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Aboriginal Language and School Outcomes: Investigating the Associations for Young Adults

Anne Guevremont
Statistics Canada, anne.guevremont@gmail.com

Dafna Kohen
Statistics Canada; University of Ottawa, dafnakohen@hotmail.com

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Abstract
Being taught an Aboriginal language at school has generally been associated with positive school outcomes for Aboriginal children but not adults. This study attempted to understand this discordance by examining three possible explanations: (a) confounding variables, (b) a cohort effect, and (c) differences in the timing and duration of Aboriginal language instruction. Confounding variables (school attendance on reserve, parental education, and family residential school attendance) and duration of Aboriginal language instruction (six of more grades) were important contributors; whereas the presence of a cohort effect and the timing of Aboriginal language instruction were not found to be significant. Future studies of Aboriginal language instruction should consider family educational experiences, location of schooling, and the duration of Aboriginal language instruction.

Keywords
First Nations, Aboriginal language, high school completion, residential school, parental education

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Aboriginal Language and School Outcomes: Investigating the Associations for Young Adults

Language is an important part of Aboriginal culture and identity. Language "is not only a means of communication, but a link which connects people with their past and grounds their social, emotional and spiritual vitality" (Norris, 1998, p. 8). Indeed, 67% of parents of First Nations children under the age of 6 think it is important that their child speaks and understands an Aboriginal language. However, the percentage of First Nations people able to converse in an Aboriginal language has decreased from 29% in 2006 to 22% in 2011, although the percentage of speakers who learned the language as a second language increased slightly from 20% in 2001 to 22% in 2011 (Langlois & Turner, 2014; Norris, 2007). One of the contexts in which children may acquire language is through their experiences at school. However, education delivery for First Nations students in Canada is complex. Different systems of governance and funding are involved and therefore education can be delivered in different ways (see Raham, 2009 for a review). First Nations students who live off reserve attend provincial schools serving broader populations. First Nations students who live on reserve may attend schools operated by their bands and located in their community (Assembly of First Nations, 2012); they may also attend provincial schools through educational service or tuition agreements negotiated by their bands or the regional INAC offices (Drummond & Rosenbluth, 2013). The northern territories typically provide education services for their Registered Indian and/or Inuit populations. Within these systems, the provision of Aboriginal language education within the school curriculum varies widely by location (on reserve versus off reserve; province or territory of residence) (Fulford, Daigle, Stevenson, & Wade, 2007; Raham, 2009). Even on reserve, there are varying degrees of autonomy and responsibility with regards to school curriculum.

Studies that have examined Aboriginal language learning and school outcomes have yielded mixed results. Using population-based data, exposure to an Aboriginal language at school has been associated with positive school outcomes for First Nations children in Canada. Based on data from the 2001 and 2006 Aboriginal Peoples Survey (APS), Guèvremont and Kohen (2012, 2017) reported that learning an Aboriginal language from school teachers was associated with more positive parental ratings of the child's school achievement, the child looking forward to going to school, increased school satisfaction, as well as increased parental educational expectations for their child. In addition, a qualitative series of studies produced by the Canadian Society for the Advancement of Excellence in Education (Bell et al., 2004; Fulford, Daigle, et al., 2007; Fulford, Raham, Stevenson, & Wade, 2007) provided case studies of 30 different "successful" Aboriginal schools based on high standardized test performance and relatively high graduation rates. These schools were nominated after consultations with knowledgeable informants from departments of education, school districts, First Nations groups, and universities. In the majority of schools selected a respect for Aboriginal culture and traditions as well as instruction of an Aboriginal language were identified as important aspects for successful student outcomes. However, these studies were based on case studies and no comparison schools (without Aboriginal culture or language) were examined.

Aboriginal language programs have also been associated with positive school outcomes for other Aboriginal groups and in other countries. Wright and Taylor (1995) found that instruction in Inuktitut to a group of Inuit children in kindergarten to Grade 3 was associated with positive self-esteem compared to children who were taught in their second language (English or French). A follow-up study

of these children over time showed that children's proficiency in Inuttitut in the last year of the Inuttitut program was the best predictor of success in the subsequent year of education in English or French (Louis & Taylor, 2001). In New Zealand, Maori students enrolled in Maori-medium schools (where Maori language made up at least 12% of teaching and learning) scored higher on standardized tests compared to Maori students in other schools (New Zealand Ministry of Education, 2009). Immersion students in the Navajo Nation in the southwestern United States performed similarly or better than non-immersion third graders on standardized Math and English assessments (Romero-Little & McCarty, 2006; Rosier & Holm, 1980). For example, for math, 68% of Navajo immersion students met or exceeded state standards compared to 15% of Navajo students in the mainstream English program (Romero-Little & McCarty, 2006).

However, not all studies of Aboriginal language programs have reported positive results. The Cree School Board (2008) reported negative outcomes on standardized tests and curricular learning for children enrolled in the Cree Language of Instruction Program. However, the school board also reported numerous challenges faced by the schools of the Cree school board, including poor student attendance, high teacher absenteeism with unqualified substitution, inadequate classroom facilities, problems with teacher quality, and inadequate instructional materials. Separating the effects of the language program on student outcomes from these other difficulties, in the absence of a comparison group that did not receive instruction in Cree, was not possible.

Furthermore, despite the evidence of Aboriginal language programs reporting positive results for children (Guèvremont & Kohen, 2012; Rosier & Holm, 1980), similar positive results have not been found for adults. Speaking an Aboriginal language has been associated with both a lower likelihood of high school graduation (Hull, 2015; Lamb, 2014; O'Gorman & Pandey, 2015) and a lower likelihood of obtaining post-secondary education (Brade, Duncan, & Sokal, 2003; Hull, 2015). Similarly, Guèvremont and Kohen (2012) found that First Nations adults who spoke an Aboriginal language were less likely to have completed high school, whether they had learned the language in school or not. Yet, this same study found positive results for children using the same population-based dataset, the Aboriginal Peoples Survey (Guèvremont & Kohen, 2012).

Several reasons may explain why associations have been found to be generally positive for children and negative for adults. One possibility is that confounding variables that may be associated with both Aboriginal language and educational outcomes have not been examined or controlled for, such as parental education or family residential school attendance (Brade et al., 2003; Hull, 2015). Higher parental education has been associated with an increased likelihood of children's high school completion in both the general (Jimerson, Egeland, & Teo, 1999) and Aboriginal populations (Arim, Tam, Bougie, & Kohen, 2016; Bougie, Kelly-Scott, & Arriagada, 2013). A particular issue for First Nations related to educational experiences is the legacy of residential schooling (Aboriginal Healing Foundation, 2002). The experiences of children at residential schools continue to influence the education and development of First Nations children and adults (Truth and Reconciliation Commission of Canada, 2015). Indeed, First Nations and Registered Indian children living off reserve whose parents did not attend a residential school were more likely to be rated as doing well in school compared to their counterparts with parents who attended residential schools (Bougie, 2009; Bougie & Senécal, 2010).

Moreover, whether students attended school on reserve could affect their educational outcomes, in particular because First Nations people living on reserve tend to live in more difficult socio-economic circumstances than First Nations people living off reserve. In 2011, First Nations people living on reserve were more likely than First Nations people living off reserve to live in a home in need of major repair (43% vs. 15%), to live in crowded homes (28% vs. 7%), and to have no certificate, degree, or diploma (47% vs. 26%) (Kelly-Scott & Smith, 2015). However, schools on reserve may be more likely to offer Aboriginal language and cultural programming. In 2011, 88% of First Nations schools on reserve offered bilingual programming or Indigenous language classes (Assembly of First Nations, 2012). By comparison, in 2006, of the 8% of 6- to 14-year-old First Nations children living off reserve who spoke an Aboriginal language, 41% reported that they were taught the language in school by a teacher (Guèvremont & Kohen, 2017). Therefore, Aboriginal language instruction may be confounded with socio-economic circumstances also known to influence school outcomes.

Thus, studies must consider which factors may be instrumental in associations between Aboriginal language and school outcomes. Factors such as parental education, family residential school attendance, and receipt of education on or off reserve, which are not typically included in studies of Aboriginal language and school outcomes, have all been shown to be associated with adult educational outcomes. These factors were available on the 2012 Aboriginal Peoples Survey and were considered in the current study.

A second possible explanation, which may account for the different associations between language and school outcomes for children and adults, is a potential cohort effect. It is possible that associations between school outcomes and learning an Aboriginal language differed for the cohorts of children and adults because each group was born at a different time and was therefore exposed to different demographic and educational societal trends. As an example, our previous study (Guèvremont & Kohen, 2012) showed a positive association between language and school outcomes for children aged 6 to 14 in 2001, but not for a cohort aged 20 to 34 in the same year. The current study allows us to examine the educational outcomes of the 6- to 14-year-old child cohort 11 years later, as an adult cohort, now aged 17 to 25 years, since both the 2001 and the 2012 Aboriginal Peoples Survey included similar content on both speaking an Aboriginal language and being taught the language in school. As the Aboriginal Peoples Survey is not a longitudinal study, it is not the same group of children followed over time, but the "cohort" is the same. That is, the participants were born in the same time period and exposed to the same events and demographic trends. So, if previous findings (Guèvremont & Kohen, 2012, 2017) of positive associations for children but not for adults were attributable to a cohort effect, the negative findings for adults should not be replicated in the present study with a different cohort. If, on the other hand, negative associations are found between language learning and adult outcomes, this study would provide additional evidence of a differential impact of Aboriginal language learning on children's outcomes as compared to adults' outcomes.

A third reason for the different associations between Aboriginal language education and school outcomes for children and adults may be differing durations and timing of Aboriginal language instruction, factors that have not been considered previously. It is possible that there are greater opportunities for language and cultural immersion programs for younger children (e.g., Aboriginal Head Start) or that young children attend immersion programs for longer periods of time compared to older Aboriginal language learners. Studies of second language immersion programs for children show that the

length of time in immersion programs (duration) is associated with greater benefits including positive educational outcomes (Bialystok & Barac, 2012; Bialystok, Peets, & Moreno, 2014). In terms of timing, some advocate that earlier is better, at least in terms of learning a first language (Kuhl, 2004); however, older children may learn a second language faster than younger children (MacSwan & Pray, 2005) although they may have more difficulty with pronunciation (Collier, 1989). To our knowledge, no studies have examined the role of duration and timing of Aboriginal language instruction on school outcomes. The 2012 Aboriginal Peoples Survey asked respondents about Aboriginal language learning in school, including in which grades they were taught the language and whether they were taught any other subjects in the language. These additional questions allow for a more detailed analysis of how Aboriginal language learning is related to school outcomes.

Following our earlier work, this article seeks to further understand associations between speaking an Aboriginal language, learning it in school, and educational outcomes for young adults aged 17 to 25. A focus on this young adult cohort will provide information on whether positive associations previously reported between Aboriginal language learning and school outcomes among members of this cohort during childhood are maintained in adulthood. To shed light on previous findings, the study will also examine whether parental education, family residential school attendance, and receiving education on reserve are associated with educational outcomes and whether speaking an Aboriginal language and learning it in school are associated with educational outcomes after controlling for these factors. Lastly, this study will examine whether the duration and timing of Aboriginal language instruction are associated with school outcomes.

Methods

Data Source and Sample

This study uses data from the 2012 Aboriginal Peoples Survey (Statistics Canada, 2012), which included First Nations living off reserve, Inuit, and Métis aged 6 and older. This study includes only young adults who identified as First Nations (either alone or along with Inuit and/or Métis identity), and were aged between 17 and 25 years. Proxy reporting was used in the 2012 Aboriginal Peoples Survey for youth aged 15 to 17 whose parents did not give approval for the survey to be conducted directly and for adults in certain specific situations (for example, when the selected adult was not able to answer for health related reasons, due to a language barrier, or because the selected respondent was going to be away from home for the duration of the survey) (Cloutier & Langlet, 2014). The majority of respondents completed the survey themselves (66% of 17 year olds, 84% of the entire sample).

Definitions of Variables

Aboriginal language instruction at school. All respondents were asked whether they were taught an Aboriginal language in school and whether they were taught other subjects in an Aboriginal language. Respondents who said yes to either of these questions were considered as having been taught an Aboriginal language in school.

If a respondent said they had been taught an Aboriginal language in school, they were asked in which grade they had been taught an Aboriginal language. The number of grades of instruction was totalled in order to determine the duration of Aboriginal language instruction; a dichotomous variable of 6 or more years was created in order to examine associations between duration of Aboriginal language instruction

and educational outcomes. Three dichotomous variables were created to indicate the timing of Aboriginal language instruction: taught an Aboriginal language in preschool or kindergarten (vs. not), taught an Aboriginal language in Grades 1 to 6 (vs. not), and taught an Aboriginal language in Grades 7 to 12 (vs. not).

Aboriginal language knowledge. Respondents were asked whether they speak an Aboriginal language, even if only a few words. If yes, they were asked how well they speak an Aboriginal language. Respondents were considered to speak an Aboriginal language if they spoke the language with effort, relatively well, or very well (compared to not at all or only a few words). This definition of speaking an Aboriginal language has been used in previous research (Guèvremont & Kohen, 2012, 2017), and aligns with the definition of speaking a language used in the Census of Canada, which asks in which languages respondents are able to converse (Statistics Canada, 2013).

Outcomes

In or completed high school. Young adults were asked if they were currently in high school or had completed high school. Completing high school included both graduating from high school and successfully completing a high school equivalency program.

Mainly "A"s. Young adults were asked about either their grades on their last report card or their grades in their last year of school. Responses of mainly "A"s were compared to responses of mainly "B"s, "C"s, "D"s, or "E"s and "F"s.

Family school involvement. Young adults were asked about their parents', guardians', or any other family members' school involvement either during this school year (if currently in school) or in their last year of high school (if completed or left high school). The three activities included:

a. Speak to, correspond with, or visit your teacher (including parent-teacher interviews);

b. Attend a school event in which you participated (for example, a play, sports competition, or science fair); and

c. Participate in other school activities?

Participation in two or three activities was considered family school involvement.

Covariates

Mother's education. Participants were asked, "What is the highest level of education that your mother or female guardian has ever completed?" A dichotomous variable was created indicating whether or not the respondent's mother had completed high school.

Father's education. Participants were asked, "What is the highest level of education that your father or male guardian has ever completed?" A high percentage of respondents (21%) had missing responses to this item; therefore, three categories were included:

a. Father did not complete high school,

b. Father completed high school, and

c. Father education information missing.

Attended school on reserve. Participants were asked whether they had ever attended an elementary or high school located in a First Nations community (on reserve), including preschool or kindergarten. Responses were categorized as "ever" or "never."

Family residential school attendance. Participants were asked, "Were any of the following members of your family ever a student at a residential school or a federal industrial school?" Respondents who said that a parent or grandparent had attended residential school were considered as having family residential school attendance.

Analysis

Descriptive analyses (percentages, means) were used to describe the characteristics of respondents in three separate groups:

a. Young adults who were not taught an Aboriginal language in school,

b. Young adults who were taught an Aboriginal language in school but did not speak an Aboriginal language, and

c. Young adults who were taught an Aboriginal language in school and did speak an Aboriginal language.

Differences between the descriptive characteristics for these three groups were assessed with chi-square tests. A small percentage of respondents (2.09%, have estimates to be used with caution due to small sample size) reported that they spoke an Aboriginal language, but had not been taught the language in school. They are not included in this study due to low sample size.

Multiple logistic regression was used to examine the association of being taught an Aboriginal language in school, being able to currently speak the language, and school outcomes. For each outcome, two models were assessed. Model 1 examined the association of speaking an Aboriginal language, being taught the language in school, and school outcomes without adjusting for any other variables. Model 2 examined the same associations while controlling for the following factors: age, gender, mother's education (completed high school or did not complete high school), father's education (completed high school, did not complete high school, or missing because respondent did not know father's highest level of education), whether the respondent had ever attended school on reserve (ever or never), and whether the respondents' parents or grandparents had attended residential school (yes or no).

Similarly, multiple logistic regression was used to examine the association of the timing and duration of Aboriginal language instruction with school outcomes. Model 1 examined the association of duration or timing without adjusting for any other variables, and Model 2 controlled for family educational experiences and on-reserve school attendance as well as age and gender to see if timing and duration had an impact over and above these additional factors.

Analyses were weighted in order to be nationally representative of the off-reserve First Nations population. The bootstrap method was used to account for the complex sampling design used by the APS survey (Rao, Wu, & Yue, 1992; Rust & Rao, 1996).

Results

Descriptives

For off-reserve First Nations young adults aged 17 to 25, 36% reported that they had been taught an Aboriginal language in school according to the 2012 APS, but only 12% reported that they could speak an Aboriginal language. Combining these two variables, 62% of young adults could not speak in an Aboriginal language and were not taught the language in school (representing 50,212 people), 26% were taught the language in school but were not conversant (representing 18,660 people), 2% (estimate to be used with caution due to small sample size, representing 1,610 people) spoke the language but were not taught it in school (not included in study because of small sample size), and 10% reported that they could speak an Aboriginal language and were taught the language in school (representing 6,674 people).

For off-reserve First Nations young adults, being taught an Aboriginal language in school as well as being able to speak the language was associated with different educational experiences for their families (Table 1). In terms of mother's education, 19% of respondents who were not taught an Aboriginal language at school had mothers who had not completed high school, compared to 22% of respondents who were taught an Aboriginal language at school but could not speak it, and 42% of respondents who were taught an Aboriginal language at school and could speak it. Father's education followed as similar pattern—20% of respondents who were not taught an Aboriginal language at school had fathers who had not completed high school, compared to 30% of respondents who were taught an Aboriginal language at school but could not speak it, and 33% of respondents who were taught an Aboriginal language at school and could speak it. Similar trends were observed for attending school on reserve (6%, 47%, 64%), having a parent or grandparent who attended residential school (40%, 73%, 78%), and thinking that speaking or understanding an Aboriginal language was important (47%, 75%, 95%), with respondents who were not taught an Aboriginal language at school having the lowest percentage followed by respondents who were taught an Aboriginal language at school but could not speak it and then the highest percentage for respondents who were taught an Aboriginal language at school and could speak it.

School Outcomes

For off-reserve First Nations young adults aged 17 to 25, being taught an Aboriginal language in school (both for those who did and did not report speaking an Aboriginal language) was negatively associated with being in or having completed high school compared to young adults who were not taught an Aboriginal language in school (see Table 2). However, after accounting for mother's and father's education, school attendance on reserve, and family residential school attendance, this association was no longer statistically significant. That is, for young adults who were taught an Aboriginal language at school, whether they spoke the language or not, the likelihood of being in or having completed high school was not significantly different compared to young adults who were not taught an Aboriginal language in school.

Table 1. Characteristics of Off-Reserve First Nations Children and Young Adults Who Were and Were Not Taught an Aboriginal Language in School

	Taught Aboriginal language in school and/or speaks language			
	Not taught, does not speak (N = 1,397, 62.14%)	Taught, does not speak (N = 423, 26.11%)	Taught and speaks (N = 116, 9.56%)	Chi-square
Mother's education				
Mother did not complete high school	18.74%	21.55%	42.36%	3.26*
Mother completed high school	81.26%	78.45%	57.64%	
Father's education				
Father did not complete high school	19.65%	30.04%	32.38%[E]	4.66***
Father completed high school	64.63%	45.02%	43.68%	
Father education missing	15.72%	24.94%	23.94%[E]	
Attended school on reserve				
Never	93.96%	52.98%	35.67%[E]	46.76***
Ever	6.04%[E]	47.02%	64.33%	
Parent or grandparent attended residential school				
No	60.24%	26.79%	22.56%[E]	31.75***
Yes	39.76%	73.21%	77.44%	
Aboriginal mother tongue				
No	F	96.81%	77.65%	22.93***
Yes	F	3.19%[E]	22.35%[E]	

	Taught Aboriginal language in school and/or speaks language			
	Not taught, does not speak (N = 1,397, 62.14%)	Taught, does not speak (N = 423, 26.11%)	Taught and speaks (N = 116, 9.56%)	Chi-square
Speaking or understanding Aboriginal language somewhat or very important				
No	53.06%	25.08%	5.17% [E]	39.52***
Yes	46.94%	74.92%	94.83%	
Taught Aboriginal language for six or more years				
No	n/a	76.87%	53.43%	12.50***
Yes	n/a	23.13%	46.57%	
Taught Aboriginal language in preschool or kindergarten				
No	n/a	73.38%	70.91%	0.19
Yes	n/a	26.62%	29.09%	
Taught Aboriginal language in Grades 1 to 6				
No	n/a	38.78%	13.87%	18.33***
Yes	n/a	61.22%	86.13%	
Taught Aboriginal language in Grades 7 to 12				
No	n/a	44.22%	30.70%	4.59*
Yes	n/a	55.78%	69.30%	

Note. A small percentage of respondents (2.09%[E]) reported that they spoke an Aboriginal language, but had not been taught the language in school. They are not included in this table because of the small sample size. n/a = not applicable. F = too unreliable to be published.

[E] use with caution.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 2. Logistic Regression Models Predicting Young Adults' School Outcomes

	In or completed high school		Mostly "A"s in last year of school		Family school involvement	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Taught Aboriginal language in school and/or speaks language						
Not taught, does not speak	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*
Taught, does not speak	0.39 (0.28 - 0.55)***	0.64 (0.40 - 1.03)	0.36 (0.23 - 0.55)***	0.39 (0.23 - 0.65)***	0.98 (0.65 - 1.47)	0.81 (0.50 - 1.30)
Taught, speaks	0.47 (0.28 - 0.78)**	1.21 (0.61 - 2.41)	0.61 (0.35 - 1.08)	0.68 (0.34 - 1.35)	1.77 (1.00 - 3.14)*	1.63 (0.79 - 3.37)
Age (in years)		0.94 (0.88 - 0.99)*		1.02 (0.96 - 1.09)		1.06 (0.99 - 1.14)
Male		0.78 (0.55 - 1.10)		0.53 (0.36 - 0.77)***		1.14 (0.81 - 1.61)
Mother's education						
Mother did not complete high school		0.37 (0.24 - 0.59)***		0.68 (0.39 - 1.18)		0.50 (0.29 - 0.85)*
Mother completed high school		*Ref.*		*Ref.*		*Ref.*
Father's education						
Father did not complete high school		0.57 (0.37 - 0.88)*		0.94 (0.61 - 1.46)		1.18 (0.70 - 1.97)
Father completed high school		*Ref.*		*Ref.*		*Ref.*
Father education missing		0.38 (0.24 - 0.61)***		0.68 (0.37 - 1.25)		0.85 (0.52 - 1.38)
Attended school on reserve						
Never		*Ref.*		*Ref.*		*Ref.*
Ever		0.50 (0.31 - 0.83)**		1.04 (0.63 - 1.70)		1.07 (0.63 - 1.82)
Family residential school attendance						
No		*Ref.*		*Ref.*		*Ref.*
Yes		0.63 (0.43 - 0.91)*		0.75 (0.51 - 1.12)		1.36 (0.93 - 2.01)

Note. Logistic regression coefficients with confidence intervals in brackets. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

In terms of receiving mostly "A"s on their last report card, young adults who had been taught an Aboriginal language in school but who did not speak an Aboriginal language were less likely to report that they had received mostly "A"s on their last report card, compared to young adults who were not taught an Aboriginal language. Young adults who were taught an Aboriginal language in school and spoke the language were no more or less likely to report receiving mostly "A"s on their last report card compared to young adults who had not been taught an Aboriginal language in school.

The third outcome this study examined was whether being taught an Aboriginal language was associated with family school involvement. Young adults who were taught an Aboriginal language but did not speak it were not significantly different in family school involvement compared to those who were not taught an Aboriginal language in school. However, young adults who were taught an Aboriginal language at school and spoke the language were more likely to report family school involvement compared to young adults who were not taught an Aboriginal language. After controlling for other factors, this relationship was still positive but no longer statistically significant suggesting that there were other important factors associated with family school involvement.

All of the factors included as covariates in the models were associated with the school outcomes examined (Table 2). Young adults whose mothers had not completed high school were less likely to be in or have completed high school and less likely to have reported family school involvement compared to young adults whose mothers had completed high school. Similarly, young adults whose fathers had not completed high school or who did not report the educational status of their father were less likely to have completed high school compared to young adults whose fathers' had completed high school. Ever having attended a school on reserve was associated with a lower likelihood of being in or having completed high school. Lastly, family residential school attendance was also associated with a lower likelihood of being in or having completed high school.

Duration and Timing of Aboriginal Language Instruction

The association of duration and timing with school outcomes was also examined. About 10% of young adults reported being taught an Aboriginal language in school for six or more grades. They were more likely to be able to speak an Aboriginal language (42% vs. 7%; $\chi^2 = 27.93$, $p < 0.001$), to have a father who did not complete high school (33% vs. 22%; $\chi^2 = 5.49$, $p < 0.01$), to have ever attended school on reserve (63% vs. 17%; $\chi^2 = 44.76$, $p < 0.001$), and to have a parent or grandparent who attended residential school (73% vs. 50%; $\chi^2 = 18.45$, $p < 0.001$) than young adults who did not report being taught an Aboriginal language in school for six or more grades. They also had higher current exposure to an Aboriginal language and were more likely to be exposed daily to an Aboriginal language at home (32% vs. 11%; $\chi^2 = 18.66$, $p < 0.001$) or outside the home (27% vs. 8%; $\chi^2 = 16.04$, $p < 0.001$). Lastly, those respondents who had been taught an Aboriginal language for six or more grades were more likely to think that speaking or understanding an Aboriginal language was somewhat or very important (84% vs. 57%; $\chi^2 = 35.49$, $p < 0.001$).

In terms of the grades in which individuals had been taught an Aboriginal language at school (i.e., timing), 9% were taught the language in preschool or kindergarten, 23% in Grades 1 to 6, and 20% in Grades 7 to 12. These percentages do not add up to 34% (the overall percentage taught an Aboriginal

language in school in any grade) because a student could have been taught an Aboriginal language in more than one of the above time periods.

Duration but not timing was associated with off-reserve First Nations young adults' school outcomes after controlling for school attendance on reserve and family educational experiences. Young adults who reported receiving 6 or more years of Aboriginal language instruction were more likely to have completed high school compared to young adults who had received less than 6 years of Aboriginal language instruction (Table 3).

In terms of timing, there were no significant associations between being taught an Aboriginal language in preschool or kindergarten, or in Grades 7 to 12 (vs. not) and each of the outcomes examined (Table 4). However, being taught an Aboriginal language in Grades 1 to 6 was negatively associated with being in or completing high school and having received mostly "A"s in the last year of school. Once controls were included in the model, being taught an Aboriginal language in Grades 1 to 6 was not associated with the school outcomes examined, suggesting that timing is not as important as factors such as attending school on reserve, parental education, and family residential school attendance.

Discussion

The purpose of this study was to examine the educational outcomes for young adults who were taught an Aboriginal language at school and did or did not currently speak an Aboriginal language. Based on findings from previous studies, we attempted to understand why a cohort of young adults did not demonstrate the positive language associations of younger aged cohorts despite using data from the same source: the Aboriginal Peoples' Survey 2001 and 2006 (Statistics Canada, 2003, 2008). To do this analysis, we explored several explanations including confounding variables, a cohort effect, as well as the timing and duration of Aboriginal language instruction.

The first possible explanation was an exploration of confounding variables and the possibility that previous studies on adults did not control for important confounding variables, such as family educational experiences and school attendance on reserve. Indeed, in this study, when we controlled for ever having attended school on a reserve, parental education, and family residential school attendance, speaking an Aboriginal language was not significantly associated with school outcomes, suggesting that Aboriginal language learning per se was not associated with negative school outcomes. This study highlights the importance of accounting for the appropriate variables that may service to confound the associations of Aboriginal language learning and school outcomes.

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Table 3. Logistic Regression Models Examining Association of Duration of Aboriginal Language Instruction with Young Adults' School Outcomes

	In or completed high school		Mostly "A"s in last year of school		Family school involvement	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Taught Aboriginal language in school for six or more grades						
No	*Ref.*	*Ref.*	*Ref.*	*Ref.*		
Yes	0.83 (0.55 - 1.26)	2.30 (1.30 - 4.10)**	0.67 (0.40 - 1.12)	0.97 (0.55 - 1.74)	2.06 (1.21 - 3.51)**	2.02 (1.12 - 3.65)*
Age (in years)		0.92 (0.87 - 0.98)**		1.02 (0.96 - 1.08)		1.05 (0.98 - 1.13)
Male		0.74 (0.54 - 1.02)		0.53 (0.37 - 0.78)**		1.08 (0.77 - 1.52)
Mother's education						
Mother did not complete high school		0.43 (0.29 - 0.65)***		0.77 (0.46 - 1.32)		0.59 (0.35 - 0.99)*
Mother completed high school		*Ref.*		*Ref.*		*Ref.*
Father's education						
Father did not complete high school		0.48 (0.32 - 0.72)***		0.85 (0.55 - 1.30)		1.09 (0.66 - 1.81)
Father completed high school		*Ref.*		*Ref.*		*Ref.*
Father education missing		0.33 (0.22 - 0.52)***		0.62 (0.34 - 1.14)		0.80 (0.49 - 1.32)
Attended school on reserve						
Never		*Ref.*		*Ref.*		*Ref.*
Ever		0.38 (0.25 - 0.58)***		0.70 (0.46 - 1.06)		0.96 (0.60 - 1.52)
Family residential school attendance						
No		*Ref.*		*Ref.*		*Ref.*
Yes		0.54 (0.39 - 0.75)***		0.66 (0.44 - 0.97)*		1.21 (0.82 - 1.80)

Note. Logistic regression coefficients with confidence intervals in brackets. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Table 4. Logistic Regression Models Examining Association of Timing of Aboriginal Language Instruction with Young Adults' School Outcomes

	In or completed high school		Mostly "A"'s in last year of school		Family school involvement	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Taught Aboriginal language in preschool or kindergarten						
No	*Ref.*	*Ref.*				
Yes	1.19 (0.70 - 2.04)	1.53 (0.82 - 2.84)	0.79 (0.42 - 1.46)	0.78 (0.38 - 1.62)	1.27 (0.78 - 2.07)	1.06 (0.61 - 1.86)
Taught Aboriginal language in Grades 1 to 6						
No	*Ref.*	*Ref.*				
Yes	0.53 (0.35 - 0.80)**	1.03 (0.61 - 1.74)	0.59 (0.39 - 0.91)*	0.71 (0.42 - 1.18)	1.20 (0.83 - 1.75)	1.12 (0.73 - 1.73)
Taught Aboriginal language in Grades 7 to 12						
No	*Ref.*	*Ref.*				
Yes	0.70 (0.47 - 1.05)	0.82 (0.52 - 1.31)	0.69 (0.42 - 1.11)	0.70 (0.41 - 1.20)	0.86 (0.58 - 1.27)	0.99 (0.65 - 1.52)
Age (in years)		0.93 (0.88 - 0.99)*		1.02 (0.96 - 1.08)		0.99 (0.97 - 1.01)
Male		0.74 (0.54 - 1.02)		0.52 (0.36 - 0.76)***		1.17 (0.89 - 1.53)
Mother's education						
Mother did not complete high school		*Ref.*		*Ref.*		
Mother completed high school		0.45 (0.30 - 0.68)***		0.78 (0.46 - 1.33)		0.68 (0.48 - 0.95)*
Father's education						
Father did not complete high school		0.50 (0.33 - 0.76)**		0.88 (0.58 - 1.34)		1.03 (0.69 - 1.53)
Father completed high school		*Ref.*		*Ref.*		*Ref.*
Father education missing		0.34 (0.22 - 0.53)***		0.64 (0.35 - 1.16)		0.99 (0.66 - 1.47)

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	In or completed high school		Mostly "A"s in last year of school		Family school involvement	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Attended school on reserve						
Never		*Ref.*		*Ref.*		
Ever		0.42 (0.25 - 0.71)***		0.93 (0.58 - 1.50)		1.14 (0.76 - 1.69)
Family residential school attendance						
No		*Ref.*		*Ref.*		
Yes		0.55 (0.39 - 0.78)***		0.71 (0.48 - 1.04)		0.94 (0.70 - 1.26)

Note. Logistic regression coefficients with confidence intervals in brackets.
* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Specifically, ever attending school on reserve, parental education, and family residential school attendance were associated with school outcomes. Ever having attended school on reserve, having a mother or father who had not completed high school, and having a parent or grandparent who had attended residential school were all associated with a lower likelihood of being in or having completed high school. Parental education has previously been associated with high school completion in both the general (Jimerson et al., 1999) and Aboriginal populations (Bougie et al., 2013). Similarly, family residential school attendance has been associated with children's school outcomes (Bougie, 2009; Bougie & Senécal, 2010). In this study, children who had ever attended school on reserve attended school on reserve for an average of 4.6 years. First Nations people living on reserve tend to live in more difficult socio-economic circumstances compared to First Nations people living off reserve, which may be associated with negative school outcomes.

The second possibility was the presence of a cohort effect, in which case the negative findings for adults in 2001 would not be replicated with a different cohort who were born at the same time as the children in the previous study. However, similar to the findings using 2001 data, before accounting for covariates, we found negative associations of being taught or speaking an Aboriginal language and school outcomes. Therefore, we cannot conclude that the differing findings for children and adults are due to a cohort effect. However, it is important to note that the children included in the study in 2001 were not followed longitudinally. Although our sample was born in the same time period, they are not the same children, and data from following a sample of Aboriginal children longitudinally into adulthood remains an area for future development.

Lastly, it is possible that differences in the school outcomes could be attributed, in part, to variation in the duration and/or timing of Aboriginal language instruction received by children and adults. Young adults who were taught an Aboriginal language for 6 or more years were more likely to be in or have completed high school and to have reported their families involved in the school. They were also more likely to be exposed to an Aboriginal language at home or outside of the home and to think that speaking or understanding an Aboriginal language was important. However, the timing of language instruction in elementary vs. high school was not associated with educational outcomes once the covariates were controlled.

Young adults who had been taught the language at school but could not speak an Aboriginal language were less likely to report receiving mainly "A"s on their last report card. Language is a subject to be learned, as with any other school subject. Students who did not learn the Aboriginal language in school with sufficient fluency to converse in the language (more than 2 or 3 words) may have been more likely to receive lower grades in other subjects as well. In this study, they were also less likely to have been taught an Aboriginal language for a long time (six or more grades) and also less likely to have an Aboriginal mother tongue compared to those who were taught an Aboriginal language in school and reported speaking it. There is also the possibility of differences in responding to the survey items. More nuanced questions that could be asked in future studies could further our understanding of the associations for this group.

Strengths and Limitations

This study has several strengths. The Aboriginal Peoples Survey is a population-based survey that is nationally representative of the off-reserve First Nations population in Canada. In addition, the breadth of variables available allowed the study to examine both speaking and being taught an Aboriginal language while controlling for important factors such as family educational experiences and school attendance on reserve. The consistency of survey content across years of data collection also enabled us to further understand a cohort from 2001. To our knowledge, this is also the first population-based study to examine the associations of the duration and timing of Aboriginal language instruction with school outcomes.

Although the study has many strengths, some limitations must be noted. The study is limited to off-reserve First Nations young adults. Future research could examine these associations for on-reserve First Nations young adults and adults of different ages. As well, all information reported is based on self-report (84%) or proxy reporting (16%). Information from multiple sources such as teachers, school report cards, and transcripts would add more information on school outcomes. In addition, school factors such as quality of Aboriginal language instruction or training of instructors would be an avenue for future research. Lastly, the data source is cross sectional and no assumptions should be made about causality. While examining the cohort at two cross-sectional time-points was a strength of this study, following children longitudinally and acquiring data on children's outcomes and educational experiences over time would contribute greatly to our understanding of how Aboriginal language influences educational outcomes.

Conclusion

In this study, we attempted to understand the discordance in the results of previous studies; that is, why young adults did not demonstrate positive associations between language and education outcomes as did younger aged cohorts. The three possibilities investigated were

a. Confounding variables,

b. A cohort effect, and

c. Differing timing and durations of Aboriginal language instruction.

Based on findings from the present study, confounding variables and duration of language instruction may contribute to the different findings for children and adults. Negative associations of being taught an Aboriginal language were not apparent after controlling for confounding variables, including family educational experiences and school attendance on reserve, which were not included in previous studies, indicating that consideration and selection of confounding variables is important. In terms of a cohort effect, before accounting for covariates, similar findings were found using 2012 APS data as had been found previously using 2001 APS data, with Aboriginal language negatively associated with school outcomes. Therefore, we cannot conclude that the differing findings for children and young adults were due to a cohort effect. Lastly, duration was important, but not timing. Being taught an Aboriginal language for six or more grades was associated with more positive educational outcomes for young adults. Future studies examining the association between speaking an Aboriginal language, being taught

an Aboriginal language in school, and school outcomes should consider family educational experiences, location of the school, and the duration of Aboriginal language instruction.

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