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Aboriginal Communities:
An analysis of the Aboriginal Peoples' Surveys**

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Explaining low high school attainment in Northern Aboriginal Communities:
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Abstract

Within the off-reserve Canadian Aboriginal population, high school graduation rates are about 45 percent lower in Northern communities (North) than the rest of Canada (South). Using data from the Aboriginal Peoples' Surveys, we document that economic incentives do not appear to be important in explaining the North-South gap in graduation rates. We then consider individual-specific and schooling-related determinants of high school graduation and find that these factors can explain between 31 percent and 59 percent of the gap in the probability of graduation in 2000/2005. Further, much of the gap is attributable to a respondent speaking/understanding or being taught an Aboriginal language. We discuss the possible implications of these results for language and curricular programming in the North.

1. Introduction

Within off-reserve Aboriginal populations in Canada, in 2000 (2005) only 25 percent (28 percent) of 18-32 year olds had completed high school in Northern communities (Nunavut, the Northwest Territories (NWT), the Yukon, Nunavik in the province of Québec and the Inuit settlement region of Nunatsiavut within Labrador) compared to 70 percent (73 percent) in the rest of Canada (Statistics Canada (2000, 2005)). This paper examines the factors causing high school graduation rates among Aboriginal individuals in Northern communities (North) to differ so dramatically from those in the rest of Canada (South); and in doing so, may aid in designing policies for increasing high school graduation rates in the North.

Understanding these factors is important for a number of reasons. First, a large proportion of Northern communities are currently transitioning through the education system. Indeed, Northern communities are the youngest in Canada due to high birth rates in the region than the rest of Canada.¹ Second, given the recent surge in interest in the Arctic due to the pace of climate change, sovereignty issues and increased resource exploration, demand for skilled labour is strong across the North. If local inhabitants are to obtain such skilled positions, a high school diploma is essential.

A number of studies have analyzed the barriers to Aboriginal education in Canada, and Northern communities have received particular attention within this literature (Atleo and Fitznor, 2010; Aylward, 2010; Battiste and Henderson, 2009; Battiste et al. 2010; Berger, 2001; Berger et al., 2005; Berger, 2009). Within this largely qualitative literature, the dominant hypothesis put forward is that of ‘cultural discontinuity’, which asserts that “prior cultural socialization influences how students learn in the school system, in particular how they negotiate, mediate, and respond to curriculum, instructional strategies, learning tasks, and communication patterns in the classroom” (Kanu, 2007, 24). According to this hypothesis, discontinuity between a child’s home culture and the culture of their school and teachers leads to learning difficulties and to a lower probability of high school graduation. Emphasis in this literature, and to some extent in practice, has thus been on the need for culturally responsive school curricula, Aboriginal language instruction and Aboriginal educators in Canadian high schools.

There is also a significant literature in economics examining quantitatively the determinants of high school completion (Angrist and Lavy, 2002; Dearden et al., 2005; Eckstein and Wolpin, 1999; Guryan, 2004; Kremer, Miguel and Thornton, 2005; Lamb, 2014). To evaluate the importance of different factors associated with dropping out of school, Lamb (2014) uses the 2000 Aboriginal Peoples’ Survey (APS) to examine differences between Aboriginal people living on- and off-reserve. She finds that most of the difference in dropout rates between the two groups is attributable to observable characteristics.

We use data for individuals living off-reserve from the 2000 and 2005 APS to examine the importance of economic incentives, individual-specific factors (residential school, health, among others) and school-related factors (culturally-relevant curriculum and Aboriginal teachers) in explaining the difference in high school graduation rates between the North and the South. By examining reasons for inter-regional differences in the probability of high school graduation, and by incorporating data from the 2005 APS, we provide additional insights into the determinants of high school graduation for the

¹ For example, approximately half of Inuit are under the age of 20, and 25% are below 10 years old (Statistics Canada, 2005).

Canadian Aboriginal population. We also evaluate the importance of the recent emphasis on culturally-relevant curricula and language programming in off-reserve schools for high school graduation.

We begin our examination of the determinants of the North-South gap in high school graduation by investigating whether there are differences in economic incentives for high school graduation between the two regions. Using data from the APS, we examine differences in unemployment rates and earnings for Aboriginal high school graduates and non-graduates, and find that Northern high school graduates have significantly lower unemployment rates relative to their Southern counterparts. Further, high school graduates in the North have a significantly higher earnings premium relative to graduates in the South. These findings suggest that differences in economic incentives between the two regions may not be the reason for lower high school graduation rates in the North relative to the South.

We then examine differences between the North and the South in other factors thought to be important determinants of high school graduation for the age group 18-32 years old. We chose to restrict our analysis to those 18 and above, as 18 years old is the most common age to graduate from high school across Canada.² Further, as the age group 18-32 is relatively young, they would have experienced the educational policy changes introduced in the North over the last couple of decades (discussed in the next section). We divide this age group into two, to investigate if there are significant differences in the determinants of graduation between those attending high school in the 1990s (18-25 year olds in APS 2000 and 26-32 year olds in APS 2005) and the late 1990s/early 2000s (18-25 year olds in APS 2005).

The APS provides data on individual-specific and school-related factors that have been identified in qualitative studies as important in determining high school completion (see for example, Lee and Burkham, 2003). For the two age groups, we estimate probit regression models to quantify the importance of these variables in explaining the gap in the probability of high school graduation between the North and the South. Further, we undertake an Oaxaca-Blinder decomposition to determine the extent to which individual-specific and school-related factors can explain the large inter-regional gap in the probability of high school graduation.

We find that both individual-specific and school-related variables account for a significant fraction of the North-South gap in the probability of graduation. The estimated average marginal effects for the variables are qualitatively similar for both age groups. However the results suggest that the variables we consider can explain more of the North-South gap in high school graduation rates for the age groups most affected by rapid educational change in the North in the 1990s (18-25 year olds in 2000 and 26-32 in 2005) relative to the other age groups. The Oaxaca-Blinder decompositions suggest that, depending on the age group we consider, the variables that we consider can explain between 38 percent and 59 percent of the graduation gap in the year 2000, and between 31 percent and 44 percent of the gap for 2005.

Our study is the first to empirically examine how the incorporation of Aboriginal culture and language and the presence of Aboriginal teachers in high schools may contribute to the North-South gap

² To examine the robustness of our results, we used different age cutoffs and found that the results were qualitatively and quantitatively similar.

in the probability of high school graduation. While the education literature cited above has, qualitatively, identified important factors leading to early high school exit in Northern communities, our analysis allows us to examine the quantitative importance of the various factors put forward. For instance, our analysis suggests that while being taught about Aboriginal peoples and history is positively associated with high school graduation, being taught an Aboriginal language is negatively related to it. In particular, our findings could suggest that additional supports are needed when incorporating Aboriginal languages into school curricula in Northern Canadian communities.

In the next section we discuss trends in Aboriginal education in Canada over the past 40 years. Section 3 introduces the APS data. In Section 4 we examine the differences in the economic incentives for graduating from high school between the North and the South. Section 5 describes individual-specific and school-related variables in the APS that could influence the decision to graduate from high school. Our regression results and the decomposition of the gap in high school attainment between the two regions are presented in Section 6. Section 7 concludes and offers policy recommendations based on our results.

2. Trends in Aboriginal Education in Canada

The importance of culturally relevant curricula and Aboriginal language instruction has been the central focus of Aboriginal education policy since the ‘Indian Control of Indian Education’ paper was published by the National Indian Brotherhood (now the Assembly of First Nations (AFN)) in 1972 (National Indian Brotherhood, 1972). This paper emphasized the need for greater Aboriginal responsibility for the administration of schools and curriculum development, the need for Aboriginal teachers, and improvements in school facilities. The Federal Government accepted these principles as the basis for educational reform in Aboriginal communities. In this section we discuss the historical impetus for a culturally-relevant curriculum and Aboriginal language instruction in Canada, and why they are thought to be important for Aboriginal educational success. While these initiatives have generally focused on on-reserve schools, they have influenced programming in off-reserve schools, which is the focus of our study.

2.1. Culturally-relevant Curriculum

It is widely recognized that school curricula that reflects the history, traditions, worldviews and culture of one’s ancestors builds self-esteem and a strong sense of identity, which in turn bolsters learning (Berry, 1999). Although Aboriginal peoples across Canada differ in their history, traditions, worldview and culture, Aboriginal education rests to a greater extent on philosophical/spiritual grounds, whereas mainstream Canadian curricula has tended to view spirituality as a private matter.³

Schools across Canada are currently at various stages of adopting culturally-relevant pedagogy and curriculum, both on- and off-reserve. In 2011, approximately 92 percent of on-reserve schools have

³ As noted in National Indian Brotherhood (1972): “We want education to provide the setting in which our children can develop the fundamental attitudes and values which have an honoured place in Indian tradition and culture. The values which we want to pass on to our children, values which make our people a great race, are not written in any book. They are found in our history, in our legends and in the culture. We believe that if an Indian child is fully aware of the importance of Indian values, he will have reason to be proud of our race and of himself as an Indian” (page 2).

partially integrated Aboriginal cultural teachings into their curriculum whereas only 26 percent of off-reserve schools have fully integrated cultural teachings into their curriculum (AFN School Survey, 2011).

Approximately 80 percent of Aboriginal children attend provincial (off-reserve) schools (Richards and Scott, 2009). Provincial schools have been slow to revamp school curricula to represent the Aboriginal students they teach. Especially for Aboriginal students who move from on-reserve communities to attend off-reserve schools, the lack of Aboriginal culture and tradition in school curricula and among their teachers has been identified as a key determinant of low rates of high school completion (Brady, 1995). A study of inner-city students and dropouts in Winnipeg found that some Native Studies courses become cursory histories of Aboriginal Peoples that do little to help Aboriginal students understand their background: “Aboriginal students consider some cultural programs offered in some schools to be lip service or window-dressing. A pow-wow club after 3:30 or a sharing circle every now and then does not, it appears, satisfy what we believe to be the genuine craving of many Aboriginal youth to “know themselves”” (Silver et al., 2002, page 21).

More recently Provincial schools have begun working with Aboriginal communities to develop curriculum. The Western and Northern Canadian Protocol (WNCP) is a collaboration between Manitoba, Saskatchewan, Alberta, British Columbia and the three Territories to develop a common curriculum in line with Aboriginal values and teachings. Schools with large Aboriginal populations have also made more of an effort to make curricula culturally relevant. For example, Children of the Earth, a high school in Winnipeg’s North end, considers it part of its mandate to incorporate Aboriginal values and traditions into all school activities.

Schools in the Northern Territories of the Yukon, the Northwest Territories and Nunavut, however, experience greater freedom to incorporate Aboriginal worldviews into curricula. McGregor (2013) suggests that this is due to the numerical strength of Inuit students in northern schools relative to Aboriginal students in schools in the South, so that “public schools in the Arctic could move in the direction of respecting and recognizing Inuit language and culture with fewer constraints” (page 96). This is especially the case in Nunavut, where the curriculum is based on Inuit Qaujimajatuqangit, which stands for Inuit societal values.

2.2. Incorporation of Aboriginal Languages in Schools

Similar to the recognition that Aboriginal children must learn the history and customs of their peoples, so too is knowledge of an Aboriginal language thought to be important for children’s cognitive development. The AFN (1990) commented that “language is our unique relationship to the Creator, our attitudes, beliefs, values and fundamental notions of what is truth. Our languages are the cornerstones of who we are as a people. Without our languages our cultures cannot survive... The right to use our Aboriginal languages, and the right to educate our children in our languages, is an inherent Aboriginal and treaty right.” (AFN, 1990, 39).

Fettes (1998) estimates that there are up to 70 distinct Aboriginal languages across Canada. However language strength differs greatly across the country, with Cree and Inuktitut flourishing in many communities while other languages are near extinction. There has been an acceleration of

language programs since 1985, as language rights came to the fore due to the debate over the 1982 Constitution (Fettes, 1998, 123). As of 2011, approximately 88 percent of Aboriginal schools (on-reserve) offered some type of Indigenous language programming, and only 17 percent offered Indigenous language immersion programming (AFN School Survey, 2011).

Aboriginal language instruction was also emphasized by the National Indian Brotherhood (1972), stating that: “pre-school and primary school classes should be taught in the language of the community” for four to five years, and that “transition to English or French as a second language should be introduced only after the child has a strong grasp of his own language” (National Indian Brotherhood, 1972, page 43). Despite this call, regular instruction in an Aboriginal language medium has only been provided in Nunavik (northern Quebec) and Nunavut (previously the Eastern Northwest Territories), and only for the first few years of schooling. In Nunavik, Inuktitut has been the language of instruction from kindergarten to Grade 2. Grade 3 is taught half in English and half in Inuktitut, while from Grade 4 onwards, classes are taught in English or French. In many Nunavut communities, children are educated in Inuktitut/Innuinaqtun until grade 3.⁴

In our analysis below, we investigate whether the curriculum and language initiatives discussed above are important for explaining the difference the North-South graduation gap, or whether individual-specific factors are more important.

3. The Aboriginal Peoples Surveys

The Aboriginal Peoples’ Surveys (APS), a post-census survey, provides individual-level data on the social and economic conditions (for example, health, language, employment, income, schooling, housing, and mobility) for Aboriginal individuals aged 15 and over. It is the only source of data for Canadian Aboriginal individuals with information on curriculum-related and cultural variables, and hence is ideal for analyzing the determinants of high school graduation. We investigate the factors contributing to educational attainment in the North relative to the South using micro-data from the 2000 and 2005 APS for the off-reserve population (Statistics Canada, 2000 and 2005).⁵

The North includes Nunavut, the Northwest Territories, the Yukon, Nunavik in the province of Québec and the Inuit settlement region of Nunatsiavut within Labrador and the rest of the regions are included in the South.⁶ While 2.6 percent of the total Aboriginal population in Canada lives in the North, the percentage for the younger age group - 18-32 years old - is 3.1 percent (Statistics Canada, 2000 and 2005).⁷ As noted above, we restrict our analysis to individuals aged between 18 and 32 years old to gain insight into the determinants of high school completion for a relatively young cohort that would be affected by recent changes in educational curricula.

⁴ Only the Northwest Territories and the Yukon received regular funding for language programs through Federal-Territorial funding agreements (the Indigenous Language Development Fund and Canada-Yukon Language Agreement respectively). Across the rest of the country, provinces received piecemeal Federal funding of individual projects, which meant that other Aboriginal communities developed their language programs without stable financial support (Phillips, 1985).

⁵ Micro-data from the Aboriginal Peoples’ Surveys was accessed through the Manitoba Research Data Centre (RDC).

⁶ Our definition of the North and South is the same as that in Lamb (2014).

⁷ The APS over-samples the North population and therefore there are more observations for this region. For example, for the 18-32 year old age group, the North accounts for 12.4 percent of total observations but only approximately 3 percent of the population (weighted sample) in the APS 2005 data.

There are large differences in high school graduation rates between the North and the South for 2000 and 2005 (Table 1).⁸ We find that over the period from 2000 to 2005, both regions experienced increases in the proportion of individuals that have graduated from high school. However, for both age groups, the gap in high school completion between the North and the South remained fairly constant (at about 45 percent) over the period 2000-2005. In other words, over the five-year period 2000-2005, there is no evidence of catch-up in high school attainment for the North.

We began our exploration of the determinants of the differences in graduation rates between the two regions by examining the reasons cited by respondents in the APS for dropping out of high school.⁹ However, there were no systematic patterns that could explain the large gap in high school graduation rates between the two regions. In what follows, we use data from the APS to examine whether economic incentives, individual-specific factors and/or school-related factors are important for explaining the difference in the graduation rates between the North and the South.

Table 1: Percentage of Respondents that have graduated from high school

	Age group 18-25		Age group 26-32	
	2000	2005	2000	2005
South	71.4	74.3	69.1	72.1
North	27.2	30.1	23.4	26.3

Source: Author computation using data from 2000 and 2005 APS (Statistics Canada 2000, 2005).

4. Economic Incentives for Completing a High School Education

A reason for the lower rate of high school completion in the North could be lower economic incentives in the region: if there are lower returns to a high school degree, dropping out could be a rational economic decision. To determine whether there are lower incentives for completing high school in the North, we use data from the APS to examine differences in unemployment rates and earnings for high school graduates and non-graduates between the North and the South.

4.1. Earnings

To determine differences in the economic returns to a high school education between the two regions and time periods, we use data from the APS to estimate the following regression equation:

$$\ln(Earnings_{ijt}) = \alpha_0 + \alpha_1 t_{2005} + \alpha_2 North + \alpha_3 North * t_{2005} + \beta_0 grad + \beta_1 grad * t_{2005} + \beta_2 North * grad + \beta_3 North * grad * t_{2005} + \gamma_0 AGE_{ijt} + \gamma_1 AGE_{ijt}^2 + \varepsilon_{ijt}$$

⁸ Sample weights provided in the APS are used for all tabulations and regression analysis.

⁹ This analysis is available upon request. Respondents of the APS were asked if any of the following explained their decision to dropout: if they wanted to or had to work, if they were bored in school, if they found school hard, if they left due to pregnancy, if they had to help at home or had problems at home, if they had a lack of access to schooling or ‘other’ (which combines reasons with lower frequencies).

For individual i , region j and time t , the dependent variable is the logarithm of earnings. The regression includes a dummy variable for the North ($North$), a dummy for the year 2005 (t_{2005}), a dummy variable for whether individual i graduated from high school or not ($grad$) and interactions between the variables. The estimated coefficient for $North$ provides the difference between the North and the South in 2000 and the estimates for t_{2005} and $North*t_{2005}$ provide the difference between 2000 and 2005 for the two regions. Following the literature estimating the returns to schooling, we include controls for experience and experience-squared by including age and age-squared as control variables.¹⁰

The results are provided in Table 2 below. Column 2 presents the results for the younger age group (18-32 year olds), while column 3 provides the results for the whole range of working age individuals (18-65 year olds). The results for the former age group provide a better estimate of post-graduate earnings expectations for respondents that we include in our analysis.

Table 2: Differences in Returns to High school graduation between the North and The South

Dependent variable: $\ln(Earnings)$		
Variable	Age 18-32	Age 18-65
t_{2005}	0.179	0.161
	(0.052)*	(0.031)*
$North$	-0.132	-0.045
	(0.060)	(0.035)
$North*t_{2005}$	-0.058	-0.028
	(0.087)	(0.051)
$grad$	0.274	0.327
	(0.045)*	(0.030)*
$grad*t_{2005}$	-0.013	0.001
	(0.061)	(0.038)
$North*grad$	0.195	0.167
	(0.092)**	(0.061)**
$North*grad*t_{2005}$	0.198	0.140
	(0.135)	(0.092)
Age	0.664	0.182
	(0.041)*	(0.005)*
Age ²	-0.011	-0.002
	(0.001)*	(0.000)*
constant	-0.446	5.791
	(0.514)	(0.093)*
Adjusted R ²	0.229	0.178

Note: Robust standard errors (Huber/White/sandwich estimate) standard errors below estimates. *,**,*** indicate significance at 1%, 5% and 10% levels, respectively. $North$ takes the value of 1 for Northern communities, 0 otherwise; $grad$ takes the value of 1 for a high school graduate, 0 otherwise; t_{2005} takes the value of 1 for year 2005, 0 otherwise.

¹⁰ A number of studies use a similar approach to estimate returns to schooling for a variety of contexts and time periods. For a recent study see Psacharopoulos and Patrinos (2004).

The positive and statistically significant estimate for *grad* indicates an earnings premium for high school graduates relative to non-graduates in 2000 of 27 percent (33 percent) for the 18-32 (18-65) year old group in the South. Further, the estimate for *North*grad* indicates that high school graduates in the North aged 18-32 (18-65) earned about 20 percent (17 percent) more than graduates in the South. The estimate for *North*grad*t₂₀₀₅* not being statistically significant indicates that the earnings premium for graduates in both the North and the South remained fairly constant over the 2000-2005 period. Hence we do not find evidence of lower incentives for high school graduation in the North given the higher estimated earnings premium for high school graduates in the North relative to the South.

4.2. Unemployment Rates

Next we examine differences in unemployment rates for Aboriginal high school graduates and non-graduates by estimating a regression equation with *unemployment*, a dummy variable that takes a value of 1 if the respondent is unemployed, as the dependent variable.¹¹ The results of the estimation for the 18-32 year old age group are reported in Table 3 below.

Table 3: Differences in Unemployment Rates for High School Graduates and Non-graduates between the North and the South (18-32 year olds)

Dependent variable: <i>unemployment</i>	
Variable	
<i>Constant</i>	0.167
	(0.010)
<i>t₂₀₀₅</i>	-0.009
	(0.020)
<i>North</i>	0.017
	(0.020)
<i>North* t₂₀₀₅</i>	0.038
	(0.030)
<i>grad</i>	-0.088
	(0.010)*
<i>grad* t₂₀₀₅</i>	0.021
	(0.020)
<i>North*grad</i>	0.018
	(0.020)
<i>North*grad* t₂₀₀₅</i>	-0.076
	(0.030)**

Note: Robust standard errors (Huber/White/sandwich estimate) standard errors below estimates. *,**,*** indicate significance at 1%, 5% and 10% levels, respectively. *North* takes the value of 1 for Northern communities, 0 otherwise; *grad* takes the value of 1 for a high school graduate, 0 otherwise; *t₂₀₀₅* takes the value of 1 for year 2005, 0 otherwise.

While the unemployment rate with no high school degree in the South was 16.7 percent (estimate for *constant*), the rate was 8.8 percent lower for high school graduates (estimate for *grad*). The estimate for

¹¹ The regression we estimate is the same as that for earnings, but without controls for experience.

*North*grad* not being statistically significant indicates that in 2000 the unemployment rate for high school graduates in the North was the same as that for graduates in the South. However, the negative and statistically significant estimate for *North*grad*t₂₀₀₅* indicates that the unemployment rate for graduates in the North dropped below that in the South over the period 2000-2005.

Lower unemployment rates for high school graduates in both regions suggest that it would be easier for graduates to obtain employment than high school dropouts. Further, the results indicate that the North has similar or lower unemployment rates for high school graduates relative to the South, therefore we find no evidence that relatively high Northern unemployment lowered incentives for completing high school.

In sum, our findings suggest that economic incentives seem to favour high school graduation, not only in terms of enabling individuals to find employment, but also in terms of providing a significant earnings premium after graduating from high school in the North relative to the South. The findings thus suggest that differences in economic incentives for graduating from high school are likely not important determinants for lower high school graduation rates in the North relative to the South.

5. Determinants of High School Graduation

The literature documents that high school completion occurs due to a large range of individual, family, socio-cultural and institutional influences (Lee and Burkham, 2003). We now explore the information on such factors that are available in the APS, and which may therefore serve as determinants of the difference in high school graduation rates between the North and the South. We identify and construct 9 categorical variables related to high school outcomes in the APS, which we classify into two groups: individual-specific variables and schooling-related variables.

Individual-specific variables concern factors that affect the individual respondent themselves. The APS provides data to construct 6 such variables. The first variable is *sex*, which takes the value of 1 for males; 0 for females. Recent anecdotal and empirical evidence (for example Gilmore, 2010) suggests that male students have been exiting high school early; hence this variable will allow us to examine whether sex is a significant factor associated with high school graduation for the Canadian Aboriginal population.

Using responses to questions on a respondent's language ability, we construct a variable for the ability to speak an Aboriginal language (*Speak_Ab_Lang*), with the variable taking on the value of 1 if respondent reported the ability to speak and understand an Aboriginal language, and 0 otherwise. Given the general lack of Aboriginal language immersion in schools across the country, it is likely that those who speak/understand an Aboriginal language in our sample learned this language when they were a young child. This could have interfered with their proficiency in English. Given that English is the medium of instruction in high school across Canada, speaking an Aboriginal language could be associated with academic difficulties (Barnes et al., 2005).¹² Hence, Aboriginal students' lack of ability

¹² As Barnes et al. (2005) explain: "academic subjects that involve higher order skills, such as analysis or evaluation, require facility in decontextualized use of language as an integrated and independent system. For example, to understand subjects such as geography, mathematics, or English literature, students require a language proficiency sufficient to understand complex concepts. This level of linguistic sophistication was likely difficult for many aboriginal students to attain in the

in English could have led to difficulties in school and dropout due to a lack of experience with the decontextualized use of language; and, similar to the findings of Guevremont and Kohen (2012), we expect *Speak_Ab_Lang* to be negatively associated with high school graduation.¹³

Aggregating information on the reported incidence of common diseases/conditions known to afflict children, we construct a summary variable for the health of a respondent (*Health* =1 if the respondent reported having any of these diseases/conditions in or before the age of 18 years; =0 otherwise).¹⁴ Many studies in the literature note an association between chronic health conditions and cognitive function, academic performance and eventual school dropout (Kearney, 2008). We hypothesize that the presence of a chronic health condition is negatively related to high school graduation.

To consider the effect of residential schools on high school graduation, we construct two variables: *Res_School_Attend*, which indicates whether the respondent attended a residential school and *Fam_Res_School_Attend*, which indicates whether any family member of the respondent attended a residential school.¹⁵ Barnes et al. (2005) document the many ways in which residential schools increased the risk of poor school performance for Aboriginal Peoples.¹⁶ Children attending these schools were removed from their homes, lived most of the year at school, usually far away from their homes and family members. They had to work, sometimes for many hours per day. Some students were physically, verbally or sexually abused. Such maltreatment is known to be disruptive to a student's attention, memory and problem-solving abilities (Barnes et al., 2005). Hence, we expect a respondent who attended a residential school or who has a family member who attended a residential school to be less likely to graduate from high school.

The last individual-specific variable we consider is *Not_Moved*, which takes a value of 1 if the respondent has lived in their home community their whole lives. Rumberger and Larson (1998) use the National Educational Longitudinal Survey and find that students who changed schools in high school were twice as likely to dropout of high school as students who did not change schools. Their findings suggest that student mobility could be an important determinant of high school completion. Southa et al. (2007) also find a correlation between high dropout rates and schools with high proportion of mobile students – students who have moved schools during their high school period. We therefore expect a respondent who has 'not moved' from their community to be more likely to have graduated from high school.¹⁷

residential school setting. Those aboriginal students lacking higher order language proficiency would likely find advanced cognitive and analytical skills difficult to master" (page 24).

¹³ Guevremont and Kohen (2012) found that speaking an Aboriginal language was associated with a lower likelihood of having completed high school for 20–34-year olds.

¹⁴ The chronic diseases we consider are: diabetes, asthma, chronic bronchitis, cancer, high blood pressure, heart problem, ulcer, hepatitis and tuberculosis. The APS provides data on the age at which the respondent was diagnosed with these chronic conditions.

¹⁵ Family members include: grandparents, parents, brothers and sisters.

¹⁶ First Nations children attended residential schools even prior to Confederation, and the majority of schools were closed in the early 1980s (Jones, 2014).

¹⁷ We do not include being employed and working in one's census division as independent variables in our regressions, as Lamb (2014) does. These are contemporaneous variables (indicating employment status and work location in 2000 and 2005) and so could not have influenced the decision to complete high school for a very large proportion of the population 18 and older.

Table 4 provides summary statistics for the individual-specific variables for the two regions and the two years of the APS. Relative to the South, a much larger percentage of respondents from the North understand and speak an Aboriginal language, and have lived in their community their whole lives. While more respondents in the North report that they attended a residential school relative to the South; the incidence of poor health conditions was lower in the North than in the South.

Table 4: Percentage of Respondents Answering ‘Yes’ to Individual-Specific Questions

Question (Variable)	Age 18-25				Age 26-32			
	South		North		South		North	
	2000	2005	2000	2005	2000	2005	2000	2005
Do you speak and understand an Aboriginal language? (<i>Speak_Ab_Lang</i>)	14.0	33.8	83.0	96.4	16.9	36.2	86.6	96.9
In school, did you have any chronic health conditions? (<i>Health</i>)	15.1	20.8	6.6	12.3	11.1	14.1	3.4	6.4
Did you attend residential school? (<i>Res_School_Attend</i>)	1.8	1.0	2.8	2.0	2.1	2.1	6.0	6.0
Did your family members attend residential school? (<i>Fam_Res_School_Attend</i>)	12.4	19.8	5.3	28.1	10.7	22.2	2.5	36.4
Have you lived in your community your whole life? (<i>Not_Moved</i>)	36.3	41.2	70.7	69.9	25.0	30.3	60.4	65.6

Source: Author computation using data from 2000 and 2005 APS (Statistics Canada 2000, 2005).

The schooling-related group of variables was constructed using responses to questions on whether the respondent was taught an Aboriginal language (*Taught_Ab_Lang*); whether the respondent was taught about Aboriginal culture and history (*Taught_About_Ab_Peoples*); and whether the respondent was taught by an Aboriginal teacher (*Ab_Teacher*) in high school.¹⁸

The indicator ‘*Ab_Teacher*’ captures the potential ‘role model’ effect that an Aboriginal teacher may have on Aboriginal youth. Provinces and territories across Canada have training programs specifically for Aboriginal teachers based on the assumption that Aboriginal teachers have a positive influence on Aboriginal students’ learning and commitment to school.¹⁹ We expect this variable to be positively related with high school graduation.

¹⁸ In her analysis using data from the 2000 APS, Lamb (2014) includes a variable indicating whether an individual believes that teachings in their school about First Nations were accurate. We do not include this variable in our analysis as it is not clear how this belief could influence high school graduation. However, we examined the robustness of our results to inclusion of this variable and found that, conditional on other variables that we consider, its relation to high school graduation was not statistically significant.

¹⁹ For example, Saskatchewan has the Northern Teacher Education Program (NORTEP); Ontario the Aboriginal Teacher Education Program at Queen’s University or the Native Teacher Education Program at Lakehead, and the Nunavut Teacher Education Program (NTEP) in Nunavut.

The other two school-related variables – *Taught_Ab_Lang* and *Taught_About_Ab_Peoples* – relate to the cultural content of the school curriculum. As discussed in Section 2, residential schools had the explicit purpose of denigrating Aboriginal children’s knowledge of their culture, language and customs. This is known to reduce childrens’ attachment to their schools and to be harmful to their learning (Royal Commission on Aboriginal Peoples, 1996; Miller, 1996). Further, learning about the history and contemporary practices of one’s people is thought to be crucial to identity formation (Maina, 1997). Identity formation is crucial to self-esteem, and self-esteem is important for academic success; hence curricula which have supported children’s culture have been found to bring about improved academic outcomes for children (Berry, 1999). In their evaluation of Aboriginal language programs, Bell et al. (2004) and Fulford et al. (2007) report positive outcomes in terms of graduation rates for 20 Aboriginal schools across Canada with language programs. We thus expect *Taught_Ab_Lang* and *Taught_About_Ab_Peoples* to be positively related with to high school graduation.

Table 5 provides the summary statistics for schooling-related variables between the two regions and over time. There are large inter-regional differences between two school-related variables. A much larger proportion of individuals were taught in an Aboriginal language and had an Aboriginal teacher in the North relative to the South in both years and for both age groups. While the proportion of respondents that were taught about Aboriginal history and culture in school is high for both regions, it is higher in the North than in the South for both years.

Table 5: Percentage of Respondents Answering ‘Yes’ to Schooling-Related Questions

Question (variable)	Age 18-25				Age 26-32			
	South		North		South		North	
	2000	2005	2000	2005	2000	2005	2000	2005
Were you taught an Aboriginal language in school? (<i>Taught_Ab_Lang</i>)	10.5	11.2	77.8	66.3	8.0	8.0	74.6	66.6
Were you taught about Aboriginal peoples and history in school? (<i>Taught_About_Ab_Peoples</i>)	72.5	55.8	78.9	73.2	66.7	49.9	74.7	71.5
Did you ever have an Aboriginal teacher? (<i>Ab_Teacher</i>)	24.6	24.0	79.0	71.0	17.1	17.1	74.3	67.2

Source: Author computation using data from 2000 and 2005 APS (Statistics Canada 2000, 2005).

6. Regression Results and Decomposition

To determine the importance of the variables of interest in explaining differences in high school attainment between Aboriginal Peoples in the North and the South, we estimate the following regression:

$$Grad_{ijt} = \alpha_0 + \alpha_1 t_{2005} + \alpha_2 North + \alpha_3 North * t_{2005} + X_{ijt} \beta + \varepsilon_{ijt}, \quad (1)$$

where the dependent variable *Grad* takes the value of 1 if respondent *i* in region *j* at time *t* attained high school; = 0 otherwise. The regression includes a dummy variable for the North (*North*), dummy for the year 2005 (t_{2005}) and an interaction variable ($North * t_{2005}$). The estimated coefficient for *North* provides the difference between the North and the South in 2000, while the estimates for t_{2005} and $North * t_{2005}$ provide the difference between 2000 and 2005 for the two regions. The matrix *X* represents the individual-specific and schooling-related variables discussed in the previous section and ε represents the i.i.d error term. Given that the individual-specific variables are largely chosen by the parents of the respondents when they were young children, and the school-related variables are chosen by the schools of the respondents, these variables are exogenous to the decision of the respondent to graduate from high school (*Grad*). Hence, endogeneity of the control variables is not a concern for our regression models.

For the two age groups, 18-25 and 26-32 years old, we estimate regression (1) using the probit model. The regression is first estimated without control variables and then the individual-specific and schooling-related variables discussed in Section 4 are included to determine how much of the difference in probability of graduating from high school can be accounted for by controlling for the effects of these variables. Table 6 below presents the average marginal effects computed using the estimates of the probit regression models for the two age groups.

The estimates without control variables provide the difference in the probability of graduating from high school between the two regions and over time. The probability of graduating in the North in 2000 is 39 percent (42 percent) lower than the South for the 18-25 (26-32) year old age group. Further, the estimate for $North * t_{2005}$ not being statistically significant for both age groups indicates that in the five-year period from 2000 to 2005, there was no change in the difference in the probability of graduation between the two regions.

The second column for each age group provides the estimation results for the probit regression models that include the variables of interest. The inclusion of these variables reduces the difference in probability of graduation between the North and the South to 20 percent, a reduction of 47 percent for the 18-25 year old age group, and to 25 percent, a reduction of 41 percent for the 26-32 year old age group. These results suggest that the individual-specific and schooling-related variables we consider can account for a significant fraction of the difference in graduation rates between the North and the South. In the next section we undertake an Oaxaca-Blinder decomposition to provide a more precise quantification of the magnitude of the difference that can be explained by these variables.

The average marginal effects and the statistical significance of the estimated coefficients for the control variables indicate their importance in explaining the probability of graduating from high school. For both age groups, the coefficient on *sex* (male=1) is negative and statistically significant, indicating that males are less likely to graduate from high school than females. Lamb (2014) also finds the male indicator variable to be positively and significantly related to early school leaving across all age groups she considers. Many reasons have been put forward for the higher male dropout rate - whether a greater pull to work in the trades or less engagement with school (see, for example, Canadian Council on Learning, 2005).

Table 6: Probit Regression Results: Average Marginal Effects (dy/dx)

Dependent variable: <i>Grad</i>				
Variables	Age 18-25		Age 26-32	
	Without controls	With Controls	Without controls	With Controls
<i>t</i> ₂₀₀₅	0.029 (0.015)***	0.086 (0.015)*	0.029 (0.016)***	0.085 (0.016)*
<i>North</i>	-0.388 (0.019)*	-0.204 (0.024)*	-0.420 (0.023)*	-0.246 (0.029)*
<i>North</i> * <i>t</i> ₂₀₀₅	-0.008 (0.029)	-0.035 (0.027)	0.054 (0.034)	0.027 (0.033)
<i>Sex</i>		-0.084 (0.014)*		-0.051 (0.015)*
<i>Fam_Res_School_Attend</i>		-0.073 (0.019)*		-0.055 (0.021)*
<i>Res_School_Attend</i>		-0.121 (0.047)*		-0.156 (0.035)*
<i>Speak_Ab_Lang</i>		-0.142 (0.015)*		-0.143 (0.017)*
<i>Not_moved</i>		-0.015 (0.015)		-0.027 (0.016)***
<i>Health</i>		-0.022 (0.019)		0.001 (0.022)
<i>Taught_About_Ab_Peoples</i>		0.123 (0.015)*		0.117 (0.016)*
<i>Ab_Teacher</i>		-0.019 (0.018)		-0.004 (0.022)
<i>Taught_Ab_Lang</i>		-0.110 (0.021)*		-0.089 (0.030)*
Pseudo R ²	0.027	0.088	0.022	0.071
Weighted N ^(a)	287960	287960	253730	253730

Note: Robust standard errors (Huber/White/sandwich estimate) reported under coefficient estimates. The Delta Method is used to compute the average marginal effects. *, **, and *** indicate statistical significance at 1%, 5%, and 10% levels, respectively. *North* takes the value of 1 for Northern communities, 0 otherwise; *grad* takes the value of 1 for a high school graduate, 0 otherwise; *t*₂₀₀₅ takes the value of 1 for year 2005, 0 otherwise. ^(a) Given restrictions on the use of micro-data for the APS from Statistics Canada Research Data Centre (RDC), we cannot report un-weighted number of observations.

Both variables indicating attendance at a residential school - *Res_School_Attend* and *Fam_Res_School_Attend* - are negatively related to the probability of graduating from high school. The result that a family member's residential school attendance is associated with a lower probability of graduation could reflect the inter-generational persistence of the negative effects of residential schooling

or a family member’s disapproval of the formal education system as a result of residential schooling. More generally, these results support the growing evidence of the harmful effects of the residential school system on current socio-economic outcomes (Feir, 2014).

With regard to the ability of a respondent to speak an Aboriginal language (*Speak_Ab_Lang*), consistent with our expectation, we find that it has a negative and statistically significant relationship with *Grad*. Lamb (2014) also finds an indicator of speaking an Aboriginal language to be positively and significantly related to early school leaving across all age groups considered.

While *Not_Moved* is negatively related to the probability of high school graduation, its marginal effect is low and the association is statistically significant only for the 26-32 age group.

For the schooling-related variables, we find, contrary to our expectation, that being taught an Aboriginal language would enhance a child’s sense of identity and therefore increase the likelihood of graduation, *Taught_Ab_Lang* is negatively related to *Grad* and that the relationship is statistically significant. Our findings, however, are consistent with that of the Cree School Board (2008), which reports negative outcomes on standardized tests and curricular learning for the Cree Language of Instruction Program instituted in 1991 by the Cree School Board in Eastern Quebec.

While we find no effect of *Ab_Teacher* on *Grad*, it is worth noting that the only variable that is positively related to the probability of graduation is *Taught_About_Ab_Peoples*. We had expected this result – that a more culturally-relevant curriculum could appeal to students and potentially be associated with them staying in school for longer and eventually graduating from high school. Lamb (2014) also finds that an indicator of learning about Aboriginal peoples/history in school is negatively and significantly related to early school leaving across all age groups in her analysis.

6.1. Decomposition

While the regression results with and without control variables provide suggestive evidence that the variables we consider can account for more than 40 percent of the gap in the probability of graduating from high school between the North and the South, better estimates of the explained difference can be obtained by undertaking the Oaxaca-Blinder decomposition. The decomposition also provides a way to evaluate the relative importance of each of the determinants that we consider in explaining the gap in probability of graduating from high school between the North and the South. We follow Powers et al. (2011) to undertake the decomposition using estimates from the probit regression models for the two Aboriginal Peoples’ Surveys.

The decomposition proceeds as follows. For the two age groups, the probit regression models with *Grad* as the dependent variable and the individual-specific and school-related variables as the independent variables are estimated using data for the group with the larger sample, the South, separately for APS 2000 and APS 2005. The estimates are then used to compute the explained difference in the mean probability of graduation between the North and the South by the variables of interest using:

$$\overline{Grad}_{South} - \overline{Grad}_{North} = \overline{\Phi(X_{South}\beta_{South})} - \overline{\Phi(X_{North}\beta_{South})}, \quad (2)$$

where \overline{Grad}_j is the mean of the probability of graduation, β_{South} is the estimated probit regression model coefficients for the variables of interest for the South, and $\Phi(X_j\beta_{South})$ is the mean of the cumulative normal distribution function for $j=South, North$.

Table 7 provides the results of the decomposition for APS 2000 and APS 2005 for the two age groups. The last row of the Table provides the total difference in the probability of graduation between the North and the South that can be explained by differences in the variables of interest between the two regions. For the 18-25 year old age group, the variables we consider can explain 59 percent (31 percent) of the difference in the probability of graduation in the year 2000 (2005). Similar results are obtained for the 26-32 year old age group, with the control variables explaining 38 percent (44 percent) of the difference in the probability of graduation for 2000 (2005).

**Table 7: Decomposition Results - Probit Regressions
(Percentage explained by each variable)**

Variables	Age 18-25		Age 26-32	
	APS 2000	APS 2005	APS 2000	APS 2005
<i>Sex</i>	0.70	1.11	0.01	2.14
<i>Fam_Res_School_Attend</i>	-0.96	1.92	0.53	3.95
<i>Res_School_Attend</i>	0.29	0.22	1.28	1.87
<i>Speak_Ab_Lang</i>	38.29	14.76	27.20	19.97
<i>Not_Moved</i>	1.86	0.27	2.47	1.27
<i>Health</i>	0.47	-1.32	-0.12	-0.04
<i>Taught_About_Ab_Peoples</i>	-2.70	-3.83	-3.27	-4.67
<i>Ab_Teacher</i>	2.79	3.60	3.11	-2.14
<i>Taught_Ab_Lang</i>	17.83	14.05	7.22	21.84
Total % Explained	58.55	30.76	38.43	44.19

Note: The '% Explained' for each variable is calculated using equation (2).

The individual-specific and schooling-related variables we consider explain a larger proportion of the North-South gap for the 18-25 year old age group in 2000 and for the 26-32 year old age group in 2005. These two groups went through high school in the late 1990s, and were the first to be exposed to curricular changes in Northern schools, discussed in Section 2 above. As is evident from Table 5, almost 80 percent of this cohort was taught an Aboriginal language compared to only 11 percent of Aboriginal individuals in the South. This large difference, coupled with the fact that learning an Aboriginal language in school is negatively related with high school graduation, entails a large explanatory contribution of the variable *Taught_Ab_Lang* for this cohort.

The large gap in speaking an Aboriginal language between respondents from the North and the South combined with its negative and statistically significant relation with high school graduation results in a large percentage of the gap being explained by *Speak_Ab_Lang*. Further, the percentage explained by the variable is higher in 2000 than in 2005 for both age groups as the North-South gap in Aboriginal language proficiency decreased over this period (Table 4).

There are also large differences across regions in having an Aboriginal teacher (*Ab_Teacher*) and remaining in one's community (*Not_Moved*). However, since the magnitude of the estimated coefficients for these variables is small, they explain a lower fraction of the difference in the probability of graduation between the two regions.

As noted in the last section, the variables related to attending a residential school (*Res_School_Attend* and *Family_Res_School_Attend*) have relatively large marginal effects on the probability of high school graduation compared with other variables. However since there are small inter-regional differences for these variables, their ability to explain the North-South gap in high school graduation is low.

Finally there are large inter-regional differences in being taught about Aboriginal culture and history in school (*Taught_About_Ab_Peoples*) for both cohorts in 2005, with students in the North being taught about their culture to a greater extent relative to students in the South. However, because this variable has a positive marginal effect on graduation, it does not assist in explaining the North-South gap in graduation. This North-South curricular difference rather provides us with insight into a possible policy change that could reduce the North-South gap in high school graduation. In particular, it suggests that initiatives such as those taking place in Nunavut, where Aboriginal values and the way of life are woven through the curriculum, could improve graduation rates for Aboriginal students across Canada.

Overall, for both surveys and age groups, two variables account for almost all of the explained difference in the probability of graduation: *Taught_Ab_Lang* and *Speak_Ab_Lang*. These variables also had high average marginal effects for the probit results reported in Table 6. Further, the results suggest that the variables we consider can explain more of the North-South gap in high school graduation rates for the age groups most affected by rapid educational change in the North (18-25 year olds in 2000 and 26-32 in 2005).

7. Conclusions and Policy Recommendations

This paper examines the importance of economic incentives, individual-specific factors (residential school attendance, health, among others) and school-related factors (culturally-relevant curricula and Aboriginal teachers) in explaining the difference in high school graduation rates between Aboriginal peoples in the Canadian North relative to the South. We find that economic incentives are not likely to be important for explaining this difference, because they favour high school graduation, both in terms of enabling individuals to find employment and in terms of providing a significant earnings premium after graduating from high school in the North relative to the South.

With regards to schooling related and individual-specific factors, we find that the two language-related variables - *Taught_Ab_Lang* and *Speak_Ab_Lang* - are the most important for explaining the North-South gap in high school graduation rates. First, for the 18-25 year old age group, we find that being taught an Aboriginal language accounts for 17 percent (14 percent) of the explained North-South gap in high school completion in 2000 (2005). In residential schools in Canada, children were prevented from using their native language and sometimes punished for using it, while the importance of English and French was emphasized (Barnes, Josefowitz and Cole, 2005). This purposeful eradication of Aboriginal languages has caused a backlash in schools across the country, and many schools now see it

as their role to revitalize Aboriginal languages. This is particularly the case in the North where Inuit are the majority (in Nunavut and Nunavik). Hence, while the current emphasis on Aboriginal language instruction is important for cultural revitalization in the North, this may come at the cost of lower high school graduation rates if proper supports for bilingualism are not provided.²⁰

Second, for the 18-25 year old age group, we find that speaking/understanding an Aboriginal language accounts for 38 percent (15 percent) of the explained North-South gap in high school attainment in 2000 (2005). We interpret this result to reflect the concern in the education literature that a student's general academic performance may suffer if they are not fluent in the language of instruction in school. Our findings suggest that in areas where Aboriginal language use is common (the North), support for English language proficiency may be needed to ensure a smooth transition to English-medium high school. As noted above, in Nunavut, children may in the future attend Inuktitut/Innuinaqtun-medium elementary high school. To ensure that students do not have to sacrifice subject-specific knowledge to be educated in an Aboriginal language, the Nunavut Department of Education could provide increased resources, such as Inuktitut/Innuinaqtun textbooks in all subjects, to support the transition to a fully bilingual elementary school system.

The only variable that we find is positively related to the probability of high school graduation is the indicator of being taught about Aboriginal history and customs in school. This suggests that the multitude of efforts to incorporate Aboriginal culture and history into curricula across Canada – in the North and the South – may improve high school graduation rates. For example, Nunavut and the Northwest Territories have recently introduced a mandatory program to educate students about the legacy of Canada's residential school system. Our results suggest that such curricular programming, and resources to support such programming, could increase high school graduation rates in the North.

Overall, our findings suggest a nuanced relationship between the cultural content of curricula and the probability of graduating from high school. While being taught about Aboriginal history and culture is associated with a higher probability of high school graduation, being taught an Aboriginal language is negatively associated with it. Even though, given data constraints, we are unable to estimate causal relationships between the variables and the probability of high school graduation, our findings highlight a potential tradeoff between the incorporation of Aboriginal languages into curricula and academic achievement, which policymakers will need to address take into account when designing education policies in the North.

²⁰ The Northwest Territories Aboriginal Languages Plan (2013) (Government of the NWT, 2013) calls for a number of interesting initiatives such as having an Aboriginal language coach per regional board to assist and mentor Aboriginal language teachers; promoting teaching as an exciting, positive and rewarding career choice by developing a revised NWT recruitment and retention plan for Aboriginal teachers; providing ongoing professional development opportunities and training for Aboriginal language learning for all NWT teachers and developing packaged learning programs and materials to support home study and learning of Aboriginal languages (Government of the NWT, 2013).

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