

The Effects of a Parent-child Reading Project on the Development of French Prereading Skills in Innu-speaking Kindergartners

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Abstract

This study assesses the effects of a parent-child reading project on the development of a variety of French prereading skills in Innu-speaking Kindergartners over the course of a school year. Phonological memory, expressive and receptive lexical knowledge, morphosyntactic knowledge, and basic arithmetic concepts were tested in two subgroups of a single cohort, one composed of participants in a parent-child reading project (experimental group) and the other composed of non-participants (control group). The results show that both groups made gains against French mother tongue age-level norms over the course of the year. The experimental group, whose members started the year with higher skill levels in a number of areas, improved more and on a greater variety of tasks than the control group. While the actual role the reading project played in the children's gains cannot be determined because of intertwining of factors, bringing books into homes and informing parents about the importance of reading likely had a positive effect on project participants.

Résumé

Cette étude examine l'impact d'un projet de lecture parent-enfant sur le développement des habiletés préalables à l'apprentissage de la lecture chez les enfants innus inscrits à la maternelle. Nous avons comparé les résultats obtenus par deux groupes d'enfants—un dont les membres participaient au projet de lecture (groupe expérimental) et un dont les membres ne participaient pas (groupe de contrôle)—à une variété de tâches en utilisant un protocole expérimental pré-test, intervention, post-test. Alors que les deux groupes ont fait de bons progrès au cours de l'année scolaire, rattrapant une partie de leur retard initial par rapport aux normes francophones, le groupe expérimental a fait des gains plus importants. Le rôle exact joué par la lecture dyadique dans ces gains n'a pas pu être mesuré avec précision à cause d'un croisement de facteurs, mais certaines indications nous laissent croire que l'introduction de livres dans les foyers des participants a eu des retombées très positives.

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Background to the Study

Innu youngsters, like many of Canada's First Nations children, frequently struggle in school. By the end of Grade 6, many lag several years behind provincial averages in reading, writing and mathematics, and high percentages leave school without obtaining a secondary diploma. Dropout rates for young aboriginals living on reserves are close to 70% in Quebec (Bergeron & Rioux, 2007; Institut culturel et éducatif montagnais [ICEM], 2007) and reach a staggering 90% in Labrador (Philpott, Nesbit, Cahill & Jeffery, 2005).

Some of the academic difficulties experienced by Innu children are attributable to their diglossic linguistic context in which two typologically different languages—Innu and either French (Quebec) or English (Labrador)—compete on an uneven footing. As the majority language slowly supplants the ancestral tongue in a growing number of domains of communication and as intergenerational transmission of Innu declines, many Innu children fail to acquire the lexical assets needed to provide a firm foundation for early literacy development in either language (Morris & MacKenzie, 2013).

Social factors common to many First Nations communities, including poverty, isolation, and substance abuse, may also impact negatively on school success. The financial and social precariousness of many home environments can result in sporadic school attendance and high rates of attention deficit disorder in the child population (Bergeron & Rioux, 2007; Philpott et al., 2005) and low literacy rates and low levels of engagement with schools in the adult population. Parental engagement can be additionally compromised by previous negative personal experiences with school (Levine, Sutherland, & Cole, 2012).

While many of the factors contributing to the poor academic performance of Innu children are not realistically amenable to change in the short term, it is our belief that intervening in a strategic and sustained manner within homes and classrooms throughout the initial years of schooling can significantly improve language and literacy skills while building critical bridges between parents and schools. What follows is an account of steps taken in that direction in an Innu community in Quebec through the implementation of a parent-child reading program targeting a group of Kindergartners and their parents.

Designing an Early Literacy Intervention Program for a First Nations Setting

A number of the literacy needs addressed in the present research were first identified in the course of a large-scale assessment of the literacy or pre-literacy skills of 600 Kindergarten to Grade 6 Innu children being schooled in French in Quebec (Morris & O'Sullivan, 2007). The children's performance on a variety of word knowledge, reading and writing measures revealed an acute need for lexical enrichment and increased print exposure across all grade levels. There was also orthographic evidence suggesting that the children's phonological representations of French words were lacking in accuracy.

The assessment process and the occasion it afforded to engage with Innu educators, parents and children allowed for the identification of a number of sine qua non conditions to ensure the viability of any intervention program implemented to meet the needs targeted. Cost effectiveness and long-term sustainability headed the list. Innu schools are

underfunded in comparison to their provincial counterparts. Some are also quite isolated, thereby limiting the number of visits researchers can make per year. Conditions for success also included being able to engage Innu parents in the intervention process and keep them engaged over time. Initiatives with no community support do not last long in any context. Additionally, creating a space conducive to parent-child interaction in both Innu and French was of critical importance to both researchers and their collaborators within the community, particularly given the endangered status of the ancestral language.

Taking into account both needs and constraints, we considered results from research related to the home and school development of early literacy skills with a view to identifying promising strategies for engaging young Innu children and their parents in activities aimed at building word knowledge, and heightening print and phonological awareness in both Innu and French.

Successfully Developing Prereading Skills in First Nations Settings

While a number of papers and reports speak of an acute need to improve literacy in First Nations contexts (see Council of Ministers of Education, Canada [2009] and McDonald [2011] for good examples), few propose concrete measures for achieving this goal and fewer still report results from either home-based or classroom-based early literacy development initiatives. Among the best-documented accounts of classroom interventions figure two studies conducted by Walton, who worked with a variety of different collaborators to improve phonological awareness in preschool and early primary populations in different communities in British Columbia. A study by Walton, Thorneloe, Bowden and Angus (2001) measured the effects of using a rime-based prereading program through two different experiments conducted with English-speaking Shuswap and Heiltsuk children at the Kindergarten and Grade 1 levels. The outcomes reported are positive, with the experimental population making gains on several different measures of phonological awareness, but both experiments have limitations that must be taken into consideration. The Kindergarten study involved a small number of participants (11 in the experimental group and 10 in the control group) and some very low results. The Grade 1 experiment involved the comparison of two quite distinct populations; the experimental group included 18 children in a single class receiving controlled rime-based classroom instruction, while the control group took in 42 children from a variety of different schools who might not have been receiving the same quality of teaching.

Similarly positive outcomes subject to similar caveats are reported in Walton, Canaday and Dixon (2010). In this experiment, the authors implemented song-based classroom activities (with a focus on rhythm and rime) over a 10-week period in a Kindergarten class. They reported enhanced phonological awareness and knowledge of grapheme-phoneme correspondences in their experimental group. While 32 children participated in the study, no indication is provided concerning how many were experimental subject and how many control subjects. Furthermore, testing seems to have keyed on what was being taught in the experimental group but not in the control group. In spite of these limitations, the cumulative evidence from both of the Walton et al. studies (Walton, Thorneloe, Bowden & Angus, 2001; Walton, Canaday & Dixon, 2010) seem robust enough to support the conclusion that systematically targeting the development of phonological awareness skills and sound-letter knowledge can lead to significant improvement in these areas.

The results reported from two large-scale longitudinal intervention projects, also conducted in British Columbia, similarly attest to the effectiveness of delivering consistent, scientifically-based teaching of early and later literacy skills in contexts with high percentages of at-risk children. The introduction of school-wide prereading and reading programs starting in Kindergarten in two schools of the Vancouver School Board with substantial numbers of First Nations children resulted in dramatic and rapid increases in the percentages of children meeting age-level literacy standards (Vancouver School Board, 2009). Similarly, the implementation of early literacy development and reading programs in District 44 of the North Vancouver School District resulted in a marked reduction of the number of at-risk first and second language children. Of the over 40% of second language children suspected of being at-risk following Kindergarten-level screening, only 1.5% remained at-risk by the end of Grade 6 (Siegel, 2009).

Although the interventions described above vary in terms of their target population, scope and duration, they all target key prereading skills in a direct and systematic manner, using explicit instruction which is sustained over time. Insofar as possible, we wished to implement a similarly direct and systematic approach in our own research context. While doing so within the classroom proved relatively easy, transplanting these characteristics into the home environment represented a greater challenge. To this end, we turned to research studying the effects of parent-child reading and interaction over print.

Engaging Parents in Prereading Skills Development

Although we could find no studies of parent-child reading in an aboriginal context comparable to our own, a substantial body of research, including studies conducted in low socioeconomic status contexts by Heath (1982), Anderson and Stokes (1984) and Neuman (1996), has indicated that there are clear child literacy development benefits to be derived from introducing more books and more hours of parent-child reading into households with previously low levels of both. In more recent years, some finer-grained studies of parent-child reading have afforded a more nuanced view of the types of literacy benefits that can be derived from such interaction and a clearer idea of how parent-child reading can be optimized. For instance, studies by Scarborough and Dobrich (1994) and Philips, Norris and Anderson (2008) showed that the baseline form of shared reading—that is, parents simply reading to their children without calling attention to textual features—has been found to contribute relatively little to overall literacy development. It is instead the quality of parent-child interaction over print that determines the extent of the benefits to be derived by children.

Pursuant to this line of inquiry, researchers intervening with at-risk populations in Canada (Hargrave & Sénéchal, 2000; Sénéchal, 2006; Sénéchal & Lefevre, 2002) and in the United States and Mexico (Bus, 2003; Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994) have assessed the impact of training parents in how to interact effectively with their children over print. In all of the aforementioned studies, time invested in training parents resulted in significant child gains in early literacy skills development.

More tangential to literacy development per se, but highly significant in terms of the potential impact of improving the quality of parent-child interactions, is research conducted by Fanning, Currin, Klein and Neville (2009) which compared electrophysiological measures of auditory attention and a variety of results from language and prereading skills

tasks in Kindergartners before and after an 8-week intervention period. In one group, the intervention was researcher led, but in the other trained parents interacted with their own children. Fanning et al. reported improved child attention and enhanced neurocognitive functioning in both groups, with the children in the parent-led intervention leading the way. The study has since been replicated in larger populations with equally positive results (Neville, Stevens, Klein, Fanning, Bell, Isbell, & Pakulak, 2011). In a similar vein, Wood (2002) found positive effects on a number of prereading skills, including phonological memory, when parents are trained to interact with their children through play and over print.

Intervening in a Diglossic Aboriginal Context

On the basis of the above findings, it can safely be argued that increasing both the quantity and quality of parent-child interactions in general and over print in particular would be beneficial to First Nations children. Less well documented is how to intervene optimally in a diglossic setting which includes an aboriginal language that functions as a language of communication in many households¹, that has been written and read by community members for generations, but that is not regarded, by community members, as a viable language of instruction beyond the preschool level². In such a context, arguments advanced in favour of developing oral rather than written literacy in the ancestral language (Webster, 2006) or in favour of using an aboriginal language as the language of initial schooling (Taylor & Wright, 2003) have no real currency. Our project was about intervening optimally within the existing educational framework and not about altering that framework. In the end, research exploring the cross-language transfer of early literacy skills proved highly useful, in particular work by Durgunoğlu, Nagy and Hancin-Bhatt (1993) that demonstrated the cross-language transferability of both phonological awareness and concepts of print. These results suggest that leaving the language or languages of parent-child interaction open to choice would be a safe and respectful course of action.

Thus, from research findings in the fields of early literacy skills development, parent-child reading and cross-language skills transfer, we laid down the foundations of an early intervention project designed to target key skills areas, particularly lexical knowledge and print awareness, as systematically and directly as possible. To reach into Innu homes effectively and respectfully, we offered both books and a training component to parents, and we supported reading initiatives in whatever language or languages parents chose to use.

¹ According to estimates established in conjunction with Innu-speaking Kindergarten teachers within the framework of a project measuring Innu skills (Morris & MacKenzie, 2012), approximately 10 to 15% of children in the community are being exposed to minimal or no Innu in the home environment.

² A pilot project described in Drapeau (1992) launched in the 1980s proved unsustainable for lack of parental backing and no attempt has been made since to use Innu as a language of instruction beyond the preschool level.

Objectives and Research Questions

The parent-child reading program had three main objectives. The first was to enrich the lexical universe of Innu children in French and Innu with a view to facilitating subsequent literacy development in both languages. The second was to engage parents in print-centred activities with their children. The third was to create a sustainable, cost-effective and unobtrusive method of getting books into homes and delivering basic information about bilingualism and literacy development to Innu parents. In terms of research questions, we wished to determine what impact parent-child reading would have on child performance on a variety of prereading skills, including measures of phonological and verbal memory, and word knowledge. To this end, an experimental design, including a pre-test, intervention and post-test, was adopted. The matter of having experimental and control groups was a delicate one. Asking a group of parents not to read to their children over the course of the study was not a viable option. In the end, we offered training in reading to children and books to all parents of Kindergartners and formed a control group using the children of parents who opted not to participate.

Methodology

Participants

The results analyzed here come from 32 children, 20 of whom were read to by their parents and 12 of whom were not. Table 1 provides a summary of relevant demographic information. Participating children had started school at age four, spending half days in pre-Kindergarten classes taught exclusively in Innu. Over the course of their Kindergarten year—the year targeted by this study—they were in school all day and received instruction split fairly evenly between Innu and French. Within the classroom setting, the teachers—all qualified professionals and Innu-French bilinguals—read to the children daily, taught letter sounds and names, worked on age-appropriate concepts and introduced new words in French and Innu.

Information regarding parents was collected from mothers only. Since mothers assumed the bulk of reading duties in the experimental group and since various studies have found levels of maternal education to correlate significantly with different measures of child cognition (Baydar, Brooks-Gunn, & Furstenberg, 1993; Noble, McCandliss, & Farah, 2007), we felt that limiting data collection to them would be acceptable. Information gathered from mothers included levels of education (as measured in years of formal schooling) and language dominance (more Innu than French, a balance of Innu and French, more French than Innu). The experimental and control groups proved to be highly comparable in terms of language use, with approximately 90% of mothers in both groups declaring Innu as their dominant language. In contrast, mothers in the experimental group had spent an average of 10.95 years in school while those in the control group averaged 9.08 years of schooling. A Mann-Whitney test reveals this difference to be significant ($U(32) = 39.50, Z = -3.37, p = .001$).

Table 1

<i>Participant Demographics</i>							
Experimental Group				Control Group			
Boys	Girls	Age	Mat. educ.	Boys	Girls	Age	Mat. educ.
11	9	6.10	10.95	6	6	5.96	9.08

Tracking Skills Development

Child testing was conducted using the French test battery *Nouvelles épreuves pour l'examen du langage* (N-EEL) (Chevrie-Muller & Plaza, 2001)³. This test was chosen because it covers children from 3 years 6 months to 8 years of age, making it suitable for tracking our population across the first three years of the project with a single kit. Furthermore, the test is modular in composition, allowing for the extraction and use of certain tasks. Time constraints limiting the assessment window to 40 to 45 minutes per child precluded the possibility of using the full age-level battery. The tasks selected for use were chosen because they measured skills known to play an important role in later literacy development and because the children in the target population proved able to complete them early in their Kindergarten year. An initial attempt was made to include rime and initial phoneme identification tasks from the same test, but these proved too difficult for the children. Table 2 summarizes the tasks selected from the N-EEL battery.

Tracking Book Borrowing

Parental participation was measured by totalling the number of books borrowed through the reading project or purchased through a school book-buying program between the pre- and post-test dates⁴. As the project advanced, we realized that we could also gain insight into how parent and child book preferences were developing over time through our tracking of titles borrowed or purchased, and through the conversations that were occurring between parents and the local project coordinator overseeing exchanges of books. In this way we learned more about how parents and their children were reacting to the books they were borrowing or buying. Detailed information concerning titles borrowed or purchased will not be reported here but some references will be made concerning the borrowing patterns observed.

³ When the project was started, no instruments were available for assessing children in Innu. Since that time, instruments have been created and are currently being validated in several Innu communities.

⁴ Since appealing, nicely illustrated children's books in Innu are very few in number the books purchased for the project were in French. All children's books in Innu available in the community were also offered to parents but these were rarely, if ever, borrowed.

Table 2

Summary of N-EEL Tasks Used in Assessment

Skills area	Task
Memory	Repetition of rare words: span Number repetition Sentence repetition
Morphosyntax	A: Reversibility of active sentences, contraction <i>à la (s)/aux (pl)</i> , subject pronouns B: Reversibility of active sentences, contraction <i>à sa (s)/aux (pl)</i> , subject pronouns
Arithmetic concepts	Topological concepts Ordinal concepts Relative quantity
Expressive Vocabulary	A. Naming concrete objects B. Naming colours, shapes, body parts
Receptive Vocabulary	A. Designation of concrete objects B. Designation of colours, shapes and body parts

There was no means of verifying exactly how the books were used in homes without being unduly intrusive for an aboriginal context. The assumption was that borrowed books were likely being read to children, particularly in light of the children's growing eagerness to make their own book choices as the school year progressed. No attempt was made to calculate the number of children's books already present in Innu homes prior to the start of the study. Books for pleasure reading are rare commodities in the community and local Innu research partners did not believe that questioning parents about the number of books in their homes would be useful. The target community has no public library. The only libraries are found in the primary and secondary schools, and parents do not have access to these facilities. In all likelihood, the books borrowed and purchased by parents in the course of the first year of the project represent close to the real total of books their children were exposed to at home during that time.

In all, 230 books entered the homes of project participants between October and May, an average of 11.5 per participant. The least assiduous readers borrowed a minimum of three books and the most assiduous borrowed and/or bought a total of 23 books. The standard deviation calculated (6.90) reflects the high variability in levels of book borrowing.

Child Assessment

The pre-test was conducted at the beginning of October and the post-test was done in early May. Two experienced French-speaking testing professionals administered the

tasks, assisted by Innu speakers whose responsibility it was to translate task instructions when required. The translators intervened only when testing ground to a halt and children sat in silence. This only happened on a few occasions on the pre-test and on a single occasion on the post-test. When children seemed incapable of performing a particular task in French, the task was translated into Innu to determine if the child's problem was lexical or conceptual in nature. Occasionally, children were able to display knowledge of a word in Innu, but not in French. Evaluators noted the success in Innu but recorded these results separately from the performance in French. The results reported below reflect the children's responses in French only and therefore underestimate their overall abilities.

Results

Results from the child testing component were first calculated by simply totalling the points amassed by the children on the 12 tasks administered at each test time. These figures are presented in Table 3.

Since all of the children were receiving classroom instruction in many prereading skill areas, the expectation was that they would all make instruction-related gains in many of the areas assessed over the course of the school year. In addition, maturation gains, independent of any instructional effect, could be expected; over a 6-month stretch, 5- and 6-year-olds simply get better at certain tasks regardless of teaching or home literacy practices. The parent-child reading program, if effective, would provide gains in addition to those attributable to teaching and maturation.

Table 3

Pre-test and Post-test Results for Experimental and Control Groups

Task	Experimental				Control			
	Pre-test		Post-test		Pre-test		Post-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Word repetition	6.65	2.03	7.90	1.17	5.25	1.55	6.42	1.88
Number repetition	4.30	2.00	4.60	1.50	3.00	2.26	2.92	1.56
Sentence repetition	28.15	4.46	41.45	2.76	23.83	6.39	26.42	7.01
Morphosyntax A	.75	.75	.75	.62	1.00	.97	1.20	.89
Morphosyntax B	1.55	.89	1.75	.97	1.25	1.14	1.33	.98
Arith. – topology	6.60	2.64	10.60	1.76	5.33	3.45	9.25	2.42
Arith. – Ordinals	5.40	2.35	7.40	2.35	2.50	2.11	5.33	2.61
Arith. – quantities	2.90	.85	3.60	.68	2.33	1.44	3.00	1.13
Expressive voc. A	18.80	4.35	23.75	3.80	17.25	3.65	20.67	4.77
Expressive voc. B	24.35	5.07	29.00	4.08	20.00	7.45	25.67	4.16
Receptive voc. A	26.00	4.32	28.50	3.07	22.08	5.09	24.92	4.93
Receptive voc. B	14.75	2.29	17.90	1.62	12.67	2.90	16.08	2.57

Since the distribution of results was asymmetrical and the population small, non-parametric analyses were used to identify significant differences. Pre-test and post-test results were compared in both the experimental and the control group using a Wilcoxon Signed Ranks Test. The control group showed significant improvement on six of the 12 tasks, including topology [$W(12) = 73.50, Z = 2.71, p = .007$], ordinals [$W(12) = 53.00, Z = 2.64, p = .008$], expressive vocabulary A [$W(12) = 67.50, Z = 2.25, p = .025$], expressive vocabulary B [$W(12) = 54.00, Z = 2.71, p = .007$], receptive vocabulary A [$W(12) = 58.00, Z = 2.23, p = .026$], and receptive vocabulary B [$W(12) = 63.50, Z = 2.73, p = .006$]. The experimental group matched the control group's significant gains in topology [$W(20) = 201.00, Z = 3.60, p = .000$], ordinals [$W(20) = 125.00, Z = 2.34, p = .019$], expressive vocabulary A (concrete objects) [$W(20) = 136.00, Z = 3.52, p = .000$], expressive vocabulary B (body parts, shapes and colours) [$W(20) = 168.50, Z = 3.63, p = .000$], receptive vocabulary A (concrete objects) [$W(20) = 162.50, Z = 3.38, p = .001$], and receptive vocabulary B (body parts, shapes and colours) [$W(20) = 166.00, Z = 3.52, p = .000$]. In addition, the experiment group made significant gains on the quantities task [$W(20) = 93.00, Z = 2.69, p = .007$], and on two of the three memory tasks: word repetition [$W(20) = 116.00, Z = 2.54, p = .001$], and sentence repetition [$W(20) = 149.00, Z = 2.78, p = .006$].

While the children of the experimental group improved significantly on more tasks than those of the control group, the pre-test results reveal that they also started from a higher level on all but one of the tasks. To assess the gains made by the experimental group above and beyond those of the control group, the significance of the gap between the two groups was measured at both test times using a Mann-Whitney test. Significant pre-test differences were found between the control and experimental groups on the sentence repetition task ($U = 68.00, Z = 2.04, p = .042$), the ordinals task ($U = 45.00, Z = 3.00, p = .003$), the receptive vocabulary A task ($U = 63.50, Z = 2.21, p = .027$) and the receptive vocabulary B task ($U = 68.50, Z = 2.02, p = .044$). On the post-test, the significant difference was maintained on the sentence repetition task ($U = 61.50, Z = 2.30, p = .021$), the ordinals task ($U = 67.00, Z = 2.12, p = .040$) and the receptive vocabulary A task ($U = 65.00, Z = 2.16, p = .032$). The difference had disappeared on the receptive vocabulary B task, but new differences emerged on the word repetition task ($U = 63.50, Z = 2.27, p = .026$), the number repetition task ($U = 51.50, Z = 2.71, p = .007$), and on the expressive vocabulary B task ($U = 69.50, Z = 1.99, p = .048$).

The pattern revealed by these analyses is one of the experimental group widening the gap over the control group between the pre- and post-tests, particularly by pulling away on the three memory tasks (word, number and sentence repetition). This tendency will be explored in more depth in the discussion section.

The next analyses conducted were correlational in nature. The control and experimental groups differed not only in terms of the number of books read with a parent over the course of the school year, but also in terms of the number of years mothers had spent in school. A Spearman rho analysis was used to determine the extent to which the children's pre-test and post-test results correlated with these two factors. The results are reported in Table 4.

Table 4

Correlations Between Years of Maternal Education, Number of Books Read and Pre-test and Post-test Results

Task	Maternal Education		Books Read	
	Pre-test	Post-test	Pre-test	Post-test
Word repetition	.59**	.47**	.35	.28
Number repetition	.48**	.48**	.27	.36*
Sentence repetition	.54**	.44*	.35*	.31
Morphosyntax A	-.06	.21	.03	.32
Morphosyntax B	-.06	.24	.22	.33
Arithmetic – topology	.23	.23	.21	.32
Arithmetic – Ordinals	.31	.42*	.52**	.41*
Arithmetic – quantities	.30	.39*	.24	.23
Expressive vocabulary A	.34	.30	.33	.34
Expressive vocabulary B	.25	.28	.33	.37*
Receptive vocabulary A	.38*	.24	.46**	.38*
Receptive vocabulary B	.27	.38*	.33	.32

* $p < .05$, ** $p < .01$

Neither the number of books read nor levels of maternal education would seem to correlate in a convincing manner with post-test scores independently of pre-test scores. Given the small test population, the general weakness of the correlations observed, and the lack of refinement of both measures used, no attempt was made to tease apart the relative contribution of each of these factors.

The final analysis of results was designed to situate the performance of the Innu children of the control and experimental groups with respect to age-adjusted French mother tongue norms on the N-EEL. Given that low socioeconomic status, second language children often start school with substantial lexical and morphosyntactic deficits, intervention programs urgently need to improve the skills of the children to the point where they are closing the gap on mother tongue children and not falling further behind them. To this end, the percentage of children in each group achieving a score falling within one measure of standard deviation of the mother tongue, age-adjusted average was calculated at each test time. This very stringent distance from the test norms set the bar very high for any population and particularly for a group of low socioeconomic status second language speakers. This was a deliberate decision; we wished any success measured to be unquestionable and unqualified. The results of this analysis are reported in Table 5.

Table 5

Percentage of Results Within One Measure of Standard Deviation of the French First Language Age Norm

Task	Experimental		Control	
	Pre	Post	Pre	Post
Word repetition	55	85	33	50
Number repetition	60	70	58	33
Sentence repetition	25	40	17	17
Morphosyntax A	60	70	58	73
Morphosyntax B	60	50	45	33
Math: topology	10	55	8	25
Math: ordinals	35	65	17	25
Math: quantity	35	70	42	50
Expressive vocabulary A	30	40	8	25
Expressive vocabulary B	15	45	8	17
Receptive vocabulary A	30	55	8	33
Receptive vocabulary B	25	55	8	33

For the control group, more children fell within a single measure of standard deviation of the norm on the post-test than on the pre-test on all of the measures except for the number repetition task and the second morphosyntactic measure. On the sentence repetition task the pre- and post-test percentages were identical. The experimental group closed the gap on first language test norms on all measures but one, the second morphosyntactic task. These results corroborate those presented in Table 3 above. While the cohort as a whole made good progress between the pre-test and post-test, higher percentages of children in the experimental group moved to within one measure of standard deviation of test norms, and they did so on a greater variety of tasks.

Discussion

The results suggest that teaching contributed significantly to the development of pre-literacy skills in both groups, allowing the children to progress beyond rates predicted by mere maturation. The impact of teaching is best isolated in the control group. Here, the children can be seen to make significant lexical progress over the course of the school year, as well as gains in several measures of topological and ordinal arithmetic concepts. The decreased percentages of at-risk children on a number of tasks by the end of the year when age-adjusted averages and standard deviations are used attest to the fact that more than simple maturation is at work.

The exact nature of the gains being made in the control group is hard to determine. The children quite clearly picked up more words between the pre-test and post-test, but whether the gains on the topology and ordinals tasks are lexical or conceptual in nature remains a moot point. While first language speakers are expected to have acquired the lexical items found in the topology, ordinals, and quantities tasks by age five, the same is

not necessarily true for young second language learners. The very weak performance of the Innu children on these tasks on the pre-test suggests that many of them did not possess key words. It is possible that once these words had been taught in school, the children were able to display knowledge of the concepts that were being tested. Whether the children learned new concepts along with new words in French or acquired the French words for concepts they already possessed is unclear. What is for more apparent is the extent to which lexical and conceptual knowledge intertwine, and the impact weak word knowledge in the language of instruction can potentially have across the curriculum.

Lexical weaknesses may have taken a toll on morphosyntactic results as well. Scores on the two morphosyntactic tasks do not rise above at chance levels of accuracy over the course of the school year. Various researchers, including Droop and Verhoeven (2003), studying children older than our population, and Jackson (2008), studying highly educated adults, have found morphosyntactic abilities to correlate significantly with lexical knowledge or general proficiency in the second language. Presumably the same constraints hold true for much younger and less proficient second language speakers. It may well be that the vast majority of children in the study had not yet reached a level of lexical proficiency in French that allowed them to attend to morphosyntactic subtleties.

The focal point of this study, the impact of the parent-child reading program on prereading skills development of Innu children proved difficult to assess with any degree of precision. While the children in the experimental group made greater gains over the school year than those in the control group, the relative lack of refinement of the measures used—the number of books read and the number of years of maternal education—renders fine-grained analysis impossible. Furthermore, the two factors overlap to a large degree since mothers with more years of schooling cluster in the experimental group. Teasing apart years of schooling and book reading is simply not possible with the data available.

Even with more refined data, looking at years of schooling and book reading as completely separate factors might not be a wise choice. As the project unfolded and participating mothers attended reading workshops, began to ask for titles by certain authors and started buying books, it occurred to us that participation in the reading project was enhancing mothers' overall personal experience with print and reading, and that this might be being transmitted to children in addition to the stories being read. Several studies, including that of and Snow, Barnes, Chandler, Goodman and Hemphill (1991) have found that greater maternal contact and ease with print results in more effective parent-child interactions.

The nature of the gains made by the children in the experimental group merits discussion. While both the control and experimental groups made significant lexical progress over the school year, the experimental group made unmatched gains on the three memory tasks. The stronger lexical knowledge of the experimental group children may have had a facilitating effect on the sentence repetition task, but lexical knowledge would be unlikely to account for the superior performance of the experimental group on the word repetition task, where very rare words, unknown to the children, were used, or on the number repetition task, in which only numbers from 1 to 10 were used. Perhaps parent-child interactions over print had a positive effect on these memory tasks. Previously mentioned research by Fanning et al. (2009), Neville et al. (2011) and Wood (2002) has found memory and attention to be particularly amenable to positive change through joint parent-child activities.

Finally, the gains the children made relative to the test norms deserve attention. While both groups made up ground over the course of the year, the gains of the experimental group were particularly impressive. Far lower percentages of children who were being read to by their parents could be considered at-risk by the end of the year. Whether the parent-child reading was a major contributing factor cannot be determined on the basis of the data available, but the extent to which children in the experimental group gained on French mother tongue norms over a school year in which they were taught in both Innu and French leaves room for guarded optimism regarding the future of the children and their ancestral tongue.

Conclusions

Our results show that classroom teaching improved the overall performance of the complete cohort of Kindergarten children under study, particularly in receptive and productive vocabulary measures. Gains beyond what could be expected through simple maturation were clearly evident in both groups and particularly visible in the control group, which did not benefit from the shared reading intervention. The experimental group receiving the parent-child reading treatment made greater lexical gains than the control group and also improved on different measures of memory. Most importantly, both the experimental and the control groups closed the gap on mother tongue norms on a variety of measures, as higher percentages of children were found to be within a single measure of standard deviation of age-level standards across tasks on the post-test than on the pre-test. In the case of the experimental group, the rise in percentages of children who could be considered not at-risk on various measures by the time of the post-test was particularly striking. Although the cohort still lagged considerably behind French mother-tongue norms at the end of the school year, their French skills profile as they exited Kindergarten was considerably more positive looking than when they arrived. Furthermore, the closing of the gap on mother tongue norms was done while the children spent half of every school day in Innu, confirming that First Nations children do not have to relinquish use of their aboriginal language to succeed in a majority language.

Although the study was designed with a view to measuring the impact of the parent-child reading program on the development of a variety of pre-literacy skills, it turned out that the experimental group was heavily dominated by those mothers with the most years of formal education and that those years correlated significantly with the number of books read. In the end, the influence of the number of years of maternal education and the amount of reading done largely intertwined, with the number of years of maternal education ultimately correlating more strongly with task results than the number of books read. It is therefore impossible to conclude that the gains observed in the experimental group are attributable to the shared reading that occurred over the course of the project. This said, it is not clear that the same results would have been achieved had the more educated mothers not participated in the reading project and gained knowledge, pleasure and confidence while interacting with their children over print.

The study is limited by the small number of participants involved and by a lack of information concerning the actual shared reading practices of parents who borrowed or bought books. Using the number of books borrowed and bought proved to be a less than optimal way of documenting the implementation of parent-child reading. However, more invasive measures of documenting how books were being used or of measuring parental

knowledge of books and authors would likely have resulted in a hostile parental reaction the complete failure of the project.

Even though the unique contribution of the parent-child reading program to the success of the children could not be determined, we would argue in favour of its maintenance and expansion on the grounds that in the worst case scenario it did no harm and in the best case scenario had a very positive effect in the community. By June of the initial year of operation of the project a collection of books purchased in the fall was left dog-eared from use and had to be replenished, and parents were buying books on their own. Since the completion of the study, the community has gone on to create a Reading Centre outside of the school, which remains open in the summer, and to launch a summer reading camp. It would appear as though the goal of sustainability has been achieved.

While changing overall parental levels of education in aboriginal contexts is a long-term, complex undertaking, informing parents about the importance and the pleasures of reading to children, showing them how to get started, providing them with good books, and applauding their efforts are imminently achievable objectives, and ones which, according to our experience, are likely to contribute positively to many lives.

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