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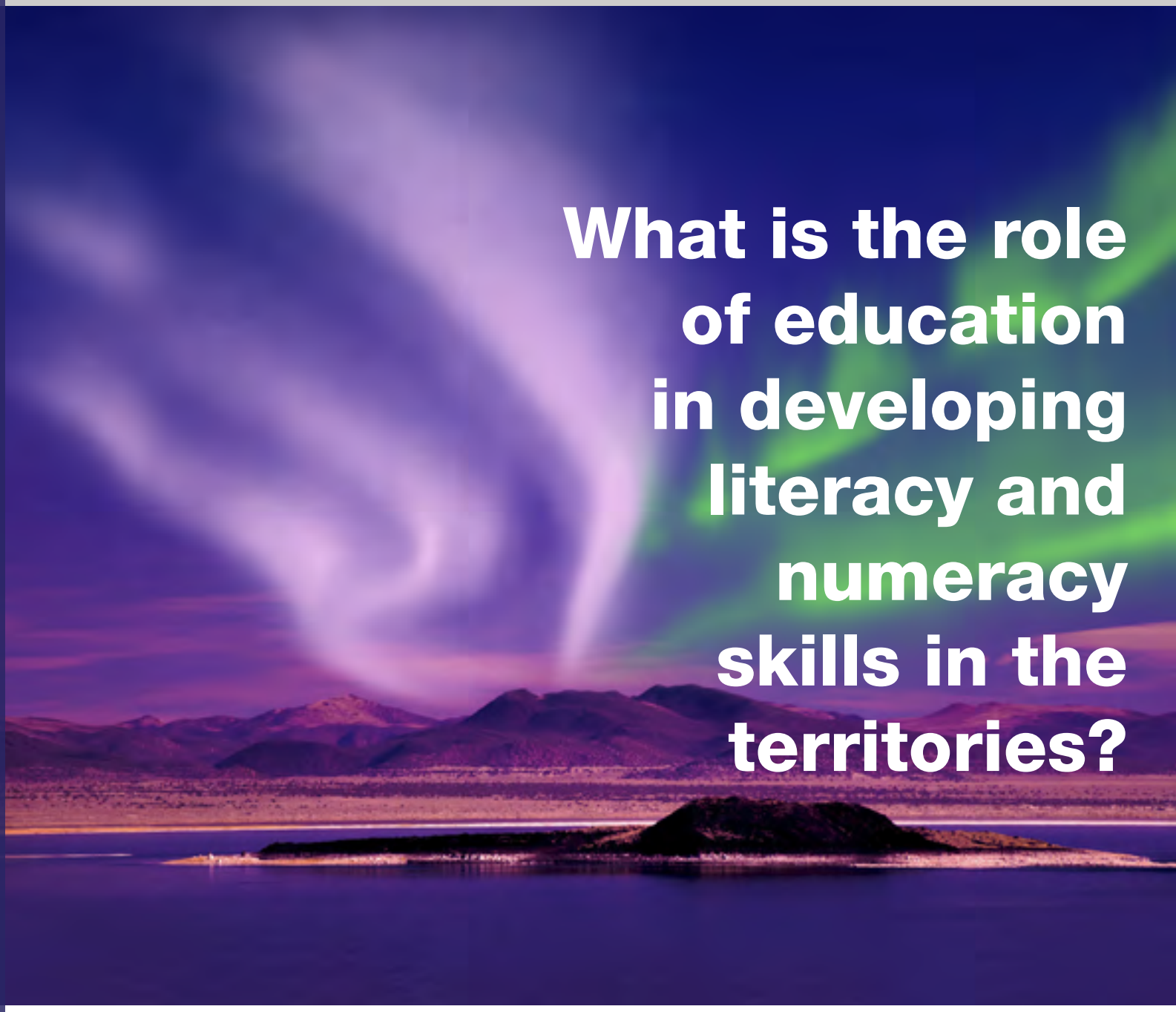
in FOCUS: PIAAC in Canada

In Focus: PIAAC in Canada is a series of concise policy-oriented analyses designed to describe a PIAAC topic in Canada.



What is the role of education in developing literacy and numeracy skills in the territories?

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KEY FINDINGS

In the three territories, higher levels of educational attainment, participation in adult education and training, and parental education all contribute positively to skills performance for both Aboriginal and non-Aboriginal populations.

Literacy and numeracy are foundational skills that are essential for individuals to fully participate in society, both economically and socially. This is true no matter where we live. Developing the knowledge and mastering the skills required to participate in our society depend on commanding these basic skills. In particular, studies have shown that better foundational skills are associated with better economic and social outcomes.[1] The importance of these skills implies a need to understand how they are developed and how public policy can affect their development.

Where do Canada's northern territories stand when it comes to proficiency in literacy and numeracy skills? The Programme for the International Assessment of Adult Competencies (PIAAC)[2] goes a long way toward answering that question. Although previous studies[3] have examined the determinants of literacy and numeracy of different groups within Canada, very few have specifically analyzed the populations of the country's northern territories — Yukon, Northwest Territories, and Nunavut. Here we look at literacy and numeracy results for the region, with the aim of identifying the key factors contributing to the development of these skills.

Characteristics of the northern territories

Canada is a large country, and nowhere is this more evident than in its northern territories. The land mass of the northern territories is vast, and the population is small. Much of this population is concentrated in three urban areas: Whitehorse, with more than three-quarters of Yukon's population; Yellowknife, with about half of the population of Northwest Territories; and Iqaluit, which is home to about one-fifth of the population of Nunavut.

Aboriginal people make up a large proportion of the population of the territories: over 80 per cent of the population of Nunavut, about half of the population of Northwest Territories, and about 20 per cent of the population of Yukon are Aboriginal. Aboriginal people are also more likely than non-Aboriginal people to live in small, remote, and rural communities.

The population in the territories is comparatively young. While the median age in Yukon is close to 40 years, in Northwest Territories it is almost seven years lower, and in Nunavut the median age is 24 years.

There is considerable linguistic diversity in the territories; many Aboriginal languages are spoken there: Nunavut's *Official Languages Act* recognizes Inuktitut, Inuinnaqtun, English, and French as its official languages; Northwest Territories has 11 official languages, nine of which are Aboriginal; and Yukon's *Language Act* recognizes the significance of Aboriginal languages in Yukon, but only English and French are considered official when it comes to laws, court proceedings, and Legislative Assembly proceedings. Not surprisingly, significant proportions of the adult populations (those aged 15 and over) have neither English nor French as their mother tongue — ranging from approximately 12 per cent in Yukon to about 70 per cent in Nunavut. Furthermore, over a quarter of the Nunavut's population seldom uses either English or French at work. It should also be noted that PIAAC was administered in Canada's two official languages, English and French, which, in light of this linguistic diversity, could be expected to have had some negative influences on literacy and numeracy results in the territories.

Table 1 – Contextual statistics for the territories

Median age of population	Yukon	Northwest Territories	Nunavut
Median age in years	39.1	32.3	24.1

Source: Canada Census 2011

Characteristics of population aged 15 years and over	Yukon	Northwest Territories	Nunavut
Proportion of population living in the capital cities (all ages)*	76.7%	46.2%	21.1%
Proportion of population identifying as Aboriginal	21.0%	47.6%	81.9%
Proportion of population identifying as Aboriginal living in the capital cities*	13.8%	21.5%	--
Proportion of population identifying as Aboriginal with a high-school diploma or equivalent or above	77.1%	63.0%	35.7%
Proportion of population identifying as Aboriginal with neither English nor French as a mother tongue	12.3%	23.0%	70.2%
Proportion of population identifying as Aboriginal using neither English nor French most often at home	3.0%	9.1%	51.0%
Proportion of workers identifying as Aboriginal using neither English nor French most often at work **	0.4%	1.4%	26.5%

Source: Statistics Canada. National Household Survey, 2011.

* The available NHS tables do not provide data that contain both Aboriginal identity and indicators for Iqaluit.

** Workers are those who had been working since 2010 prior to being surveyed.

Levels of education vary considerably across the territories. In Yukon, 77 per cent of the adult Aboriginal population has completed high school, whereas in Northwest Territories, this proportion falls to 63 per cent, and in Nunavut to about 36 per cent. These proportions must be placed in the historical context of education in the territories. For example, all three territories had Residential Schools,[4] which negatively impacted the overall educational outcomes for many Aboriginal people or their parents who may have lived in the territories during the period when they were in place.

How do literacy and numeracy skills vary with key characteristics in the territories?

Higher Aboriginal identification and lower educational attainment are two prime characteristics of the territories. Descriptive analyses of the variations in literacy and numeracy skills between Aboriginal people and non-Aboriginal people, as well as between individuals with different levels of education, offer initial insights into the factors that influence skills proficiency.

Among these results, two findings stand out.

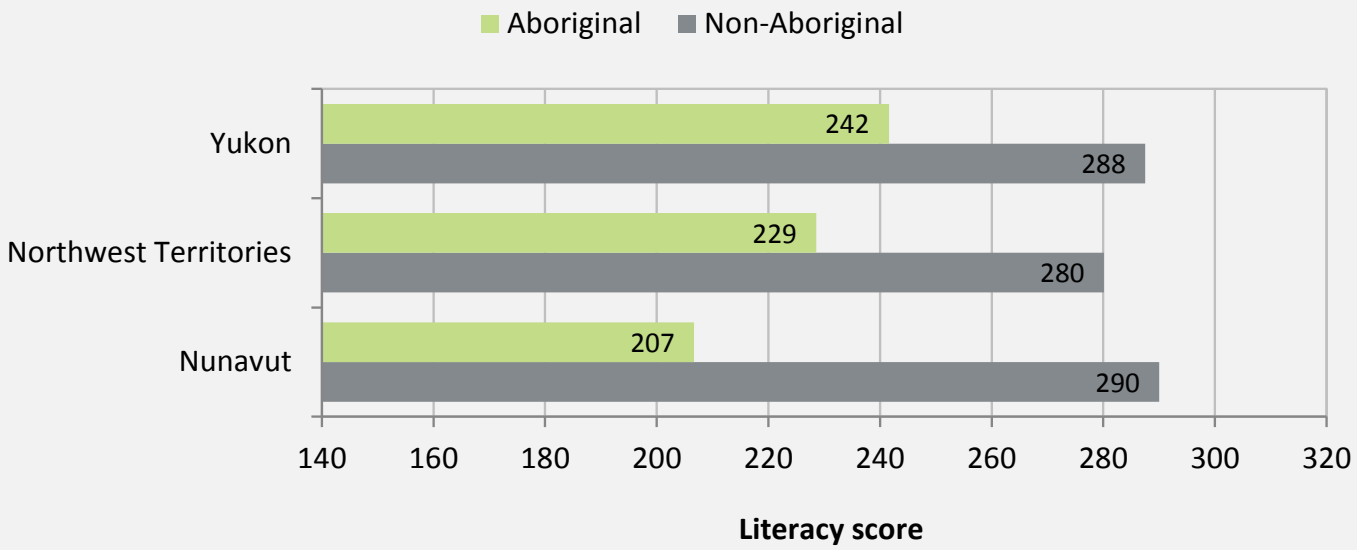
Aboriginal people have lower proficiency in literacy and numeracy than non-Aboriginal people

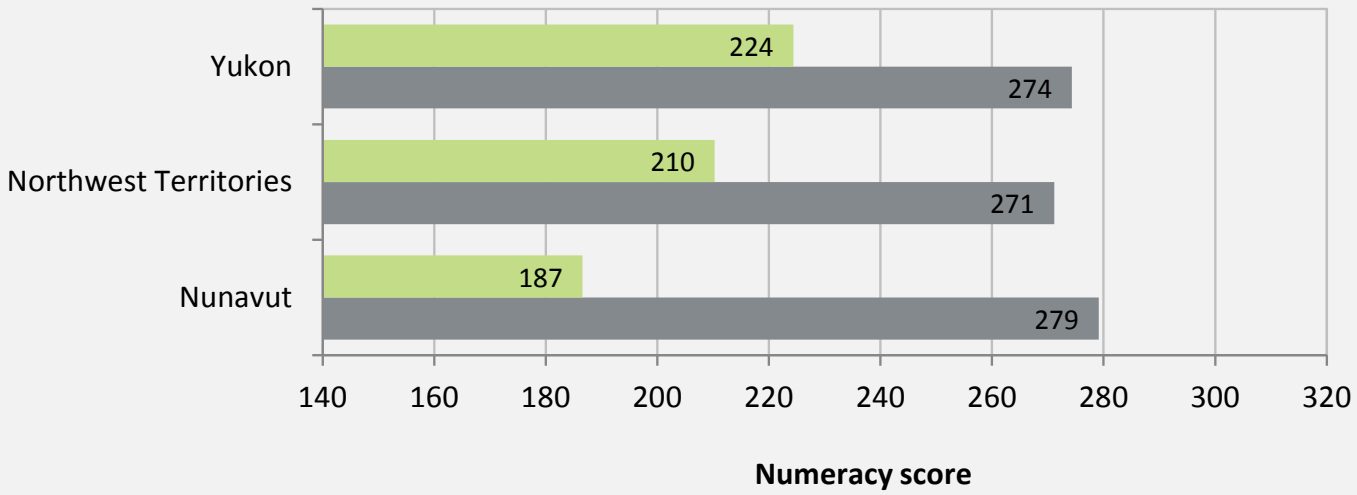
In each territory, Aboriginal people show lower average scores in literacy and numeracy than non-Aboriginal people, with the greatest differences observed in Nunavut. Average scores in literacy are higher than those for numeracy, which is the case for both Aboriginal and non-Aboriginal people across the three territories. On average, Aboriginal people in Yukon and Northwest Territories perform at Level 2[5] in literacy, and their counterparts in Nunavut at Level 1.[6] Yet in numeracy, Aboriginal people on average perform at Level 1 across the three territories. Furthermore, average proficiency among non-Aboriginal people tends to be fairly uniform across the three territories, whereas the same is not true among Aboriginal populations: for example, the average numeracy score of Aboriginal people in Yukon is about 37 points higher than it is in Nunavut (Chart 1).

Individuals with higher levels of education demonstrate higher literacy and numeracy skills

As is the case elsewhere, literacy and numeracy are positively associated with educational attainment in each territory. The average scores for a given level of education vary across the territories. For example, in numeracy, individuals with a level of education below high school in Yukon score, on average, at Level 2, similarly educated individuals in Northwest Territories at Level 1, and those in Nunavut below Level 1.[7] However, it is worth noting that individuals with a bachelor's degree or above in each territory have an average score in the range of Level 3[8] in both literacy and numeracy (Chart 2).

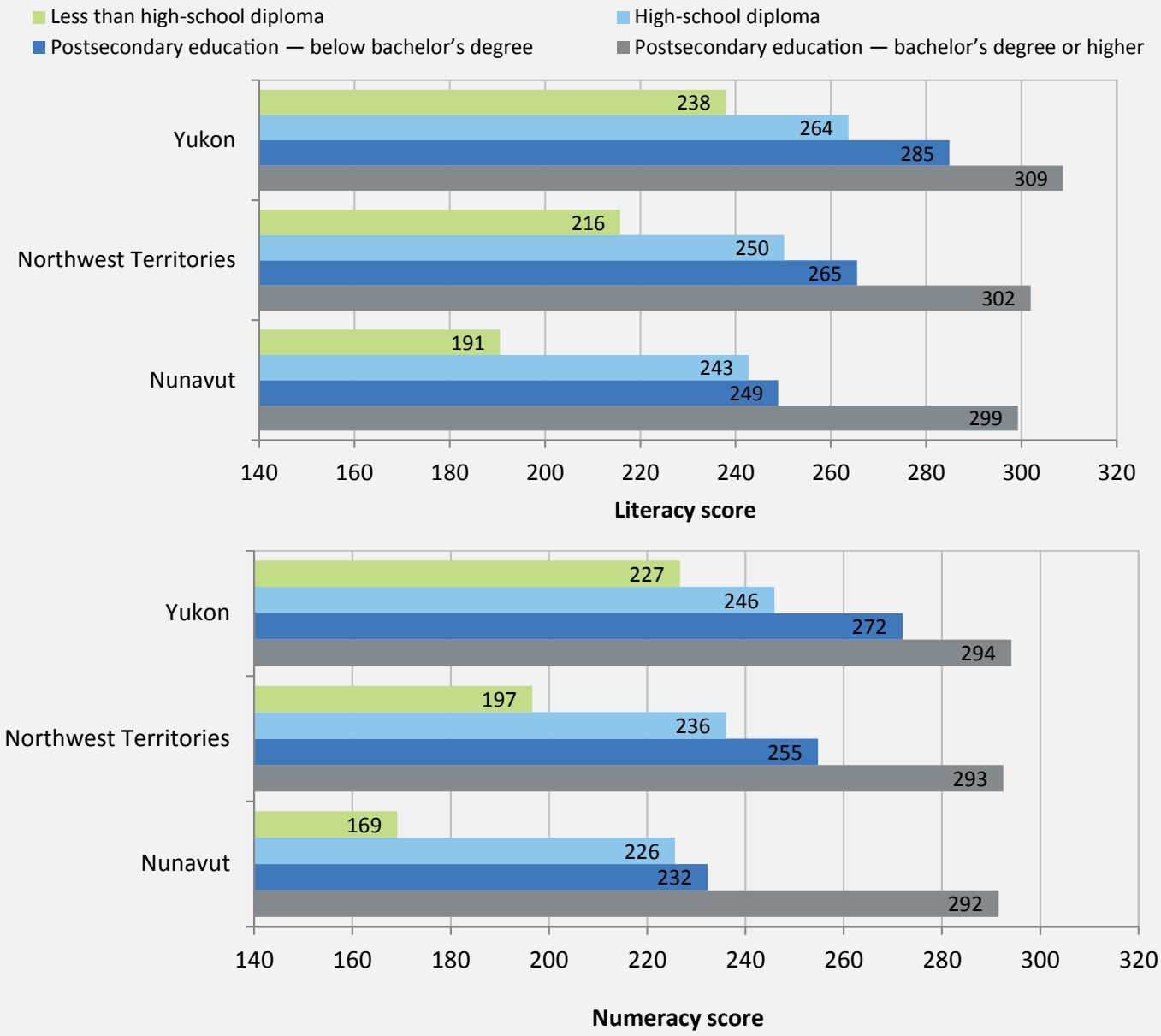
Chart 1 – Average scores in literacy and numeracy of population aged 16 to 65 across the territories, Aboriginal and non-Aboriginal populations





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

Chart 2 – Average scores in literacy and numeracy of population aged 16 to 65 across the territories, by educational attainment levels



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

Education is key to developing literacy and numeracy skills

To identify the key determinants of literacy and numeracy, it is important to take into account the impacts of different factors that may also be associated with these skills. To do so, we use the multivariate regression approach (Box 1).

BOX 1

MULTIVARIATE REGRESSION ANALYSIS EXPLAINED

Using the multivariate regression analysis, we examine the relationships between literacy and numeracy proficiency and various factors such as Aboriginal identification and educational attainment.[9]

Previous studies[10] on the determinants of skills considered a number of factors[11] to be associated with literacy and numeracy skills. To conduct our multivariate regression analysis, literacy or numeracy scores are regressed on a set of explanatory variables, which are gender, work experience, language used most often at work, Aboriginal identity, individuals' education level, parental education level, participation in adult education and training, immigrant status, and territory of residence.

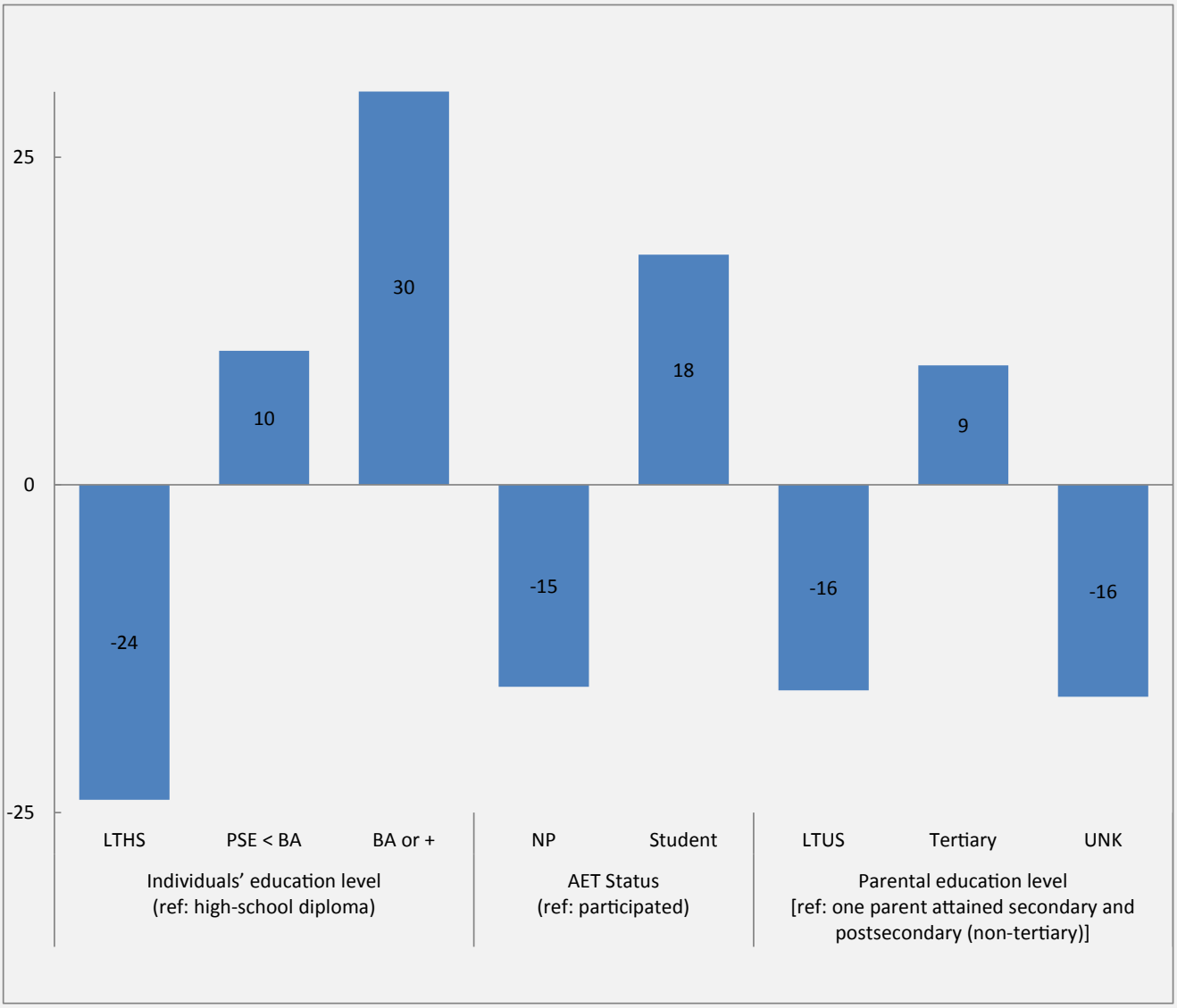
The analysis is conducted for the three territories taken as a whole in order to have sufficient data variations and avoid problems associated with a smaller sample size.

The results of the regression analysis point to education as the key to developing literacy and numeracy skills (Table 2). This becomes much more evident when we look at Chart 3, which presents the associations between literacy scores and three education-related variables:[12] individuals' education level, participation in adult education and training (AET), and parental education level. The first set of scores, for example, shows that when compared with individuals with a high-school diploma, individuals with a bachelor's degree or higher score about 30[13] points higher in literacy; those with postsecondary education (PSE) below a bachelor's degree score about 10[14] points higher; and those with less than a high-school diploma score about 24 points lower. Chart 3 also shows that participation in AET and having a parent with a higher level of education are related to higher scores in literacy. Among the impacts associated with these three education-related factors, the greatest positive impact is seen in individuals with a bachelor's degree or higher.

In addition, the results from the regression analysis (Table 2) indicate that even when education and other factors, including language, are taken into account, Aboriginal people score lower in both literacy and numeracy than non-Aboriginal people. This is consistent with the findings from the descriptive analysis shown in Chart 1. All of the other explanatory variables have the expected association with literacy and numeracy skills.

In summary, in the three territories, higher levels of education, participation in adult education and training, and higher levels of parental education are all positively associated with foundational skills. Also, the literacy and numeracy skills of Aboriginal people are lower than those of non-Aboriginal people. Hence, ensuring access to formal education and to adult education and training is essential to enable Canadians living in the territories to acquire necessary literacy and numeracy skills.

Chart 3 - Differences in literacy scores compared to respective reference groups by education-related variable



Source: Estimates based on the Programme for the International Assessment of Adult Competencies, 2012. See Table 2.
Notes: AET = Adult Education and Training. LTHS = less than high-school diploma; NP = has not participated in AET; UNK = unknown; LTUS = less than upper secondary (more or less corresponding to less than a high-school graduate); BA = bachelor's degree; PSE = postsecondary education; and tertiary is more or less equivalent to college/cégep or university education. For the correspondence of Canadian terms to the International Standard Classification of Education (ISCED), see *Education Indicators in Canada: An International Perspective 2013*. Furthermore, differences in literacy scores are adjusted for a set of variables that include gender, work experience, territory of residence, language most often used at work, immigrant status, and Aboriginal status, along with two education-related variables, namely, if the differences in literacy scores are associated with individuals' education level, then the two education-related variables refer to the variables representing AET status and the highest parental education level separately; if the differences in literacy scores are associated with AET status, then the two education-related variables refer to the variables representing individuals' education level and the highest parental education level separately; and if the differences in literacy scores are associated with parental education level, then the two education-related variables refer to the variables representing individuals' education level and AET status.

Table 2 – Literacy and numeracy score regressions for the three territories

	Literacy			Numeracy		
	Coeff.		Std. Err.	Coeff.		Std. Err.
Education level (ref: high-school diploma)						
Less than high-school diploma	-24.02	*	5.92	-23.76	*	6.84
PSE below bachelor's degree	10.23	*	4.97	12.25		6.47
PSE: bachelor's degree or higher	30.28	*	6.11	31.35	*	6.89
Aboriginal status (ref: non-Aboriginal)						
Aboriginal	-25.88	*	6.38	-28.11	*	6.79
Immigrant status (ref: Canadian-born)						
Recent immigrant (10 years or fewer)	-10.45		23.81	-7.66		25.96
Established immigrant (more than 10 years)	-13.10		7.21	-8.86		8.36
Unknown	-34.45		30.55	-25.81		30.45
AET status (ref: participated in formal/non-formal AET within 12 preceding months)						
Did not participate in formal/non-formal AET	-15.42	*	4.77	-16.18	*	5.85
Students in regular cycle of studies	17.57	*	7.11	22.45	*	7.62
Parental education level [ref: one parent attained secondary and postsecondary (non-tertiary)]						
Neither parent has attained upper secondary	-15.68	*	4.77	-19.18	*	6.35
At least one parent has attained tertiary	9.12	*	7.11	12.49	*	5.89
Unknown	-16.17	*	5.01	-15.30	*	5.88
Region (ref: Northwest Territories)						
Yukon	8.54		13.57	5.63		11.49
Nunavut	-4.66		6.47	-6.78		7.51
Language used most often at work (ref: English or French or both)						
Neither English nor French	-10.10		6.35	-9.41		6.67
Does not work or work language unknown	-9.84		5.69	-14.99	*	6.27
Years of actual work experience						
Years of actual full-time work experience	0.78		0.60	1.18		0.68
Years of actual full-time work experience squared/100	-1.43		1.46	-2.15		1.53
Gender (ref: male)						
Female	-1.77		3.52	-10.94	*	4.20
CONSTANT	271.89	*	8.61	259.83	*	10.03
No. of observations	2,419			2,419		

Source: Estimates based on the Programme for the International Assessment of Adult Competencies, 2012, and the PIAAC SAS Macro version 2.0.

Notes: AET = Adult Education Training; *significant at 5 per cent; Std. Err. = standard error; Coeff. = coefficient.

[1] See *OECD Skills Outlook 2013* at http://skills.oecd.org/skillsoutlook.html. For results on the association between skills and labour-force status in provinces and territories, see Appendix Table D.6 of the pan-Canadian PIAAC report at http://piaac.ca/docs/PIAAC2013/Annex-D_new-tablesEN.pdf.

[2] For more information on PIAAC, see www.piaac.ca.

[3] For example, Charette, M. & Meng, R. (1998). The Determinants of Literacy and Numeracy and the Effect of Literacy and Numeracy on Labour Market Outcomes. *Canadian Journal of Economics*, *31*, 495–517; Desjardins, R. (2003). Determinants of Literacy Proficiency: A Lifelong-Lifewide Learning Perspective. *International Journal of Educational Research*, *39*, 205–245; Willms J.D. & Watson, B. (2008). *Determinants of adult literacy and numeracy of the working age population in Canada*. Willms, J.D. & Watson, B. (2008). *Literacy, numeracy and problem-solving skills of Canadian youth*.

[4] See *They Came for the Children: Canada, Aboriginal Peoples, and Residential Schools* (2012), The Truth and Reconciliation Commission of Canada, at http://www.myrobust.com/websites/trcinstitution/File/2039_T&R_eng_web%5B1%5D.pdf.

[5] The score interval for Level 2 is from 226 points to less than 276 points. See the pan-Canadian PIAAC report at http://www.cmec.ca/Publications/Lists/Publications/Attachments/315/Canadian-PIAAC-Report.EN.pdf for a description of proficiency levels.

[6] The score interval for Level 1 is from 176 points to less than 226 points. See the pan-Canadian PIAAC report at http://www.cmec.ca/Publications/Lists/Publications/Attachments/315/Canadian-PIAAC-Report.EN.pdf for a description of proficiency levels.

[7] The score interval for below Level 1 is from 0 point to less than 176 points. See the pan-Canadian PIAAC report at http://www.cmec.ca/Publications/Lists/Publications/Attachments/315/Canadian-PIAAC-Report.EN.pdf for a description of proficiency levels.

[8] The score interval for Level 3 is from 276 points to less than 326 points. See the pan-Canadian PIAAC report at http://www.cmec.ca/Publications/Lists/Publications/Attachments/315/Canadian-PIAAC-Report.EN.pdf for a description of proficiency levels.

[9] Note that the regression analysis does not attempt to identify causal relationships.

[10] See Endnote 3.

[11] The factors considered depend on the survey upon which the study is based. These factors include gender, age/work experience, educational attainment, parental education, official-language use, immigration-related factors, and whether an individual has good math grades. When work experience is not available in the data, age is used as a substitute. In this issue of *In Focus*, age is not used because actual work experience is available.

[12] The associations between education-related variables and numeracy scores are similar to those for literacy shown in Chart 3.

[13] This accounts for 60 per cent of the range of scores for a given level. Note that for Levels 1 to 4 in literacy and numeracy, the score range of each level is 50 points.

[14] Note that there is no statistically significant numeracy advantage for individuals with PSE below a bachelor's degree relative to high-school graduates.

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