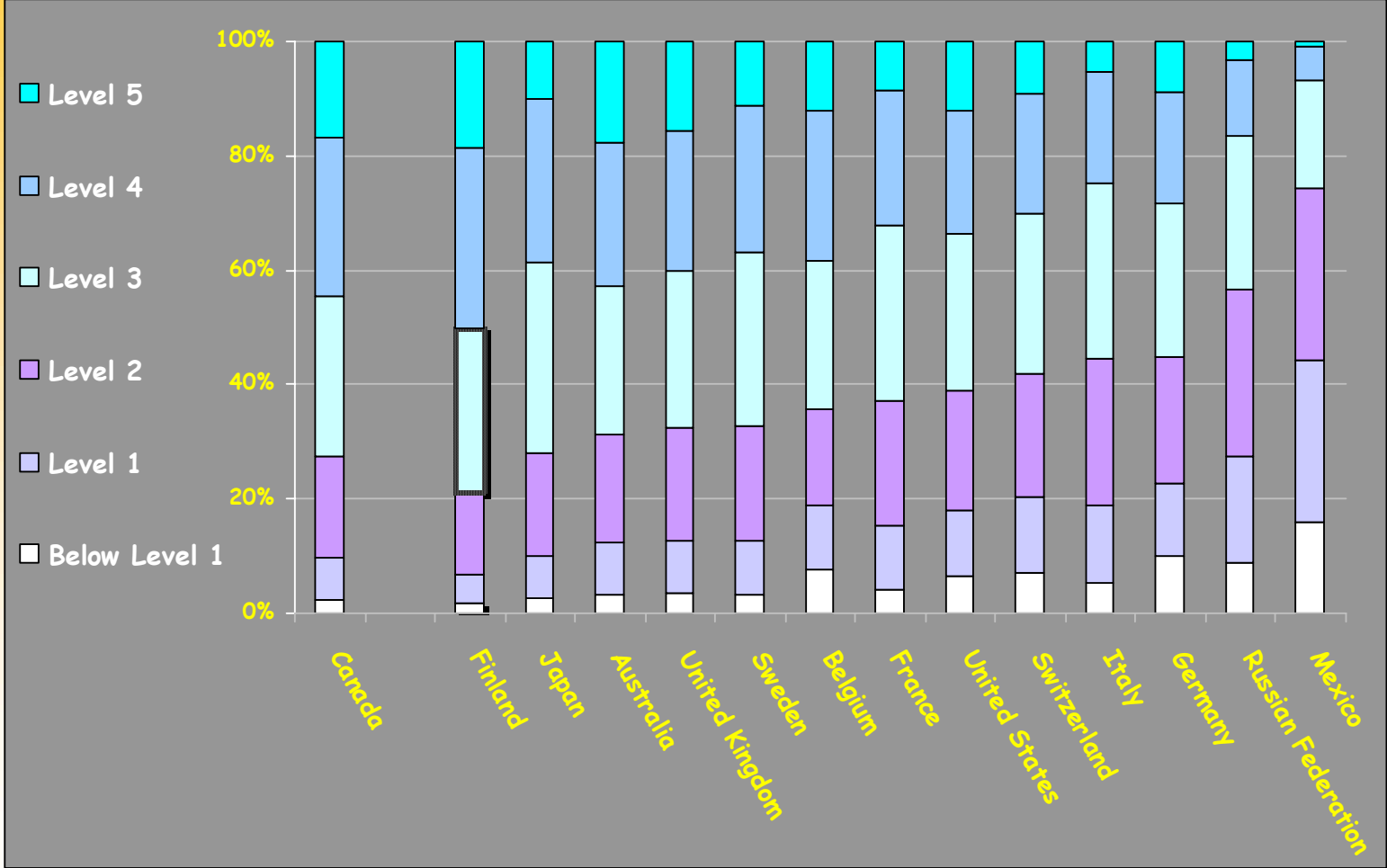
# Canada rates near the top of the world in **READING** literacy



Source: Programme for International Student Assessment, 2000.



# 17% of Canadian 15-year-olds are at level 5 Reading performance and less than 10% are at or below Level 1-- PISA

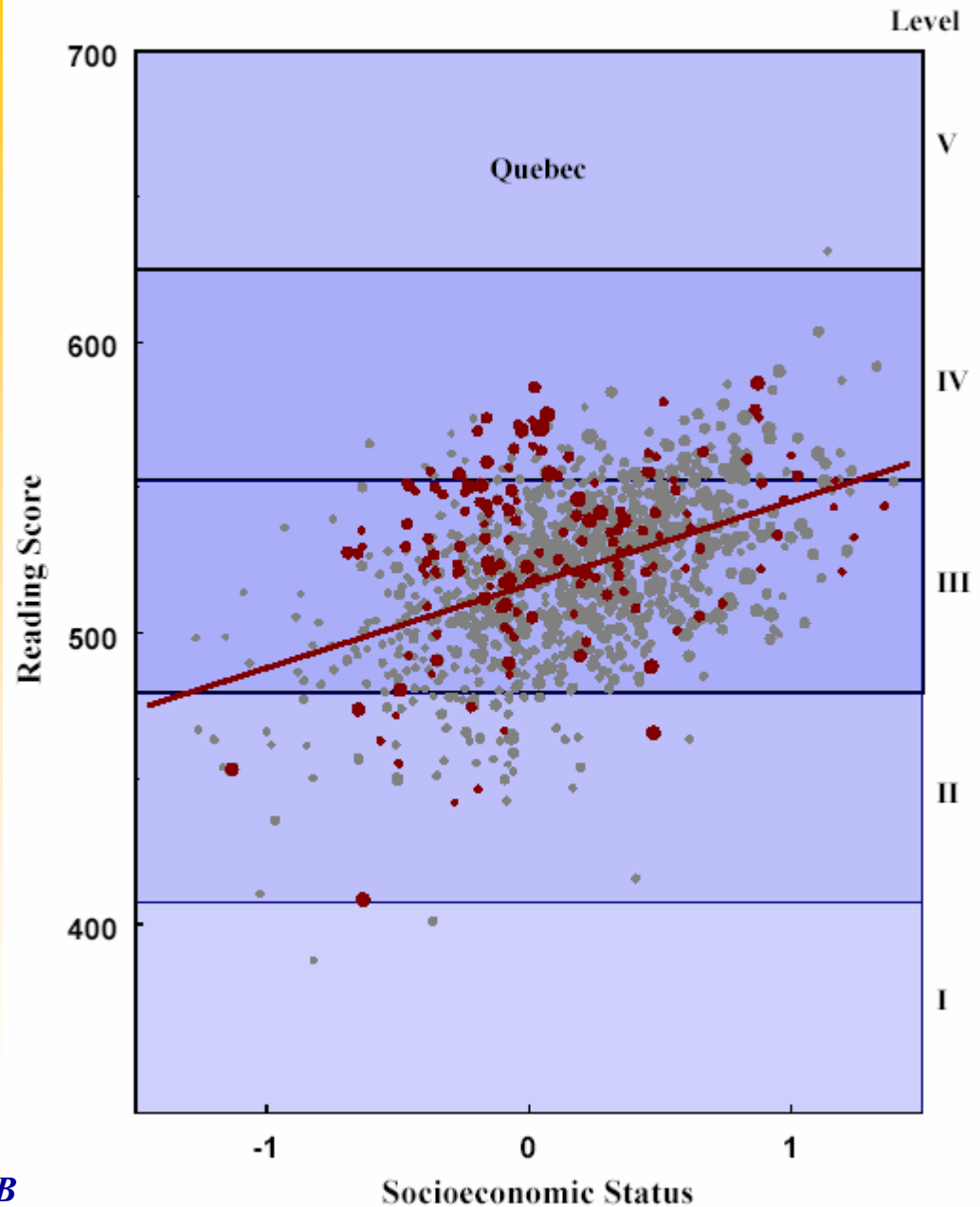


# School Profile for Quebec

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 its 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

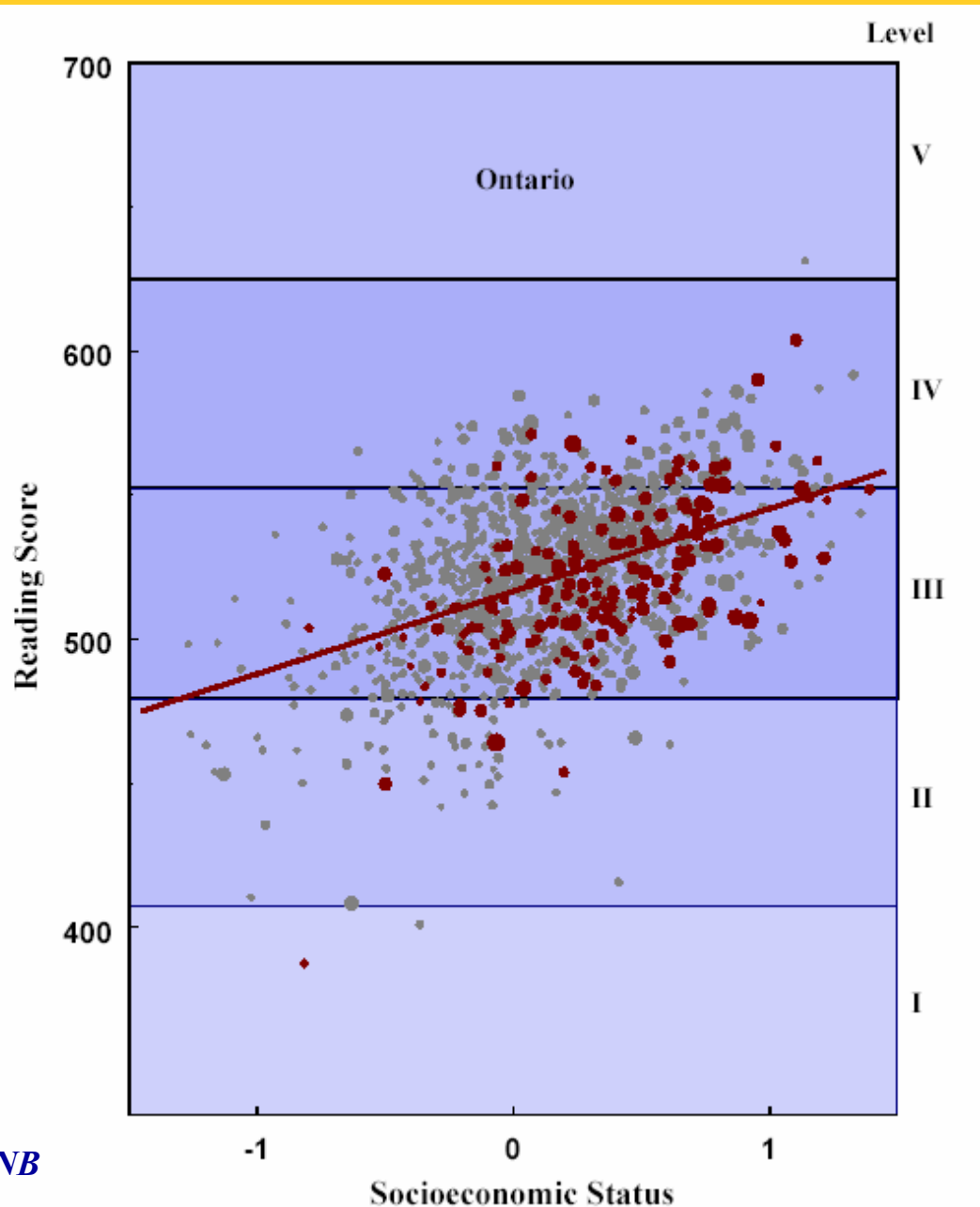


# School Profile for Ontario

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

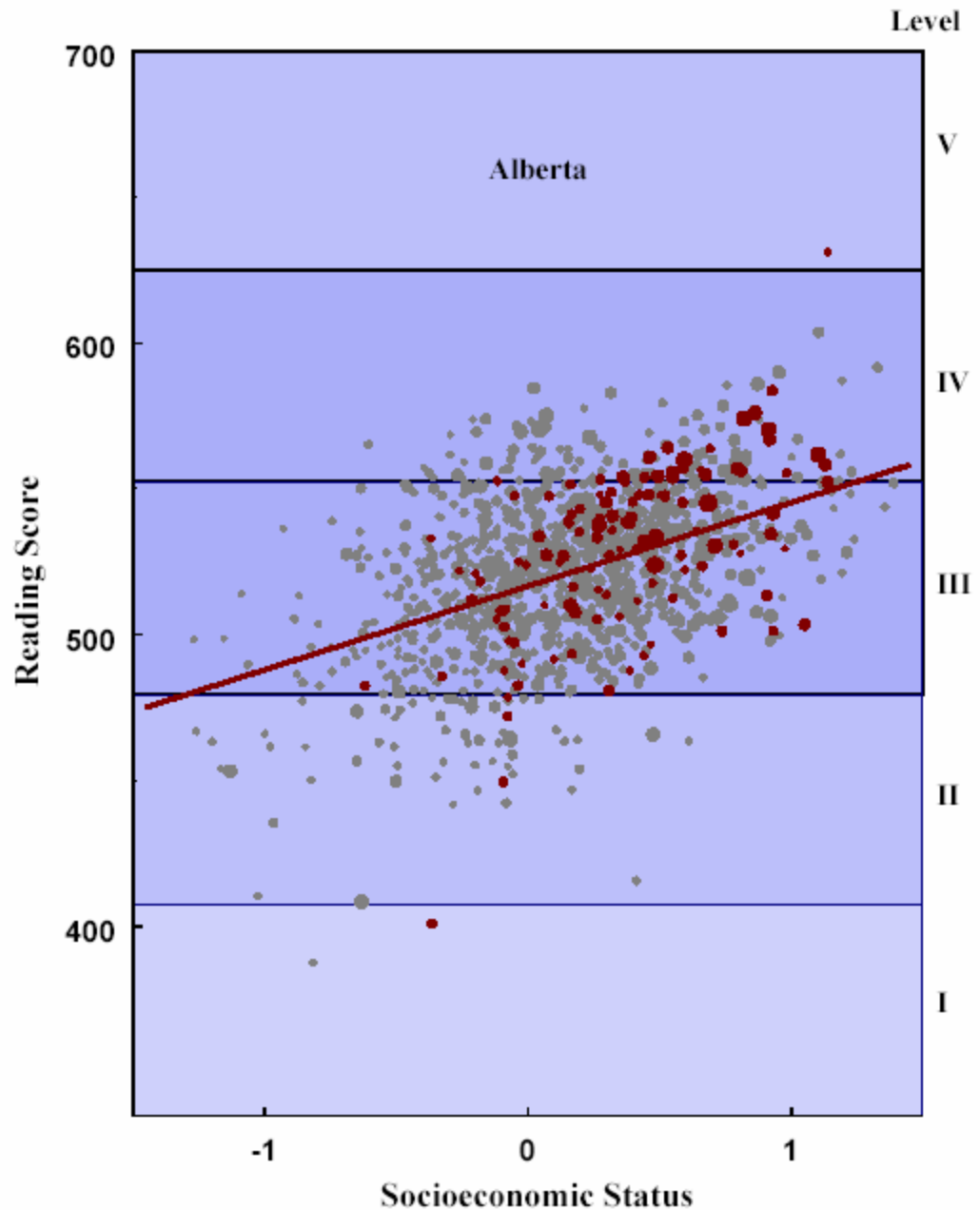


# School Profile for Alberta

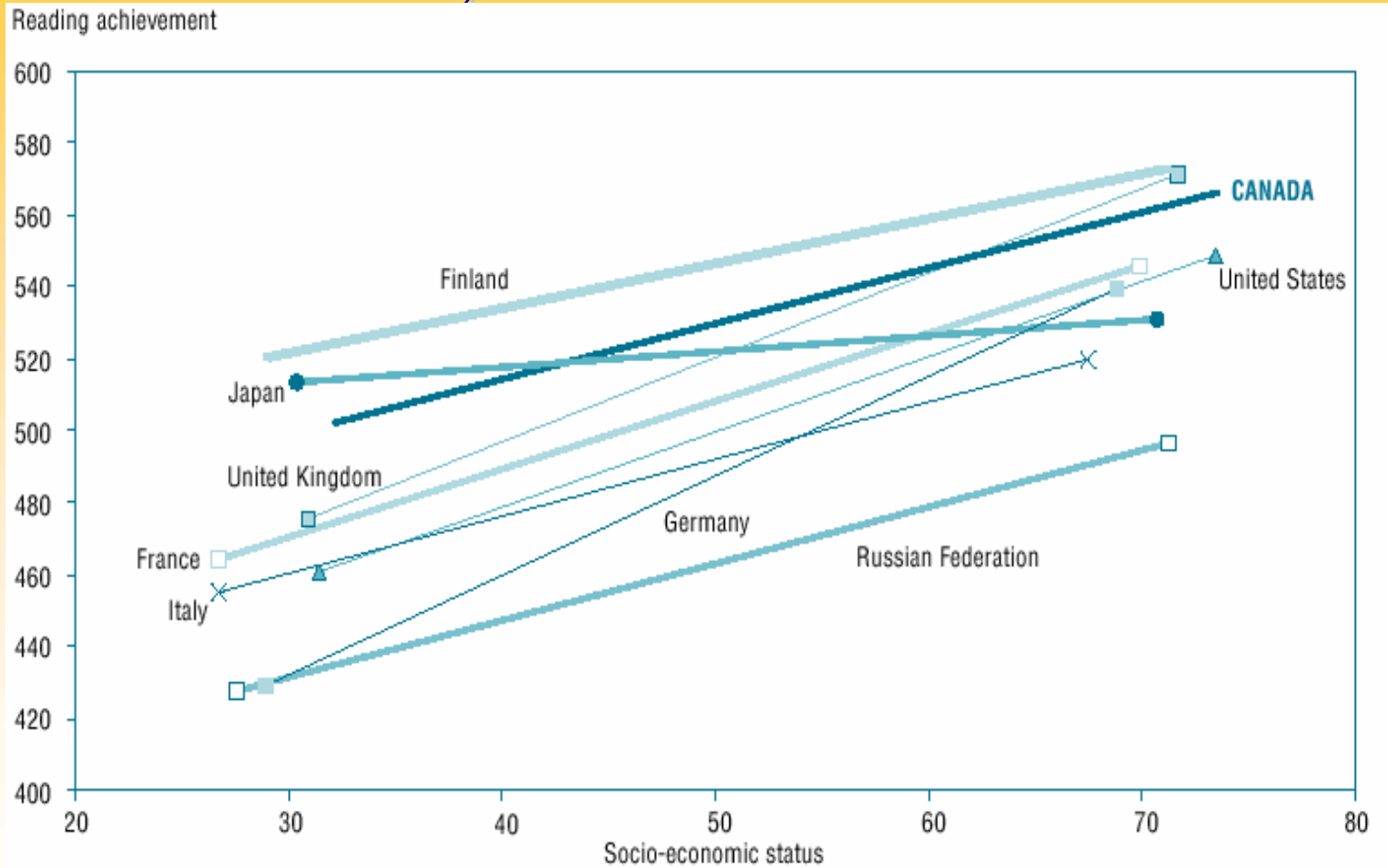
The relatively high performance of Alberta students is partially owing to its relatively high level of SES. The results in Tables 1 and 2 indicated that its mean score after adjusting for SES was about 535, similar to the Canadian average. This is reflected in its school profile as well. Most of the 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.



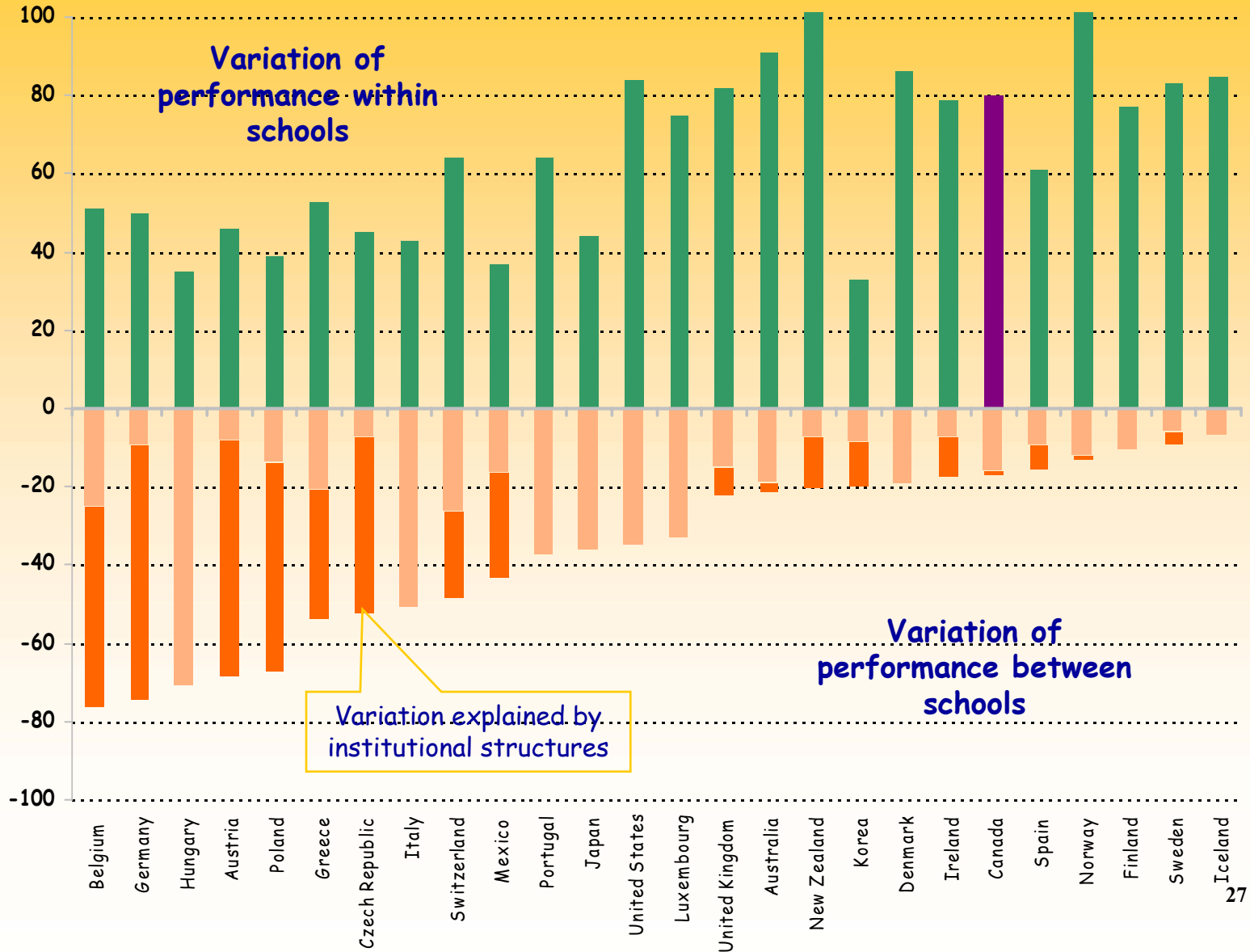
Source: J. D. Willms, UNB



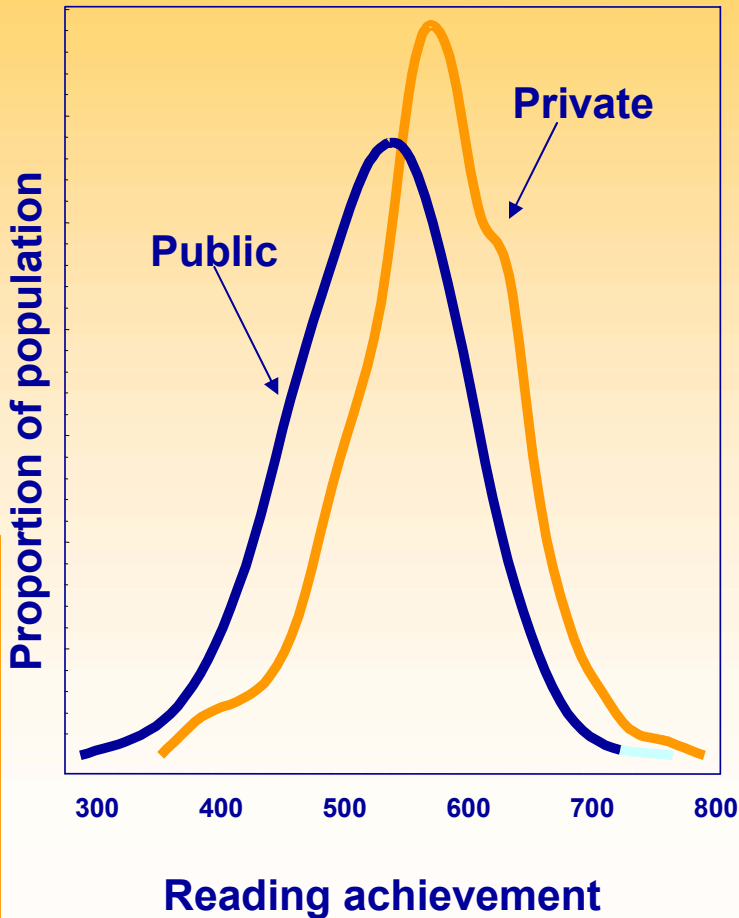
# Socio-economic Gradients of G8 Countries and Finland, PISA READING



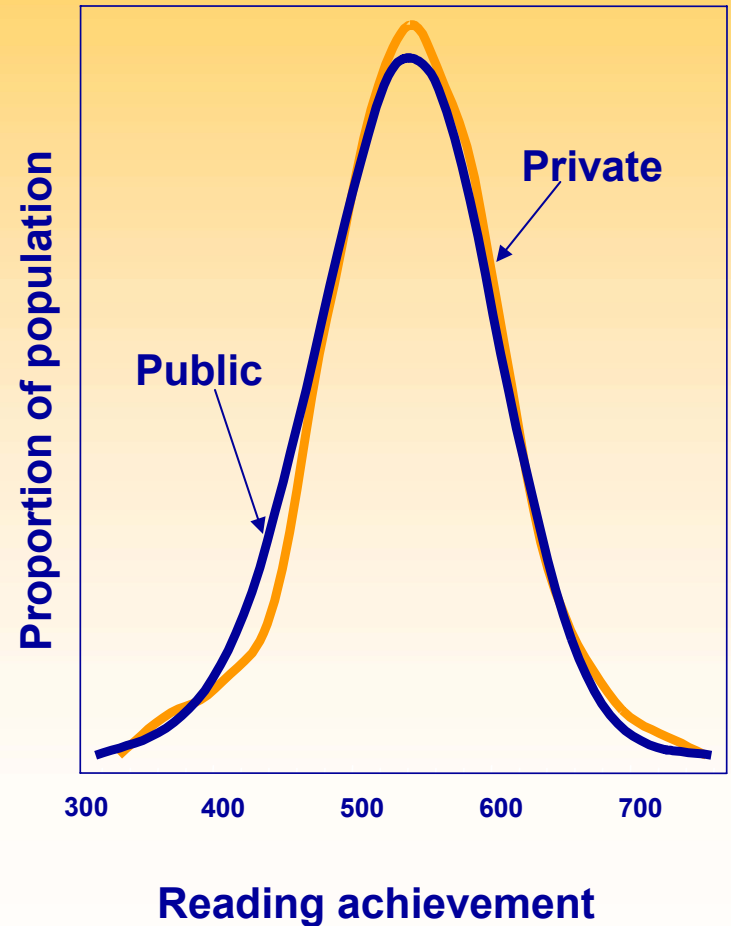
# More variation in student reading performance within than between schools



## The apparent private school advantage



## After controlling for parental SES-private school advantage disappears



# 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

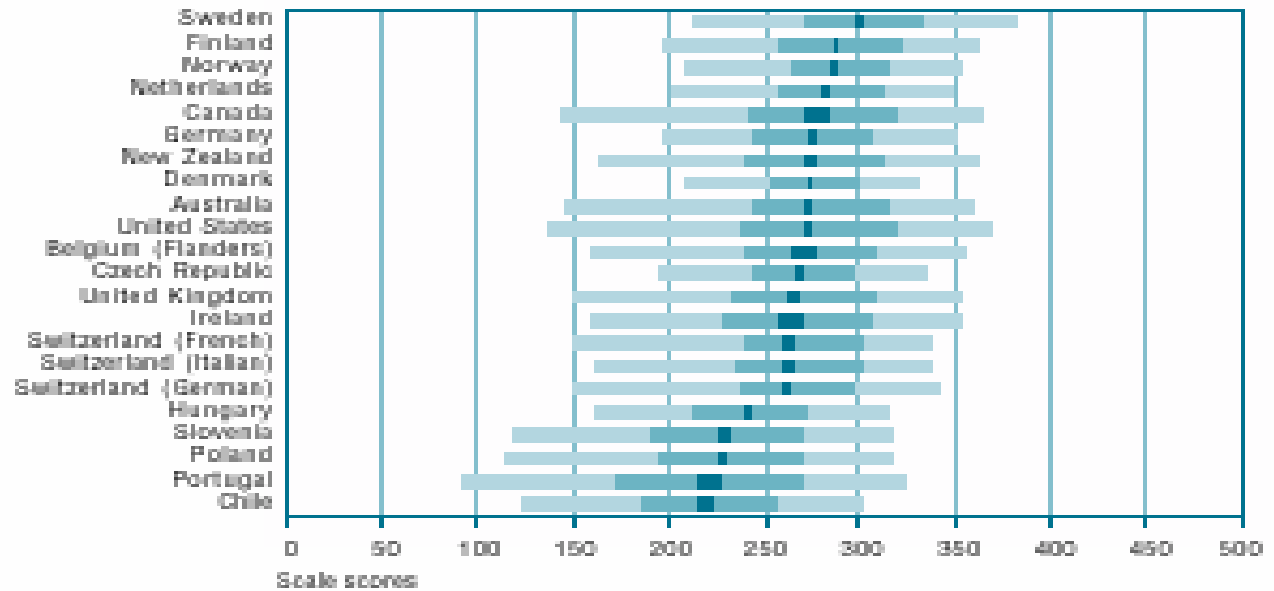


Source: J. D. Willms, UNB

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



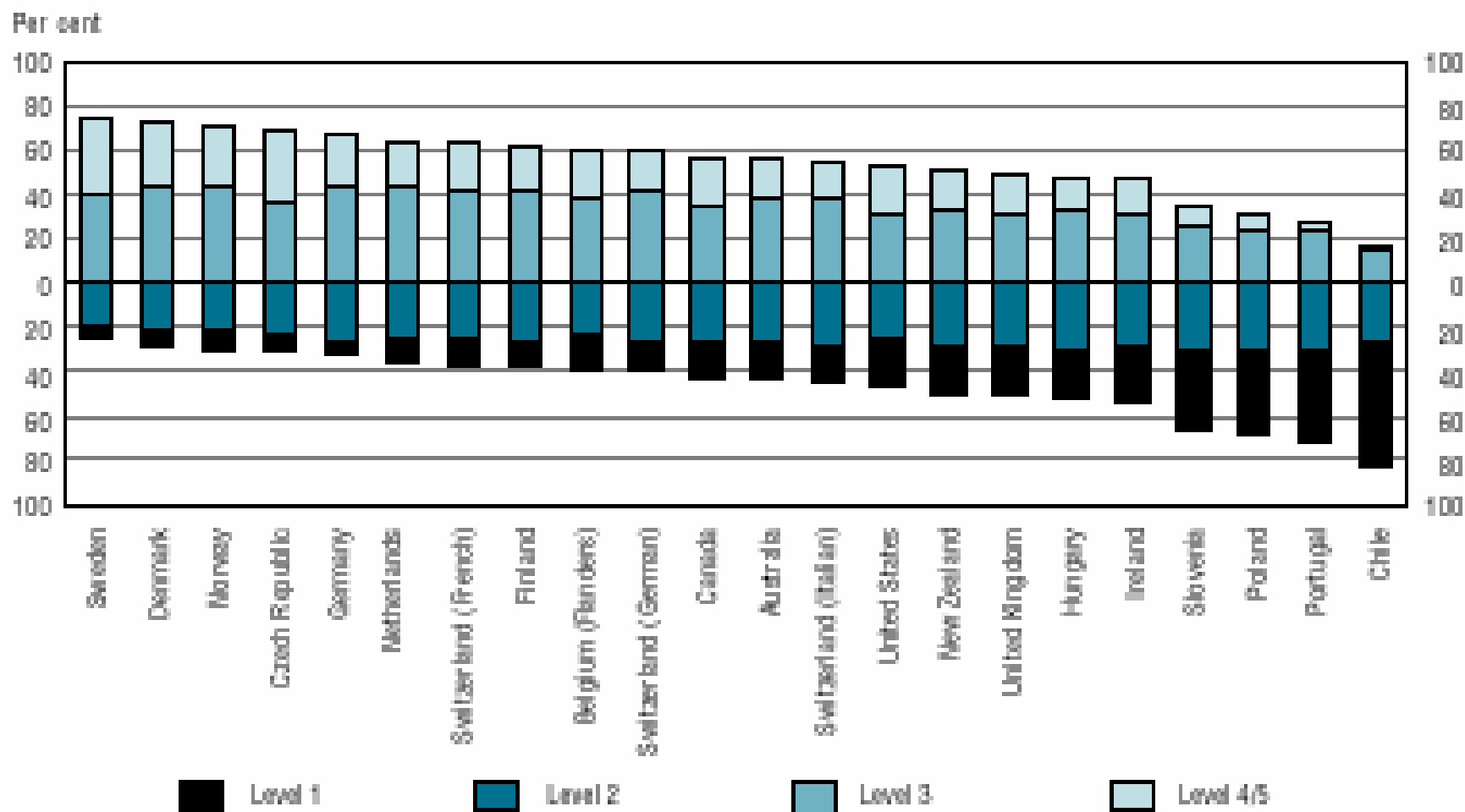
Countries are ranked by mean scores.



FIGURE 2.2 (continued)

COMPARATIVE DISTRIBUTION OF LITERACY LEVELS

C. Per cent of population aged 15-65 at each quantitative literacy level, 1994-1998

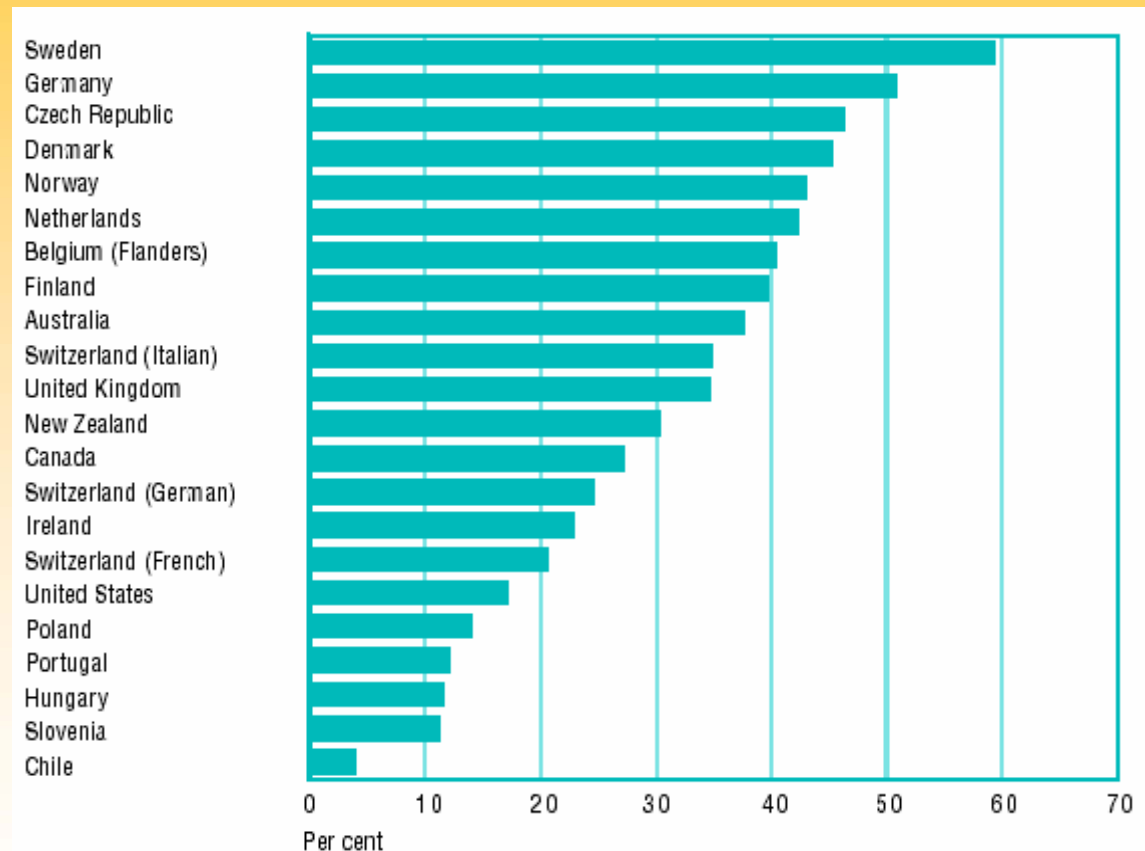


Countries are ranked by the proportion in Levels 3 and 4/5.

Source: International Adult Literacy Survey, 1994-1998.

# Document literacy levels among low educated adults

Per cent of population aged 16-65 who have not completed upper secondary education but who score at Levels 3 and 4/5 on the document scale, 1994-1998



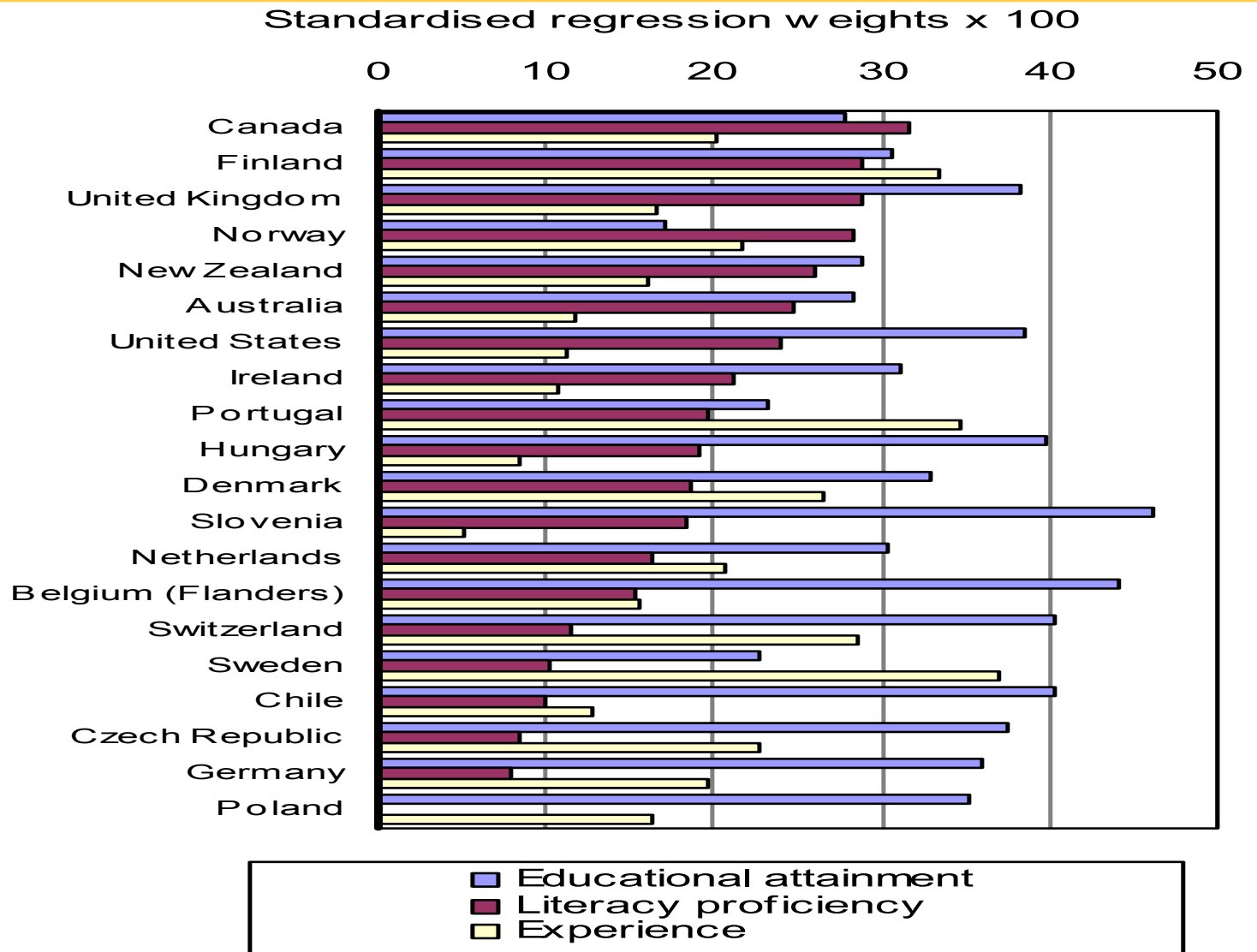
Countries are ranked by the proportion of the population without upper secondary graduation who are at Levels 3 and 4/5

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



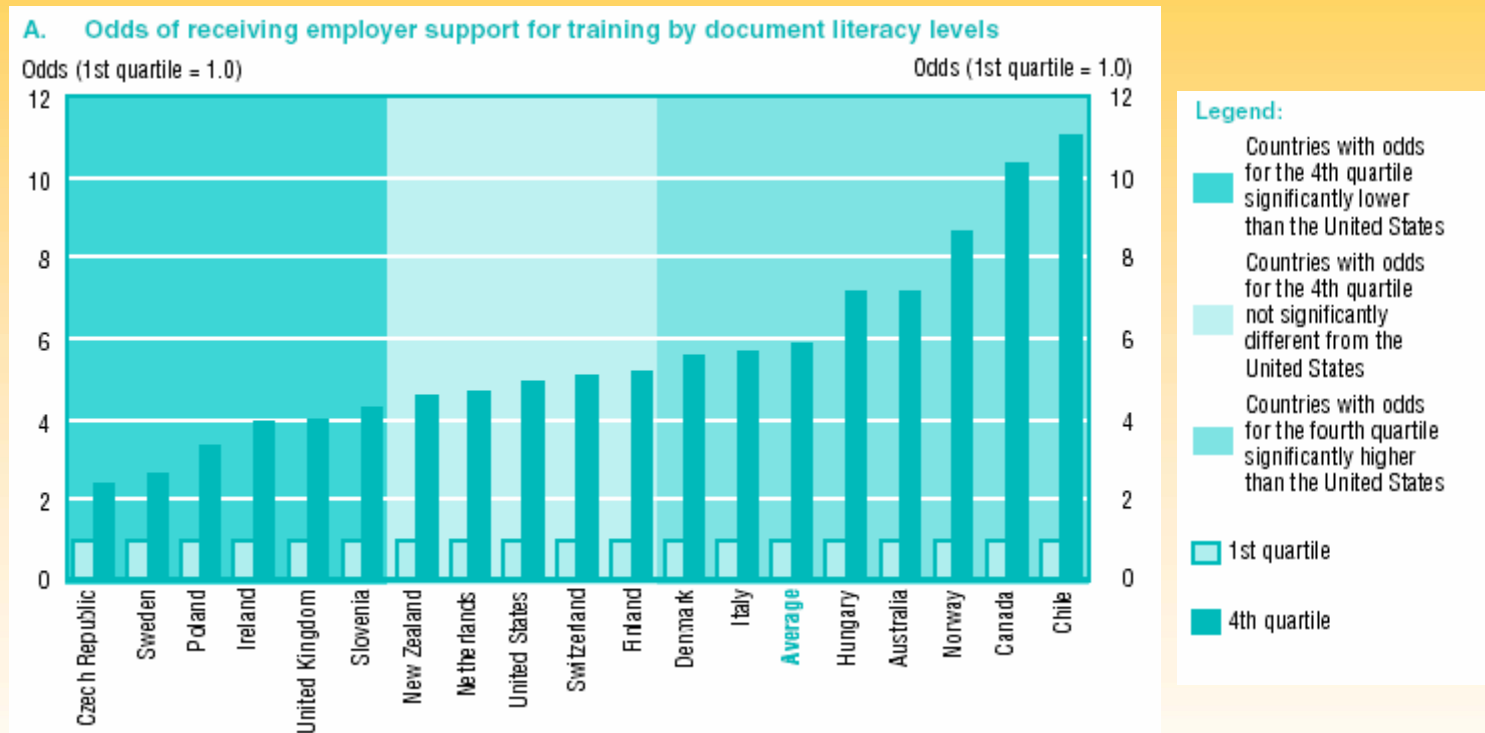
# Earnings and literacy proficiency, controlling for education and labour force experience

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



# Likelihood of receiving employer support for training

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



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

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

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

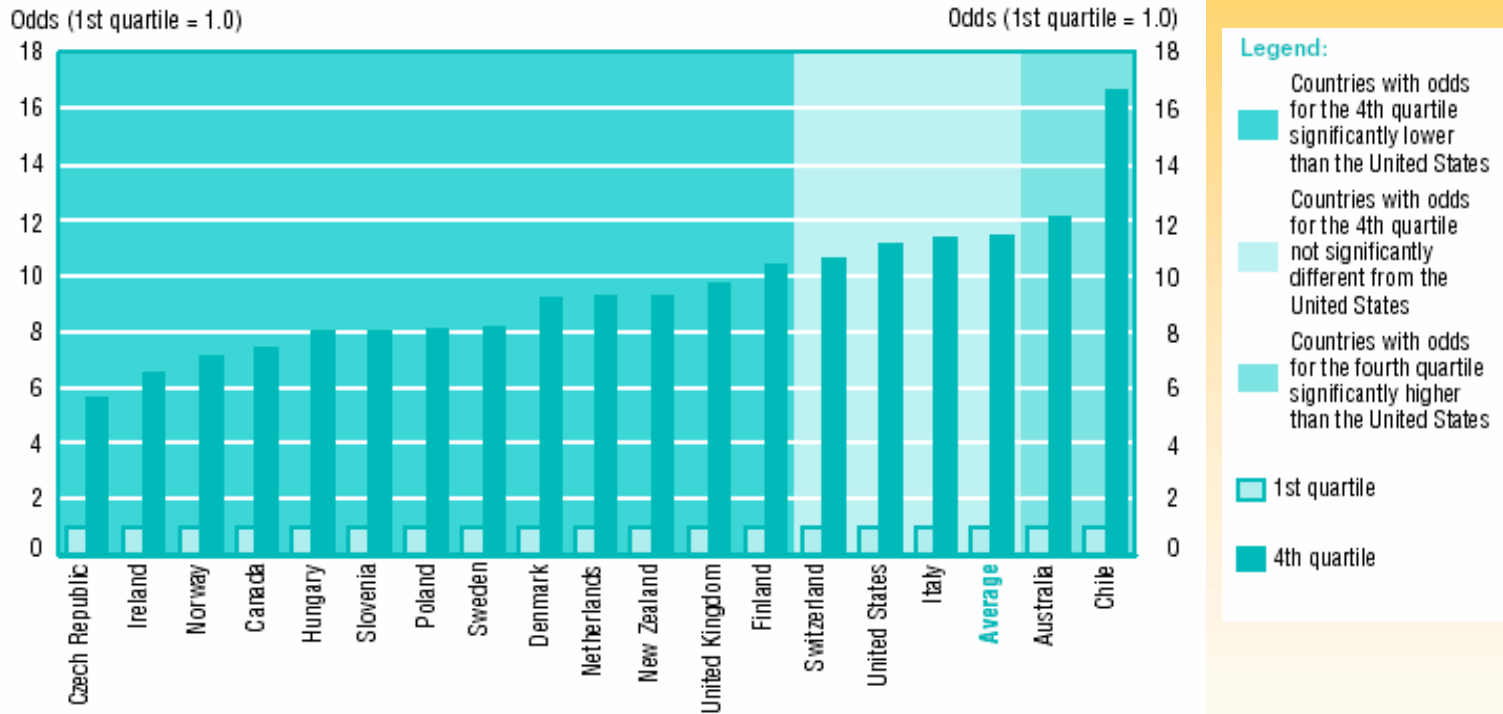
*Adult Education Participation in North America: International Perspectives.*



# Likelihood of receiving employer support for training

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

B. Odds of receiving employer support for training by literacy engagement at work



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

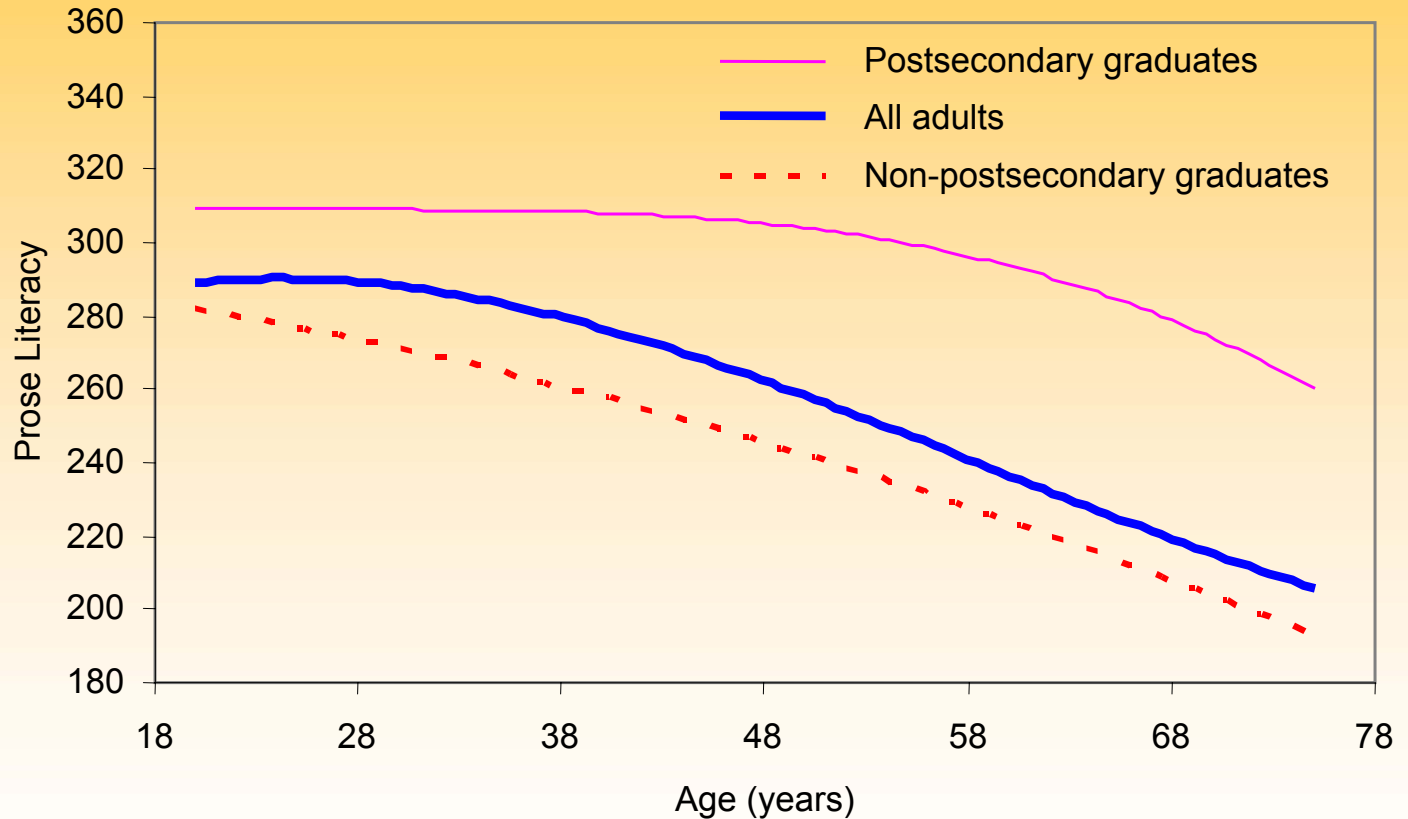
Note: Statistical difference is significant at  $p < .05$ .

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

*Adult Education Participation in North America: International Perspectives.*



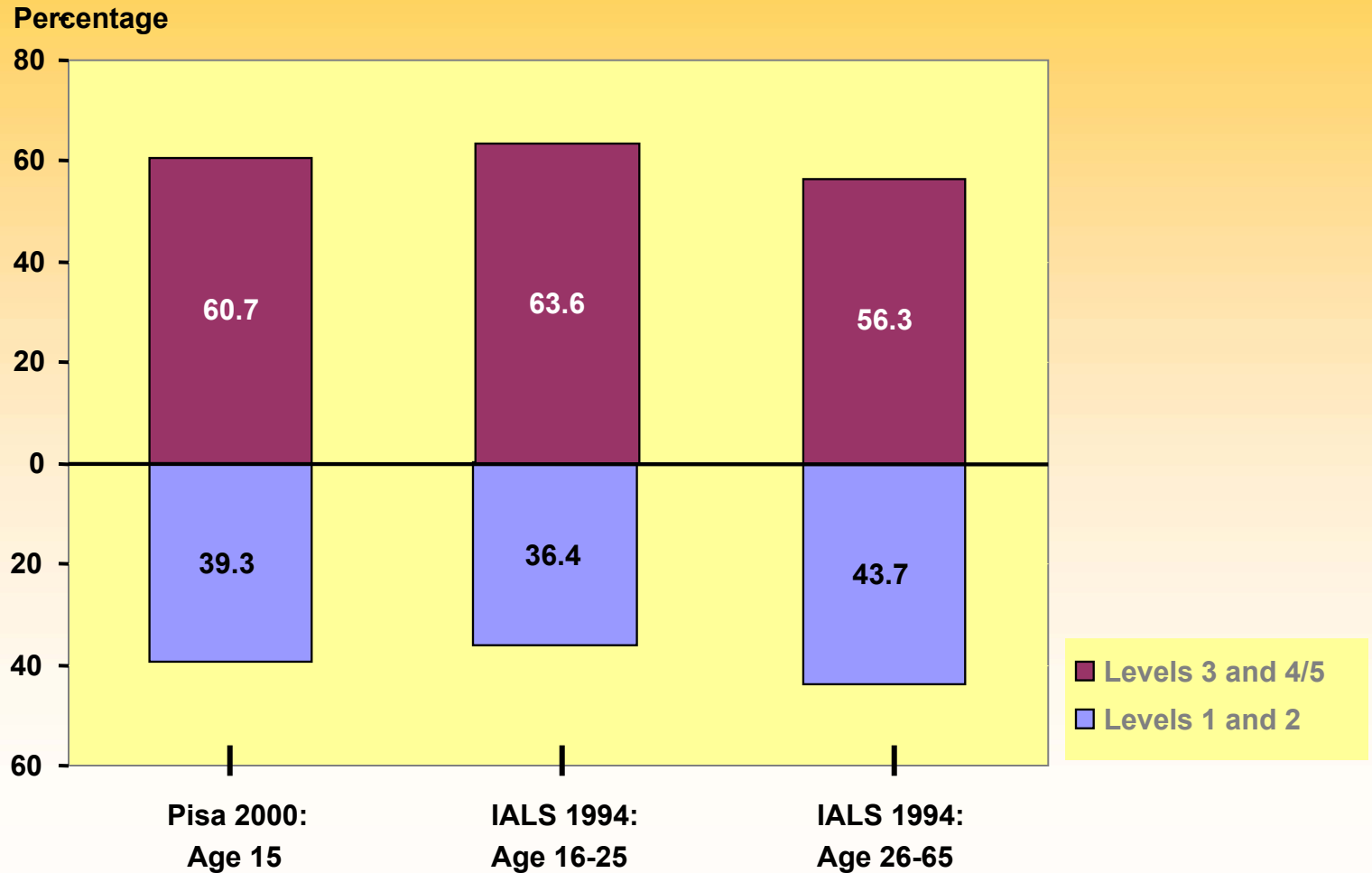
# Prose Literacy by Age: Canada



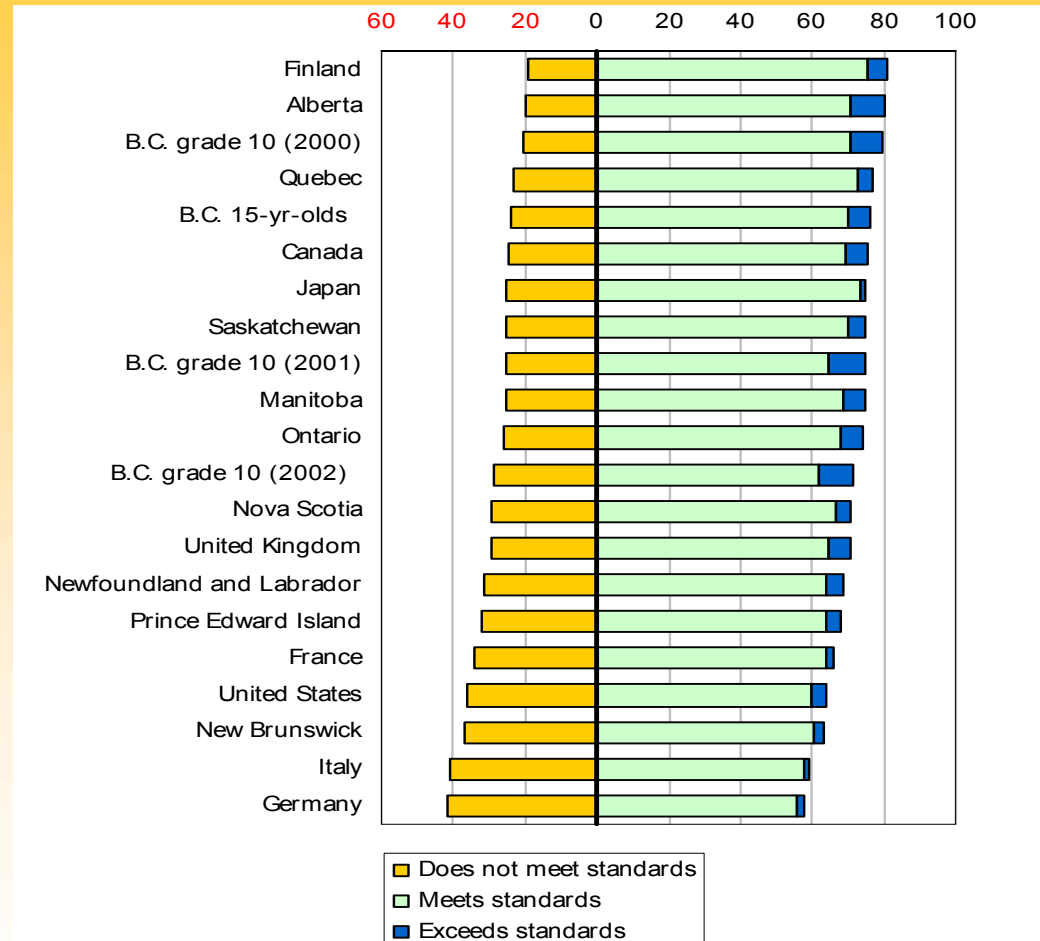
# A reconciliation of PISA and IALS scales: Percentile distributions and Levels



# Percentage at Proficiency Levels for Canada: on IALS Scales



# Percentage of 15-yr olds from various jurisdictions attaining BC grade 10 reading standards, 2000



<sup>1</sup> All results shown here are for 15-year-olds except for BC grade 10 students who are, on average, 6 months older than BC 15 year olds.

Jurisdictions ordered by the percentage of students meeting or exceeding expectations.



# What we will soon know

- From YITS/PISA:** How PSE access and persistence are conditioned on literacy skill?
- From IALS/ALL:** How rapidly are skill profiles evolving?
- From ALL Level 1 Study:** What are the component reading skills of level 1 respondents
- From WES-Skill** How literacy interacts with firm characteristics
- From ALL:** Tools for individuals diagnosis and PDQ locator test and full test placement
- From ALL:** Small area estimates for CSDS + FEDS



# How do we fare?

## In terms of statistical infrastructure

### Good

- Longitudinal sources in place at all ages
- Strong linked direct measures across surveys – NLSCY, PISA/YITS, IALS
- Trust and common purpose established

### Bad

- No permanent funding in place for most of the program
- NLSCY trajectories
- Non-response in the NLSCY
- Unbalanced governance:
  - Academics
  - Stakeholders

### Ugly

- No process variables
- No integrated access
- No program to capitalize on existing admin data
- No small area estimates



# How do we fare?

## In terms of useful findings

- Relative position is good judged in terms of incidence, quantity, quality and equity of educational outcomes through adolescence
- Outcomes are conditional
- A lot of little things matter a little, add them together and they matter a lot
- Behavioural and cognitive outcomes interact constructively and destructively
- What happens outside school matter a lot
- Markets for skill are efficient

