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**The Cognitive and Academic Benefits of French Immersion Education: A Research Note
and its Implications for Educational Policy**

Ladies and gentlemen of the Standing Senate Committee and my esteemed colleagues:

My sincere thanks to the Standing Senate Committee on Official Languages, first, for its diligent work on behalf of all Canadian citizens and particularly, its younger learners in our schools across the country. Second, my sincere thanks for the opportunity to address the Committee today as you tackle the important topic of access to French Language schools and French Immersion programs in British Columbia. Thank you for the opportunity to speak with you in my mother tongue, English. My additional languages are German and Japanese, but my French is not yet at a level where I'd be confident to address you credibly. Soon, I hope.

I understand that members are particularly interested in hearing about research on and teaching in French schools and immersion programs in BC. Therefore, I propose to offer a short summary of a study that I carried out in collaboration with my dear colleague Dr. Monique Bournot-Trites some time ago, in the late 1990s, in a French Immersion program here in BC. After telling you the story of our study, I will conclude my remarks with several implications of that research that I hope might be of use to policy makers and educational planners in addressing the question of access to French Immersion programs and their well-documented benefits to learners.

The Research: Intensity of Second Language Instruction in the Intermediate Years of French Immersion and its Impact upon Bilingual Proficiency and Mathematics Performance.

The story begins one evening at a parent's meeting in my two children's local elementary school in Vancouver, where the whole school is devoted to offering a fine Early French Immersion program that ran from Kindergarten to Grade Seven. Like all Early FI programs in Vancouver, the program began with 100% French instruction in the first few years, introduced English Language Arts by the third grade, and by fourth grade introduced a number of additional subject areas taught in English, including Mathematics, Computer Studies, and often, Physical Education, with the result that only about half of the instructional hours for grades four through seven were being delivered in French. The

principal proposed to parents that the school increase the proportion of French language instruction by continuing to deliver Mathematics in French, since the current English-language textbooks were approaching the end of their useful lives and had to be replaced in any case. Now the very fact that our children were receiving what could generously be termed a bilingual French-English curriculum and nowhere near an “Immersion” program met with considerable surprise: none of us had done an analysis of the language of instruction in those middle school years, yet many of us had chosen the school’s neighbourhood for access to this FI program, and all of us had made significant efforts to register our children in the program since places were limited.

The initiative met with near unanimous support from parents and school staff alike, and the initiative was phased in around 1995 at the fourth grade in the school, and extended year-by-year to succeeding fourth-grade classes until all intermediate years enjoyed what came closer to a 75% French, 25% English program. We calculated that children in the new, intensified FI program would receive close to an additional 1000 hours of academic experience in French over the life of the program, when compared to their counterparts who had taken part in the earlier, 50% French / 50% English delivery model in the middle years.

Staff had in their own early discussions of the proposal expressed concern that the intensified English program would achieve several specific goals:

1. The intensified French Immersion program should result in enhanced French language and literacy proficiency;
2. The intensified program should not come at a cost to English literacy proficiency;

Those goals were adopted by staff and parents alike.

Flash forward to a year following the implementation of the intensified FI program, the parents asked for consideration of an interesting, third goal, which was also adopted by the school:

3. Mathematics instruction in French should not come at a cost to Mathematics performance and should not put those students at a disadvantage in the event they needed to change in later school years to Mathematics delivered in English.

The principal’s proposal to the parent group quickly led me to a conversation over coffee and dessert with the principal about how the school planned to assess whether the intensified French program would meet those stated goals, and it was quickly agreed that I would investigate ways of developing an unobtrusive but rigorous joint UBC-Vancouver School Board study of students’ linguistic, literate and, as it would later turn out, mathematics performance over the course of several years of the program’s implementation.

In collaboration with my colleague Dr. Bournot-Trites and with the assistance of a Hampton research grant from UBC and a team of talented graduate students who kindly agreed to mostly work for free, we were able to study the new program from its initial implementation in its first fourth-grade class of 36 students through to those students' completion of the program in their seventh grade. Moreover, we were able with the cooperation of the school staff, to assess not only the new program members' French and English Proficiency in each year, but also the previous years' classes, 30 in all, who were still working under the 50/50 model through to their school completion at grade seven, and thereby obtain year-by-year comparisons at grades four through seven. For mathematics performance, we were able to assess those 36 students in the new intensified program at grades six and seven, and compare their performance to that of their 30 counterparts in the earlier program at the same grades.

What were some of the things we learned by the end of those five years of grade-by-grade comparisons of the two program groups?

First, with regard to the first goal for the intensified, 75% FI program, enhanced French language and literacy, we discovered that students in the intensified program outperformed those in the 50% French program and this was particularly the case in our teacher-led assessments of academic and descriptive French written expression across all the grade levels.

Second, concerning the second goal for the intensified French program, no harm to English literacy proficiency, we found no differences between the 50% French students and the 75% French students' performance, except in the case of academic English reading skills: the students who had 50% of their instruction in English, taking Maths through English, slightly outperformed those who were receiving 25% of their instruction in English. It is worth noting however that despite this difference, both program groups were achieving at levels in the top echelon in the province according to province-wide achievement tests administered in their seventh-grade years.

With respect to the third goal, equivalent Mathematics performance, the intensified FI group who continued Mathematics experience in French massively outperformed the group who received Mathematics in English, when they were both tested by means of the English-language Stanford Diagnostic Mathematics Test. This advantage was evident in every facet of the test, whether numerical concepts, computation, applications in problems, or on average across these facets of Math ability. Hence, not only was the goal of "no harm" met, there appeared to have been, by the end of the four years' experience of a thousand hours of additional instruction in a second language, a remarkable academic advantage, even when assessed in an English-medium test.

So, we were able to conclude that intensifying instruction in French in the middle school years not only causes no harm to French or English language and literacy proficiency, or to Mathematics performance, but also has the strong possibility of yielding benefits to French

academic language performance as well as to Mathematics performance. And the latter benefit of what I've been calling intensified French Immersion instruction to a core academic subject holds in spite of language of assessment.

Our conclusions of course bore out earlier findings regarding the cognitive and academic benefits of French Immersion education by Cummins, Swain, Lapkin and others in Canada. It also helped us provide some definition to what has been called the Threshold Hypothesis put forward years ago by Jim Cummins of the University of Toronto. Briefly, it states that if a certain threshold proficiency in two languages is reached by learners, their academic and cognitive performance will be enhanced in both those languages. One of the difficulties had been that no-one had ever been able to determine in practice what that threshold of "strong bilingualism" looked like. Our little study however, caught a glimpse, although indirect, of that threshold: it involved the impacts of those thousand hours of second language experience for our 36 students. Whatever had been happening in those thousand hours was sufficient to propel those students across the threshold of what Cummins calls the threshold for strong bilingualism.

If we are to realize the cognitive and academic benefits of using two (or more) languages, it appears that educators need to set ambitious goals for education in and by means of our two official languages of Canada. Our little research story teaches us, as has Cummins before us, that intensive language experience is a necessary condition for strong proficiency.

What, then, are some of the implications of my story for policymakers and planners for Canadian education? Most of these appear to centre on just how ambitious we wish our aims for education are to be.

1. For French Immersion education to realize its potential as demonstrated in the Thousand Hours study in Vancouver, it is insufficient to reduced intensive French exposure to little more than half-time, as is the norm in many schools today across the country (with notable exceptions like North Vancouver or Coquitlam, BC.)
2. Because a common rationale for reducing French language instruction in French Immersion is that students must be prepared for eventual instruction and assessment in English (in later school years, or in postsecondary education, etc.), teachers need to learn that *strong* bilingual learners can thrive academically in both their languages.
3. A further rationale we've often heard in conversation with administrators for reducing the intensity of French in French Immersion programs is a shortage of content area teachers for the middle and later school years who have strong French language proficiency. If we are to be sufficiently ambitious, we need hard data on teacher supply in those key middle and upper school years, and, if indicated, some informed planning to train and recruit those teachers.

I have always believed, along with the poet Goethe, that one who does not know another language does not truly know his or her own language.

Thank you once again for the opportunity to offer this testimony.

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Biographical note

Kenneth Reeder is Professor Emeritus of Language and Literacy Education at the University of British Columbia. His research program includes studies of the appropriate uses of technology in language teaching and learning, educational and applied linguistics and first and additional language acquisition.

Kenneth Reeder est professeur de langue et de littérature à l'Université de la Colombie-Britannique. Son programme de recherche traite des technologies appropriées pour l'enseignement et l'apprentissage des langues, la linguistique appliquée/éducative, et l'acquisition de la langue maternelle et seconde.

Appendix

Interdependence Revisited: Mathematics Achievement in an Intensified French Immersion Program

Monique Bournot-Trites and Kenneth Reeder

Abstract: This study examines the effect of teaching mathematics in French on mathematics achievement evaluated in English. In this context it analyzes the effect of increased intensity of bilingual education on mathematics achievement. It also analyzes the effects of language of testing in the context of French immersion at the intermediate level. The participants in the study are two cohorts of French immersion pupils followed from Grades 4–7. The treatment group received 80% of the core academic curriculum, including mathematics, in French and 20% in English. The comparison group received 50% of the core academic curriculum in French and 50%, including mathematics, in English. Achievement in mathematics was measured for both groups at the end of Grade 6. Analyses of covariance showed an advantage in mathematics for the 80% French group compared to the 50% French group. These results provide further evidence for Cummins' threshold hypothesis and interdependence hypothesis.

Résumé : Cette étude examine l'effet de l'enseignement des mathématiques en français sur le rendement en mathématiques évalué en anglais. De plus, elle analyse les effets d'un programme bilingue intensifié sur le rendement en mathématiques. L'étude analyse aussi l'influence de la langue dans laquelle l'évaluation est faite, dans le contexte de l'immersion française au niveau intermédiaire. Les participants à l'étude sont deux cohortes d'élèves d'immersion française suivies de la quatrième à la septième année. Le groupe expérimental a reçu 80 % de l'enseignement de son programme académique, y compris les mathématiques, en français et 20 % en anglais. Le groupe de comparaison a reçu 50 % de son programme académique en français et 50 %, y compris les mathématiques, en anglais. Le rendement en mathématiques des deux groupes fut mesuré à la fin de la sixième année. Les analyses de covariance ont montré un avantage en mathématiques pour le groupe recevant 80 % de son enseignement en français comparé au groupe recevant 50 % de son enseignement en français. Les résultats supportent les hypothèses de seuil et d'interdépendance de Cummins.