Reconstructing the evolution of the American supply of cognitive skills: A synthetic cohort analysis
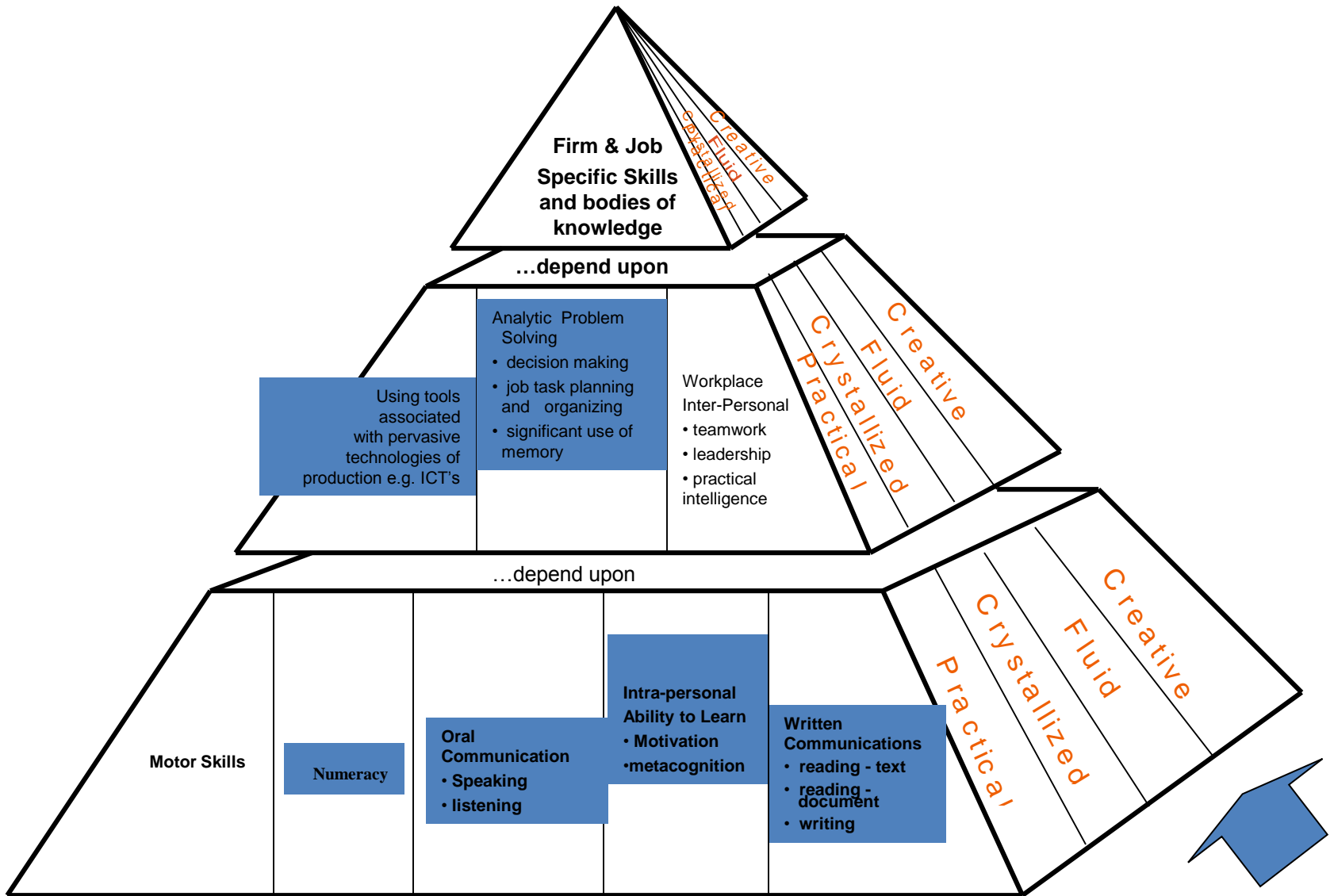
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Motivation for the analysis:

- Rising years of schooling should have raised average adult literacy levels by roughly 50 points between 1994 and 2011 in both Canada and the US

- Unexpectedly, average literacy skill levels fell an average of 7 points between 2003 and 2011 in Canada and 9 points in the US

- The observed loss of skill is problematic because it was expensive to create and has enormous productive value. In Canada $61 in lost earnings per year per point.

A Framework for Thinking About Cognitive Skills :Literacy is fundamental to the efficient acquisition of higher order skills and their application

Firm & Job Specific Skills and bodies of knowledge

Creative
Fluid
Crystallized

…depend upon

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

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

Workplace Inter-Personal
• teamwork
• leadership
• practical intelligence

Creative
Fluid
Crystallized
Practical

…depend upon

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

The World of Work

Literacy: the key to fluid and creative thinking

A Framework for Thinking About Essential Skills : Demand
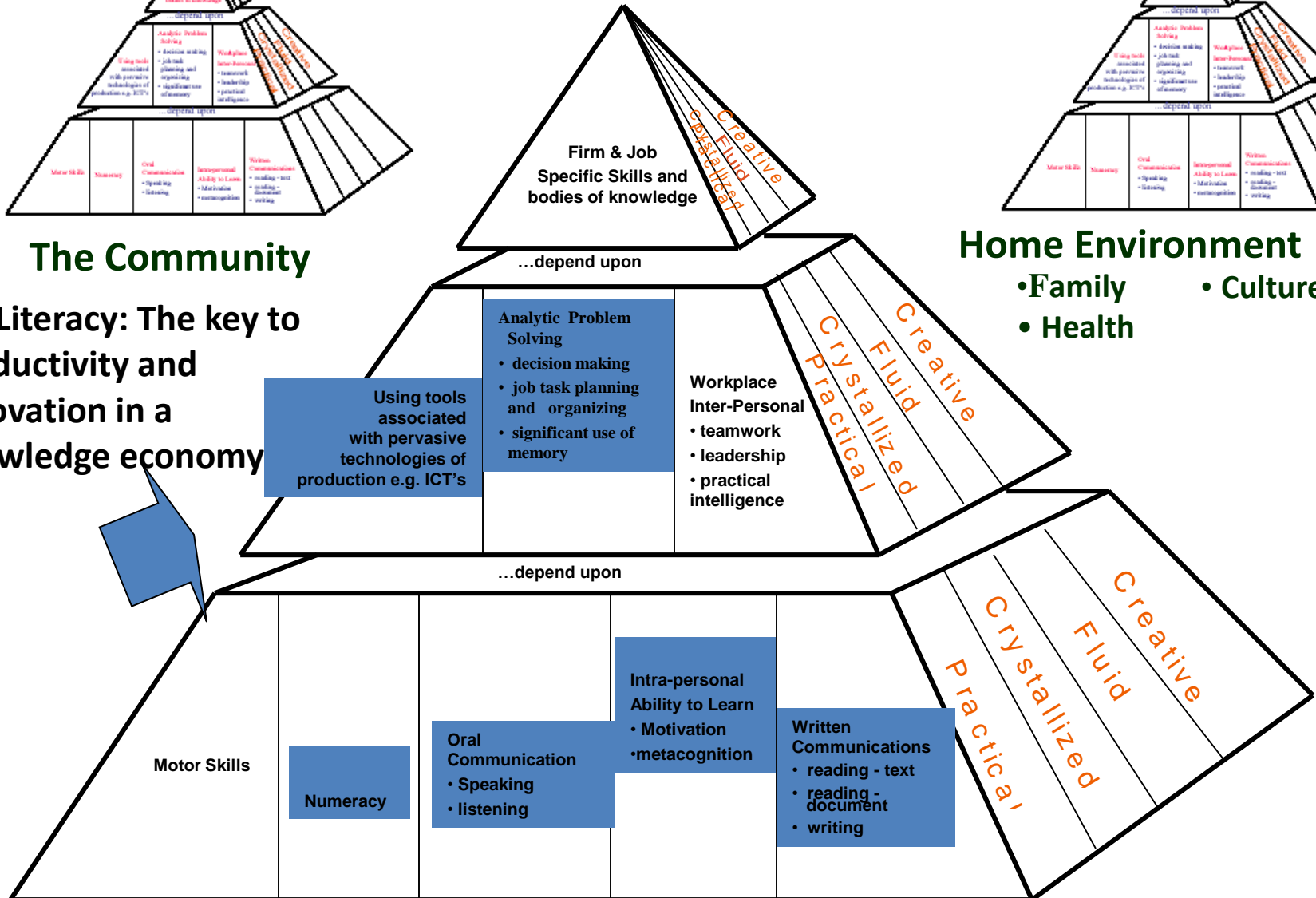
Profiles of Skill Supply and

The Community

Home Environment
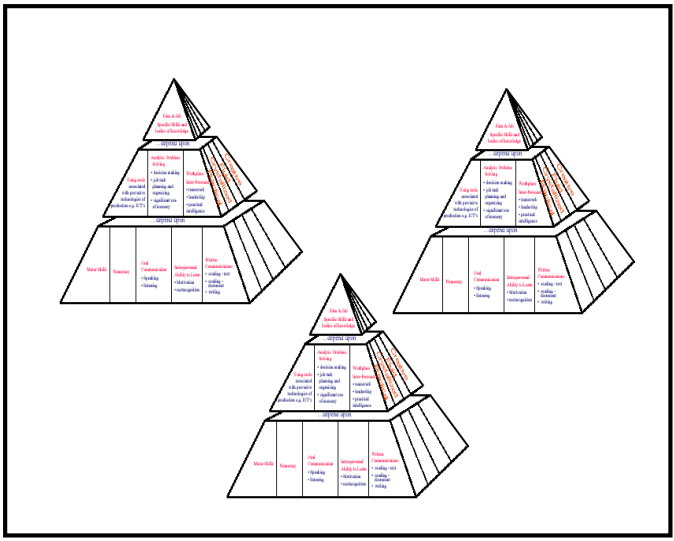- Family
- Culture
- Health

ICT Literacy: The key to productivity and innovation in a knowledge economy

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Theoretical Framework: a "Markets" Model of Skill

Skill Demand

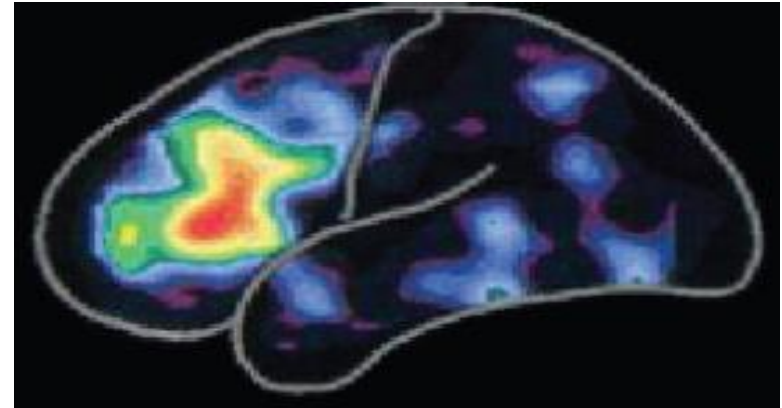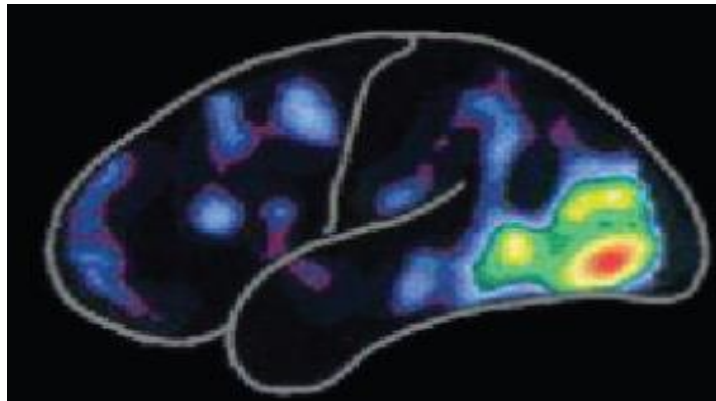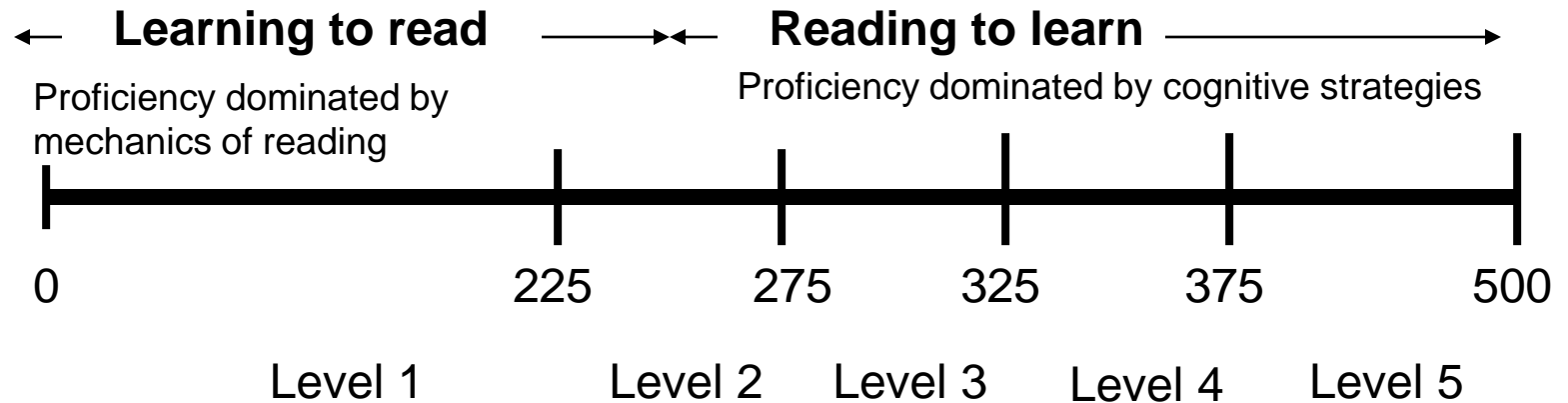**Markets for skill:**

- Education
- Labour
- Health
- Social

Skill Supply = skill stock + net skill flow from lifelong, life-wide learning

+ quality of early childhood experience

+ quantity of primary and secondary education

+ quantity and quality of tertiary

+ quantity and quality of adult learning (formal, non-formal, informal)

+/- immigration

+/- emmigration

- skill loss associated with insufficient demand

- +/- social demand for skill

- +/- economic demand for skill

Outcomes

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

Learning to read to reading to learn: we need more people able to function at Level 3 in the pre-frontal cortex
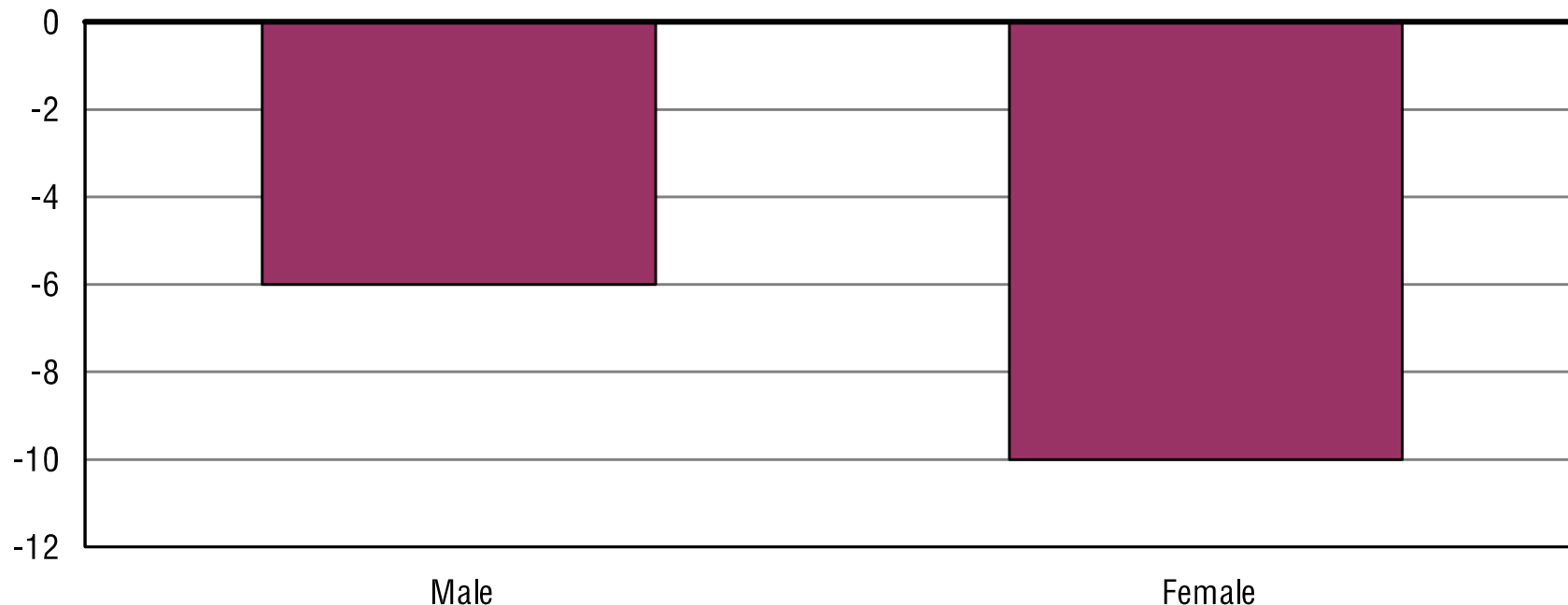

← **Learning to read** →← **Reading to learn** →

Proficiency dominated by mechanics of reading

Proficiency dominated by cognitive strategies

0   225   275   325   375   500

Level 1   Level 2   Level 3   Level 4   Level 5

A comparison of cross-sectional distributions reveals that skill loss touchs all population sub-groups even after one has adjusted the data to remove the effects of shifts in demographic composition that occurred during the period

US adult males lost an average of 6 points, women 13

Average difference in average literacy score between ALL and PIAAC by gender at the time of the PIAAC study, adults aged 26 to 65, United States, 2011
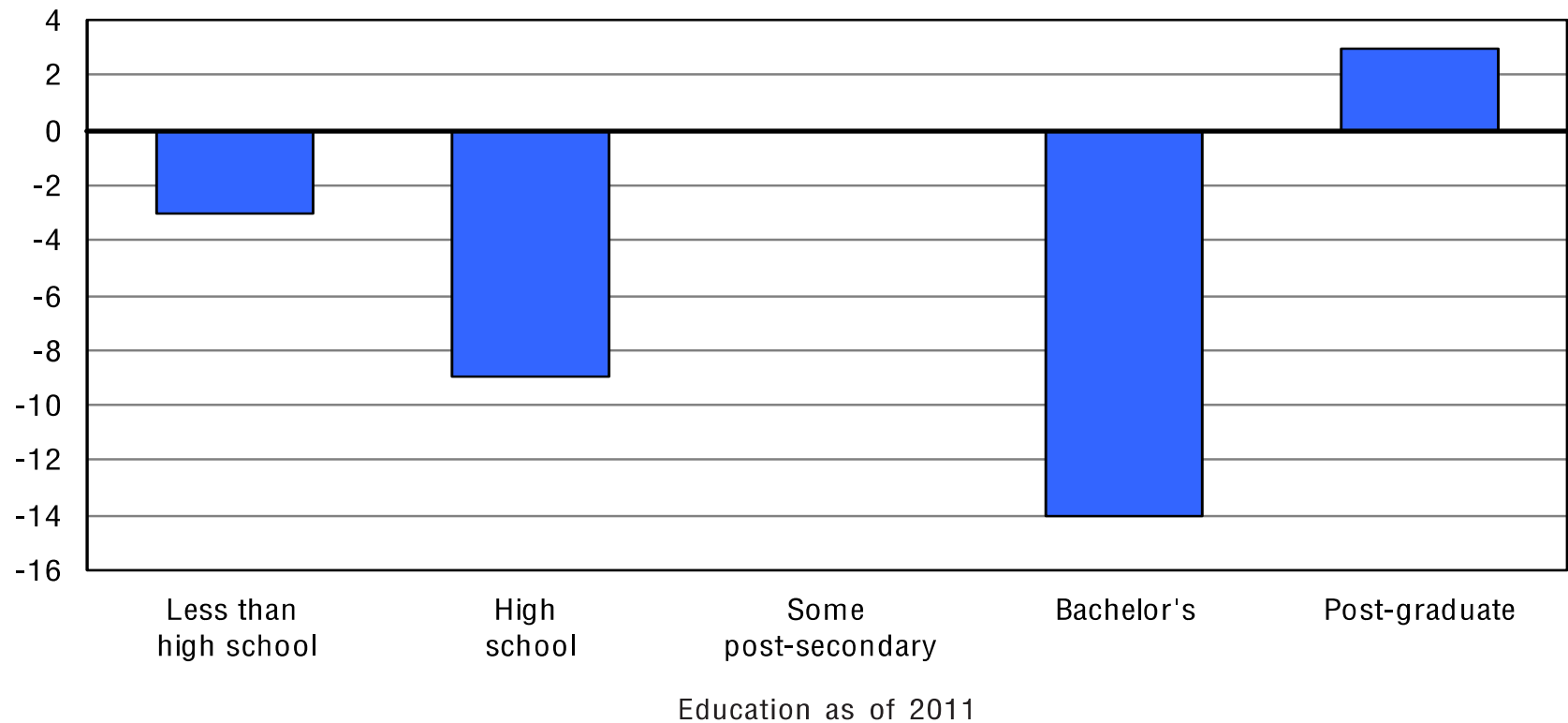
Change in average score 2003-2011

US high school dropouts lost an average of 9 points, high school grads 12 points, post-secondary graduates 11 points

Average predicted literacy scores by education, 2003 ALL and 2011 PIAAC, adults aged 26 to 65, United States, 2011

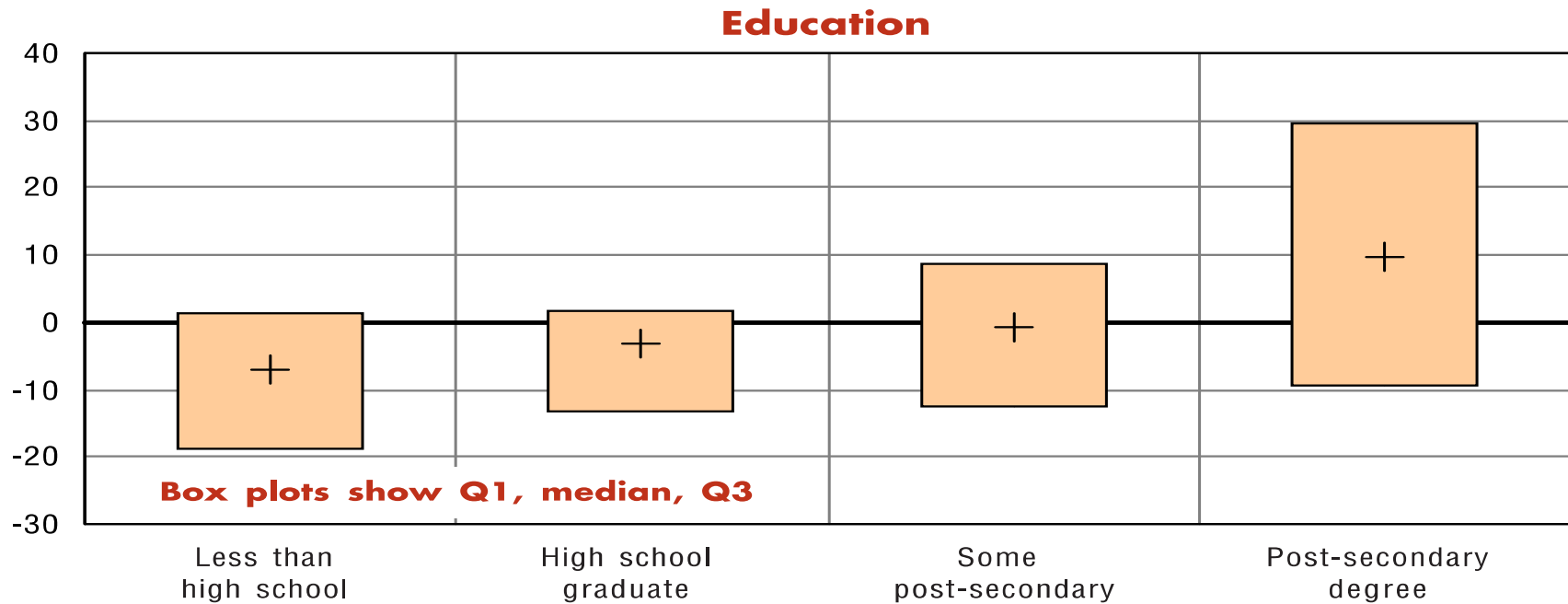Change in average score 2003-2011

Education as of 2011

The key policy questions:

- What is the distribution of skill gain and loss that define these average skill losses?

- What factors are associated with skill gain and loss?

Creating the synthetic cohort:

- Donor pool created using static demographic characteristics i.e. age and sex

- Donor pool limited to include education at or above 2003 level

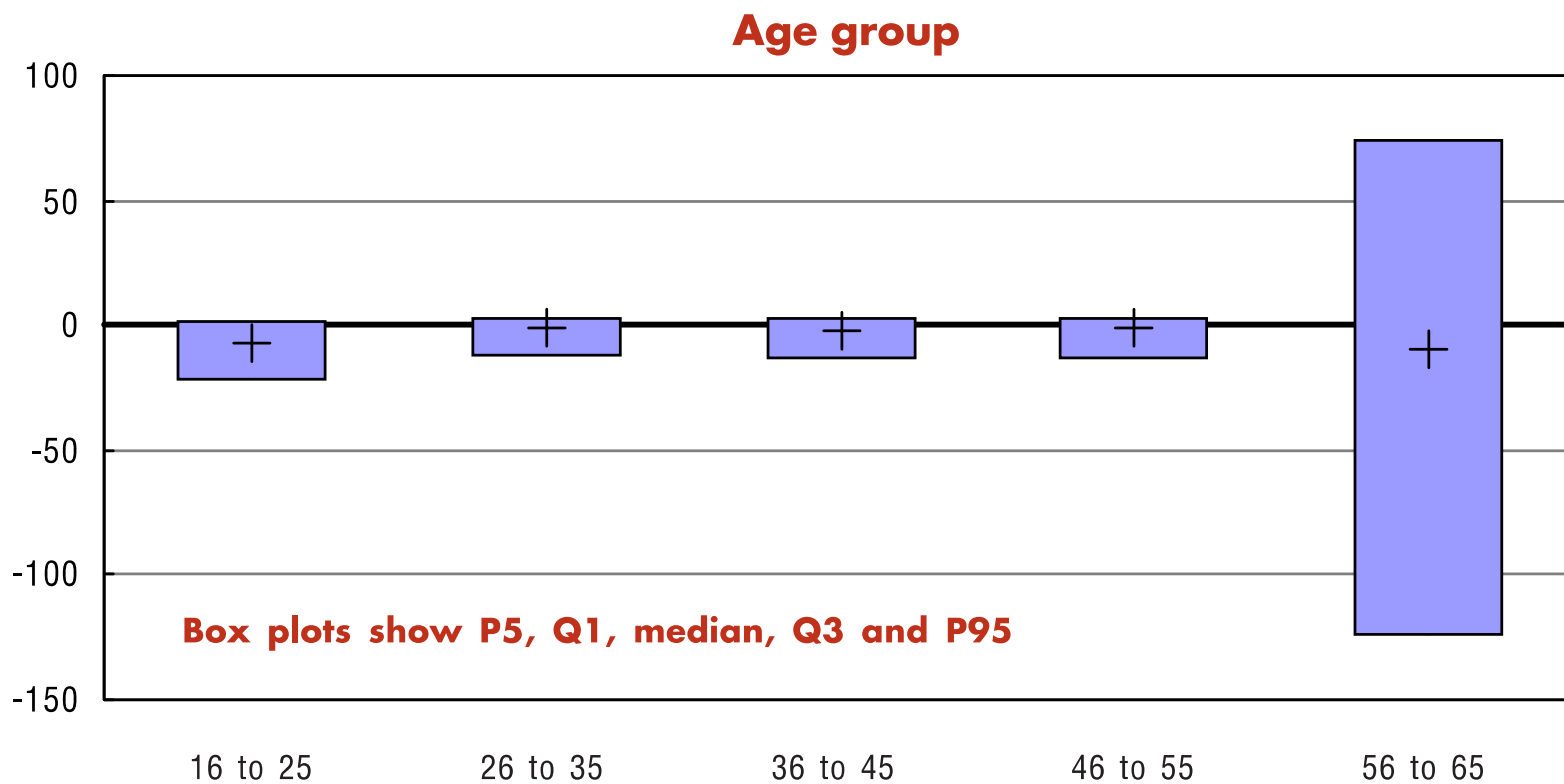- Records then linked conditionally within matrix on closest score

The synthetic linkage suggests the average change in skill are the net product of significant skill gain and loss.. By education level

Education

Box plots show Q1, median, Q3

Less than high school · High school graduate · Some post-secondary · Post-secondary degree

And age group

Determinants of skill gain and loss in Canada

- The frequency of skill use has little impact on either skill gain or loss

- The use of skill in cognitively demanding ways is associated with skill gain,

- The use of skill in non-demanding routine ways is associated with skill loss

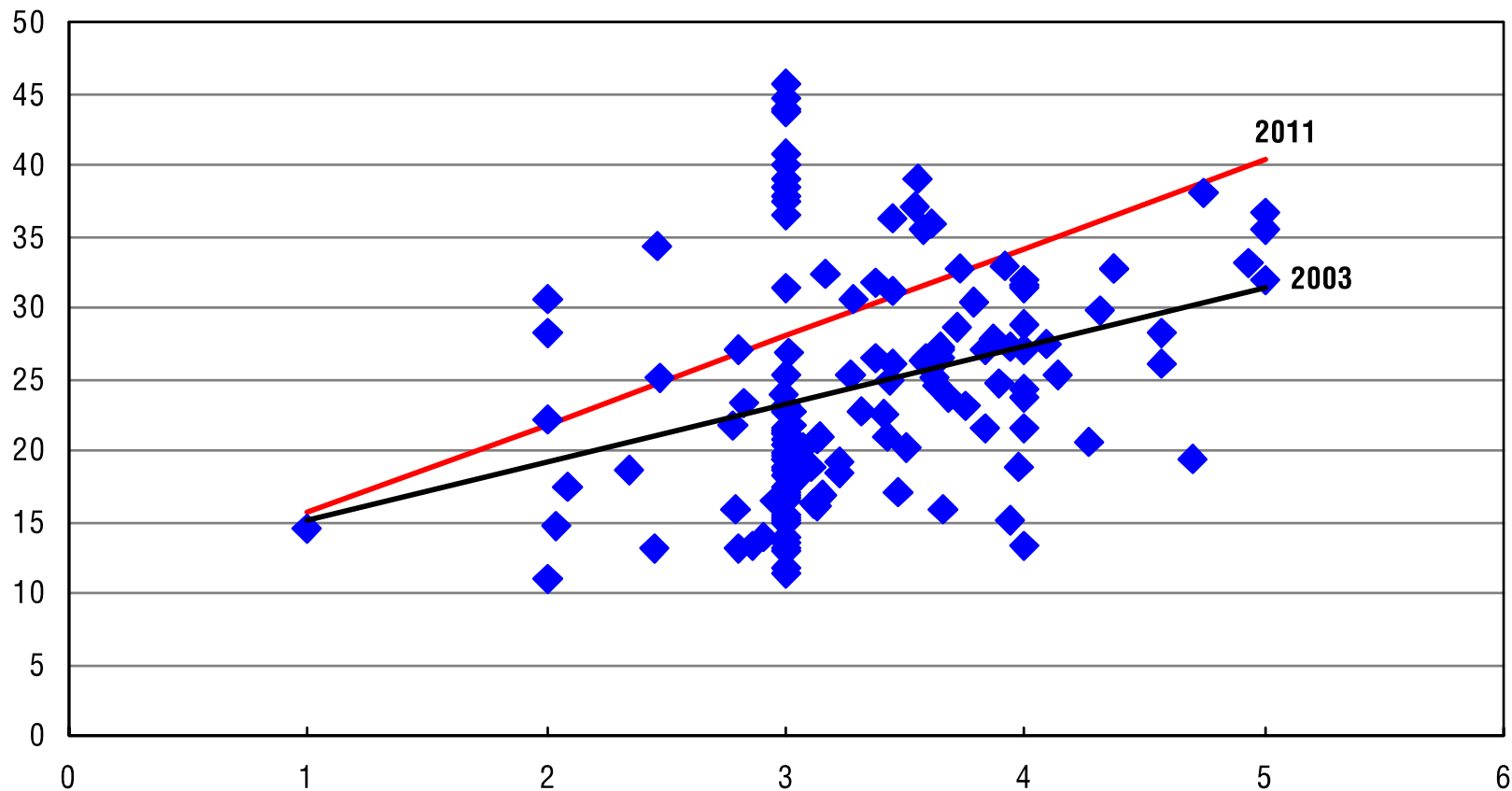# Determinants of skill gain and loss in the US

- The US results mirror the Canadian results but there is not enough sample to include all of the variables in the analysis

Policy implications:

- Policy makers have long assumed that policy should concentrate on generating adequate skill supply and on creating credentials that reduce selection costs for employers and that improve the fit between job demands and worker skills
- These data suggest that policy must also focus on the demand for skill. A failure to generate sufficient literacy skill demand sacrifices economic output and risks that any new supply will not be taken up and put to productive use

Increases in the demand for literacy skill in Canada has driven a rapid increase in the earnings premium for skill

Policy implications:

- More deeply, left to their own devices, a significant proportion of employers have adopted a low skill/low wage strategy
- Such a strategy is not sustainable in the current global economy as low skilled jobs will either be automated or will flow to lower cost but equally skilled foreign competitors, demand for skill is bound to rise
- Government policy needs to focus on inducing employers to create more high skill/high wage jobs