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Linguistic, Academic, and Cognitive Benefits of French Immersion

Wally Lazaruk

Abstract: A survey of research on French as a second language (FSL) education in Canada suggests that French immersion (FI) students enjoy significant linguistic, academic, and cognitive benefits. We organize our summary of the advantages of FI around these three themes, comparing students' proficiency in French and English across various FI programs, and assessing their overall academic achievement. Our review shows that FI programs enable students to develop high levels of proficiency in both French and English, at no cost to their academic success. Cognitive research associates bilingualism with heightened mental flexibility and creative thinking skills, enhanced metalinguistic awareness, and greater communicative sensitivity. Because cognitive benefits are contingent on a bilingual learner's proficiency in both languages, it may be that FI programs, which promote heightened proficiency in both French and English, foster in their students an underlying cognitive advantage.

Keywords: French immersion; bilingualism; language and cognition; language learning; FSL education

Résumé : L'examen des recherches sur l'enseignement du français langue seconde (FLS) au Canada donne à penser que les élèves en immersion française (IF) en retirent des avantages linguistiques, scolaires et cognitifs considérables. Dans notre sommaire, nous avons regroupé les avantages d'IF sous trois thèmes, comparant la maîtrise du français et de l'anglais des élèves inscrits à divers programmes d'IF et évaluant leur rendement scolaire en général. Notre examen démontre que les programmes d'IF permettent aux élèves d'atteindre des niveaux élevés de maîtrise du français et de l'anglais, sans que leur rendement scolaire n'en souffre. La recherche cognitive associe le bilinguisme à une plus grande souplesse mentale, une pensée plus créative, une meilleure conscience métalinguistique et une plus grande sensibilité communicative. Parce que les avantages cognitifs sont fonction de la maîtrise des deux langues par l'apprenant bilingue, il se peut que les programmes d'IF, qui favorisent une meilleure maîtrise du français et de l'anglais, génèrent chez les élèves un avantage cognitif sous-jacent.

Mots clés : Immersion française; bilinguisme; langue et cognition; apprentissage des langues; éducation en FLS

Introduction

A review of literature on French as a second language (FSL) education in Canada suggests that French immersion programs offer their students significant linguistic, academic, and cognitive benefits. This article pursues these three themes, with reference to some key studies that have emerged over the last 40 years. Following a brief introduction to the teaching of French in Canada, we discuss the extent to which French immersion programs can support students' enhanced proficiency in French. We explore the gap between receptive and productive language skills in graduates of immersion programs, investigate the benefits of intensive instruction, and ask to what extent immersion offerings at the high school level help to further improve immersion students' French language proficiency. In the article's second section, we turn to English proficiency and academic achievement among students of immersion programs. Most of the studies encountered here suggest that French immersion programs in Canada foster additive bilingualism, so that learning a second language (L2) in no way compromises students' English language skills. Moreover, they suggest that immersion students are in no way impeded in their learning of subject material taught in the L2. We further investigate these results by moving beyond issues of linguistic and academic competence to discuss in greater detail the underlying cognitive benefits of bilingualism. This section of the article reviews research into bilingual students' mental flexibility, creative thinking, and communicative sensitivity; explores their advantages in the realm of metalinguistic awareness; and touches on a neurolinguistic theory of bilingualism. We conclude with reference to some of the cultural and economic benefits of learning French.

FSL education in Canada

FSL education in Canada is made available through a range of program options. These include core French (CF), French immersion (FI), extended French (EF), and intensive French (IF). While this article focuses primarily on the benefits associated with FI, readers unfamiliar with the various program alternatives may appreciate a brief overview.

Core French is intended to provide children with a basic level of proficiency in French. Instruction in French language skills and culture is usually introduced between kindergarten and Grade 5. Most CF students spend approximately 20 to 40 minutes per day learning

TABLE 1

Early, middle, and late French immersion starting grades and time in French

Program	Starting Grade	% time in French before secondary school
Early French immersion (EFI)	K or 1	50–100% in initial grades; 50% by about Grade 5
Middle French immersion (MFI)	4 or 5	50–80%; 50% by about Grade 7
Late French immersion (LFI)	6, 7, 8	50–80%

French Language Arts. Students of CF constitute about 83% of Canadian students enrolled in FSL programs (MacFarlane, 2005).

French immersion programs move beyond French as an object of instruction to employ the language as the primary medium of instruction (Turnbull, Lapkin, & Hart, 1998). Immersion programs vary mainly in terms of starting grade and percentage of instructional time in French. Table 1, adapted from Lapkin, Swain, and Shapson (1990, p. 659), illustrates this variability. By the end of Grade 8, students will have accumulated approximately 6,000 (EFI), 2,000 (MFI), or 1,200 (LFI) total hours of French instruction (Turnbull et al., 1998).

Extended French programs (available only in Ontario, Newfoundland and Labrador, and Nova Scotia) provide CF students with additional exposure to French by using French as the language of instruction for one or two core subjects in addition to French Language Arts. This option may be available to students from Grade 4 through secondary school.

Intensive French is a relatively new program, first piloted in Newfoundland and Labrador between 1998 and 2001 and more recently initiated in six additional provinces and in the Northwest Territories (MacFarlane, 2005). This program augments the CF program with an intensive period of French instruction covering one-half of a school year, generally in Grade 5 or 6. During this period, students spend approximately 70% of the school day learning FSL. IF teaching strategies focus primarily on students' language use (Netten & Germain, 2004).

Proficiency in French

Since the 1960s, the impact of FI programs on students' L2 proficiency has been a major focus for research into FSL education in Canada. While the literature is not without debate, research has consistently shown that immersion programs are successful in helping

students to achieve high levels of proficiency in French by the end of high school.

In a study conducted in Alberta in 2003 and 2004, the Public Service Commission of Canada (PSCC, 2005) found that the majority of the 540 graduating Grade 12 FI students who participated in the study obtained a grade of B¹ (intermediate level) or better for reading, writing, and oral interaction skills assessed in French. The majority of students (76.6%) who completed the reading, writing, and oral interaction tests in spring 2004 obtained a BBB profile (i.e., B for each of reading, writing, and oral interaction) – a common requirement for bilingual positions in the federal public service. A further 20% obtained a CCC profile. This study demonstrates that FI graduates can attain a high level of French proficiency and meet PSCC employability standards.

Children enrolled in FI programs in the past generally came from a majority language group whose first language, English, was reinforced in interactions beyond the classroom. There was some concern that immigrant children from a minority language group might not be as successful as anglophone children. However, the sample tested in the Alberta study included many immigrant students whose results were comparable to those of their peers from anglophone backgrounds. These results are reinforced by a research study (Swain, Lapkin, Rowen, & Hart, 1990) that compared the achievement of 200 immigrant Grade 8 students who had begun immersion in Grade 5 with language backgrounds other than English to that of mainstream anglophone students in French writing, reading, speaking, and listening. Results of this study showed that the immigrant students performed as well as or better than the anglophones. The subset who performed better than anglophones had developed literacy skills in their L1.

The gap between receptive and productive skills

While graduates of immersion programs are generally effective communicators with high levels of proficiency in their L2, they rarely attain native-like proficiency in all areas. Genesee (1987) found that students in early immersion programs develop native-like receptive language skills in French at about 11 years of age, but he observed linguistic errors in EFI students' phonology, vocabulary, and grammar. These findings are consistent with those of Cummins (2001), who asserts that EFI students typically approach native-like levels in French listening comprehension and reading skills by the end

of elementary school but are nonetheless easy to distinguish from comparable native speakers in their speaking and writing skills. Swain (1996) identifies speaking as the weakest skill area for immersion students, with weaknesses most commonly in the areas of grammatical and lexical competence rather than discourse skills.

Although most researchers examining the French language skills of immersion graduates agree that graduates approach native-like levels of performance in the receptive skills of listening and reading comprehension, Lapkin, Swain, and Shapson (1990) state that these findings represent a generalization made without comparing immersion graduates to francophone peers, because of the difficulty of finding comparison groups with similar characteristics. Two studies where such comparisons were possible (Genesee, 1987; Wesche, Morrison, Ready, & Pawley, 1990) indicate similar levels of performance on listening and reading comprehension for immersion and francophone students, but Genesee (1987, p. 46) points out that the tests used doubtless involved 'school-type' language. According to Lightbown,

the so-called 'nativelike' levels of performance on tests of receptive skills may be misleading since much sophisticated psycholinguistic research suggests that such nativelike levels of performance are quite rare even in very skilled bilinguals (I'm thinking of such things as the reading research by Norm Segalowitz and his colleagues, word association and mental lexicon research by – and reviewed by – Paul Meara, work by Wally Lambert et al. too). I think lots of us are increasingly uncomfortable with general statements about comprehension skills and look forward to more sophisticated studies which will probe the limits of immersion students' comprehension abilities so that, eventually, gaps in these abilities can be taken into account in teacher training and curriculum planning. (as cited in Lapkin, Swain, & Shapson, 1990, p. 644)

Some of these difficulties have been explained by immersion students' learning context, which does not provide sufficient opportunities for the interaction in French, particularly with francophone peers, that may be necessary to develop native-like abilities (Cummins, 2001).

Harley (1998) suggests that immersion students become highly skilled in the use of receptive and productive communication strategies to compensate for their gaps in knowledge of French and are not pushed to be more precise in their use of the L2.

Benefits of intensive instruction

Although one would expect studies comparing the French proficiency results of students from different immersion program types (i.e., early, middle, or late; total or partial) to show that students in EFI programs demonstrate French language skills superior to those of students in programs with fewer accumulated hours, comparative research on early and late immersion students has generated somewhat more equivocal findings. Differences between EFI and LFI students' L2 skills are rarely as great as the difference between their total hours in French instruction might lead one to expect (Swain, 1996; Turnbull et al., 1998). Intensity of instruction also seems to play a significant role.

Turnbull et al.'s (1998) research on instructional time in French and L2 proficiency found that graduates of EFI programs outperformed those from MFI and LFI programs on selected measures of listening and speaking ability but not on a multiple-choice test of listening comprehension, nor on any measures of literacy in French. The authors conclude that the benefits of early entrance into a total immersion program manifest most strongly in graduates' improved speaking skills.

Genesee's (1987) study of EFI and LFI students in Montreal found marked differences between the two groups' French proficiency at the end of Grade 7 or 8, when the LFI students had completed only one immersion year. However, testing at the high school level revealed that the LFI group had largely caught up with their EFI peers, even though the former had received only 1,400 hours of French instruction and the latter 5,000 at the time of evaluation. These findings are echoed in the results of research by Lapkin, Swain, Kamin, and Hanna (1983), which show that Grade 8 LFI students in Ontario's Peel Region performed better than a comparable Grade 8 EFI group in Ottawa, despite having received only half as many accumulated hours of French instruction. Lapkin et al. conclude that 'the percentage of time spent in French (intensity) at a given grade level is more important than the total accumulated hours of French instruction in developing L2 skills' (p. 199). Genesee also affirms the importance of intensive instruction in French, noting that while L2 learners do profit from an early entrance into immersion, the 'intensity of second language exposure may be as important as cumulative exposure' (p. 191). Both Genesee (1987) and Swain (1996) also associate the impressive gains made by LFI students in response to short-term, intensive French instruction in Grade 7 or 8 with a heightened efficiency on the part of older L2 learners.

However, a study by Reeder, Buntain, and Takakuwa (1999), exploring the academic consequences of intensifying the use of French as a medium of instruction from Grades 4 through 7 of an EFI program, produced the opposite results. One group received 80% of their instruction (including mathematics) in French, the other 50%. Results showed that students in the 80% group were stronger in French descriptive writing but that achievement in French reading and French descriptive writing, while still exceeding grade-level norms, did not differ between groups. Reeder et al. conclude that after a certain threshold, increasing the time spent in the L2 does not increase French proficiency, although perhaps a change in curriculum might.

Harley (1998) hypothesizes that EFI students learn French through a lexical, memory-oriented approach in keeping with first and second language acquisition in natural settings, while LFI students use an analytical approach. The results of a study by Harley and Hart (1998) provide support for this hypothesis, showing memory for text as the main predictor of scores on French proficiency tests for EFI students and analytical language ability as the main predictor of scores for LFI students. Harley asks whether these results are determined by the starting age of the learners or whether they reflect different teaching emphases in early and late immersion that encourage different learning orientations and whether a more balanced approach in both programs would result in less fossilization.

Proficiency at the high school level

Research suggests that while FSL programs available to immersion students at a high school level do help to maintain students' proficiency, they are insufficiently intensive to further enhance the French language skills of students coming from immersion programs.

Lapkin et al. (1983) report that 'progress is made from Grade 8 to Grade 10 and then tapers off when intensive exposure to French ends' (p. 201) suggesting that the secondary school program following LFI is designed to maintain rather than to enhance L2 performance.

The positive effects of continued intensive exposure to French instruction during secondary school are explored in Turnbull et al.'s (1998) study of Grade 12 immersion students. This research compares LFI and MFI students whose accumulated hours of French instruction

at graduation are equal but who differ in the number of French courses completed during high school. The authors found that LFI students who completed 12 or more French classes at the high school level achieved better scores on a range of proficiency tests than did MFI students who had more years of French instruction but completed eight or fewer French courses in high school.

However, a comparison of EFI and MFI programs in the Toronto area (Lapkin, Hart, & Swain, 1991) suggests that although the strongest MFI class performed at levels similar to EFI on several French measures (at Grade 8), performance across classes within MFI spanned a much broader range, or was less consistent, than results from EFI. It would seem that students who choose MFI are a much less homogeneous group than either EFI or LFI. More research on intensity versus accumulated hours is needed at the high school level to verify results.

Although intensity of instruction clearly has a positive effect on language proficiency, more research is needed to discover the optimal level of intensity and the conditions required for its continued effectiveness.

Conceptualization of intensive French

Empirical studies such as those cited above have contributed to the recent conceptualization and development of the intensive French (IF) program for Canadian students (Netten & Germain, 2004) to enhance existing core French programs and improve their results. As established in our overview of FSL options in Canada, IF augments the CF program by devoting five months (half of the school year), generally in Grade 5 or 6, to intensive French instruction using group work and other approaches that foster interaction. Grammar is taught where and when needed. The normal Grade 5 or 6 curriculum in English and regular core French are taught in the remaining five months. Research on the Newfoundland and Labrador pilot project has shown that students in IF demonstrate impressive progress in French oral proficiency. By the end of the Grade 6 program, the students surveyed achieved results on oral proficiency tests consistent with those of Grade 9, 10, and even 11 students in regular CF programs (MacFarlane, 2005). In oral interviews, IF students were able to speak with some spontaneity about topics of interest to them (Netten & Germain, 2004). Students' writing skills were such that they could compose a narrative comparable in its accuracy to one written by Grade 3 Quebec francophones and in its fluency to a

composition by Quebec francophones in Grade 4. IF students were able to write or reply to a letter from a friend, write messages to students at their age level, and ask and answer questions in French.

Proficiency in English and academic achievement

Primary among the concerns raised by parents and educators about FI programs are the effects of L2 instruction on children's development of L1 skills and on their general academic achievement. In the past, researchers responding to these concerns pointed out that the sociocultural context of FSL education in Canada conformed to conditions commonly identified as conducive to additive bilingualism (Baker, 2006; Genesee, 1987). Children enrolled in EFI programs generally came from a majority language group, so that their L1 was reinforced in interactions beyond the classroom. Students therefore added an L2 to their linguistic repertoire by choice, without thereby rejecting or compromising proficiency in their L1 (Genesee). Indeed, the studies cited below suggest that FSL students were expected to develop, by graduation, English language skills on par with or exceeding those of regular English-program students. Moreover, they suggest that immersion students were in no way impeded in learning subject material taught in the L2.

Swain and Lapkin (2005) indicate that over the past decade the assumption that immersion students are mainly anglophones has become less accurate. Their review of three key studies of immigrant children enrolled in immersion indicates that, in each case, trilingualism was seen as a resource and not a handicap, since immigrant children performed as well as or better than their anglophone peers.

English proficiency results

Because most EFI students receive no instruction in English Language Arts before Grade 3 or 4, EFI students tested during their first three years of schooling demonstrate less advanced English language skills than do their peers in regular English programs. Swain's (1974) study of EFI students in Grade 2 shows that the students' English reading and spelling skills were compromised in comparison to children who had received instruction in English. However, once formal English studies are introduced to the EFI curriculum in Grade 3 or 4, EFI students make rapid progress in their English reading and writing skills. Although early immersion programs devote just 20% of instructional time to English Language Arts from Grade 4 through

Grade 8, by the end of elementary school EFI students typically develop English skills that match or surpass those of their peers in the regular English program.

Similarly, Turnbull, Hart, and Lapkin (2001) note a lag in Grade 3 EFI students' English literacy performance on Ontario provincial tests, but the literacy-test results they report for EFI students in Grade 6 are significantly higher than those of comparable students in English-language programs. This last finding is echoed in a Statistics Canada (2004) study of older students' English proficiency, which found that 15-year-olds enrolled in immersion programs performed at a higher level in English reading than comparable non-immersion students did.

Swain (1974) explains the quick development of English reading and writing skills observed among EFI students in Grades 3 and 4 by suggesting that students may find it easier to learn to read in French than in English because of the former's more systematic sound-symbol correspondence. EFI students already have a grounding in English sound patterns, vocabulary, and language structures, so once students have acquired basic reading skills, it is not difficult for them to transfer these skills to their L1.

This explanation is in keeping with Cummins' linguistic interdependence hypothesis (Cummins & Swain, 1986). Cummins (2000) argues that L1 and L2 academic skills are 'manifestations of a common underlying proficiency,' meaning that literacy-related skills can be transferred from one language to the other. French language instruction can therefore be understood as developing not only French language skills but also a 'deeper conceptual and linguistic proficiency that contributes significantly to the development of literacy in the majority language.' Cummins, like Swain (1974), suggests that students are most likely to transfer literacy skills from a minority to a majority language, given their exposure beyond the classroom to majority-language literacy and the greater social pressure to learn to read and write in the majority language.

Baker (2006), citing studies in which EFI students demonstrated English language skills more advanced than those of students in regular English programs, attributes this enhanced proficiency in part to the specific cognitive advantages that bilingual children tend to enjoy. These include increased linguistic awareness, greater flexibility in thought, and more internal examination of language. We return to this idea in this article's third section.

Swain (1974, 1996) notes that partial immersion programs were initiated in part as a response to parents' concerns about the impacts of L2 learning on students' L1 development. Her research shows,

however, that programs in which instruction is divided evenly between English and French produce students whose L1 skills surpass neither those of students in a regular English program nor those of students in a total French immersion program who have been introduced to instruction in English Language Arts during Grade 2 or 3. While early partial immersion students tend to catch up with English-program peers by the end of their elementary schooling, they do not share EFI students' tendency to surpass non-immersion comparison groups in first language proficiency (Baker, 2006).

Intensity also plays a role in English proficiency results. A study by Reeder and Bournot-Trites (2002) examining the progress of two cohorts of Vancouver-area FI students from Grade 4 through Grade 7 found that both groups performed above national norms in English reading; however, contrary to theoretical expectations, the intensified group (which received 80% of core academic instruction in French) was comparatively weaker than the group given 50% of core academic instruction in French. They conclude that the additional 225 to 250 hours of French language experience per year was simply insufficient to trigger the gains anticipated for L1 literacy outcomes. This may suggest that some core features of immersion education will need to be revised in order to maintain the goal of additive bilingualism for immigrant children enrolled in immersion programs (Swain & Lapkin, 2005).

Academic performance in core subjects

Research into immersion students' content learning suggests that students who are taught subject material in French generally perform as well as or better than their peers in regular English programs on English-language mathematics, science, and history tests. Swain (1974) found that EFI students' scores on tests of computational and problem-solving arithmetic either matched or exceeded those of regular English program students.

These findings are corroborated by Turnbull et al.'s (2001) research into immersion students' performance on Ontario English-language provincial mathematics tests. Test results for Grade 3 students showed no relationship to accumulated hours of instruction in English, while Grade 6 EFI students' scores were distinctly better than those of their peers in English-language programs.

Bournot-Trites and Reeder's (2001) study contributes to a body of research suggesting that early partial immersion students' academic achievement may lag behind that of early total immersion students.

Baker (2006) suggests that early partial immersion students' achievement in mathematics and science can be compromised when these subjects are taught in the L2. Swain (1978, as cited in Swain, 1996) has shown that Grade 6 partial immersion students do not perform as well as either regular English program students or EFI students in either science or mathematics. Swain (1996) explains these results by noting that early partial immersion students may not possess sufficient proficiency in their L2 to respond effectively to French-language instruction in core subject areas.

Bournot-Trites and Reeder (2001) initiated their study on the effects of teaching mathematics in French on mathematics achievement evaluated in English with the intent to address parents' concerns over their children's ability to learn mathematics in a second language. The study, which followed two cohorts of Vancouver-area French immersion students from Grades 4 to 7, effectively lays these concerns to rest. One of the cohorts studied received 20% of their core academic instruction in English and 80% in French, including mathematics. The other received 50% of their instruction in English, including mathematics, and 50% in French. When both groups' achievement in mathematics was measured at the end of Grade 6, the former group scored higher on an English-language standardized mathematics test. The authors conclude that increasing the intensity of French instruction in a French immersion program has a positive effect on mathematics achievement evaluated in English. They note that their study lends support to Cummins' (1979) threshold hypothesis and interdependence hypothesis: the results show evidence of transfer, in that students were able to retrieve mathematical content learned in their L2 and apply this knowledge on an English-language test. As Bournot-Trites and Reeder note, Cummins' threshold hypothesis (Cummins & Swain, 1986) associates high levels of proficiency in both a first and an additional language with significant linguistic, cognitive, and academic advantages. It is to these cognitive benefits that we now turn.

Cognitive benefits of bilingualism²

Mental flexibility and divergent, creative thinking

The advent of contemporary thinking on bilingualism and cognition is generally associated with Peal and Lambert's (1962) comparative study of intelligence in bilingual and monolingual children in Montreal. Peal and Lambert repudiated the then widely held

assumption that bilingualism has negative or, at best, neutral cognitive effects by using an innovative methodological approach to demonstrate that bilingualism leads to significant cognitive advantages (Baker, 2006). The study sample consisted of 110 balanced-bilingual and monolingual 10-year-old children, all drawn from the same school system and matched on the basis of socio-economic status. Peal and Lambert observed that balanced bilinguals – students equally fluent in both languages – outperformed monolinguals on 15 of 18 variables measuring IQ. Bilinguals' performance was particularly strong on tests requiring mental manipulation, reorganization of visual patterns, concept formation, and symbolic flexibility. These findings led the authors to conclude that bilingual children demonstrate more mental flexibility, an ability to think more independently of words, superiority in concept formation, and a more diversified intelligence than monolingual children do. Baker locates in Peal and Lambert's work the origins both of a contemporary emphasis on bilingualism's 'additive effects' and of the current use of broader, more pluralistic concepts of intelligence and cognition in research on bilingualism and cognition.

Among the alternative measures of cognitive ability employed by researchers since Peal and Lambert's (1962) study are tests of divergent, or creative, thinking. Divergent thinking tests give students a starting point for thought and ask them to generate a wide variety of alternative solutions. Baker (2006) offers the question 'How many uses can you think of for a brick?' as an example. Research into bilingualism and divergent thinking suggests that bilinguals are more fluent (able to provide a greater number of acceptable answers), more flexible, more original, and more elaborate in their answers to open-ended questions than are comparable monolinguals (Baker, 2000). Baker (2000) identifies a heightened 'elasticity in thinking' among bilinguals, which he associates with having access to two or more words for an object or idea. Each of these words will carry different associations, thereby broadening the scope for free association.

Cummins (1975, 1977) has further refined this research, by identifying a difference in divergent thinking between non-balanced bilinguals, on the one hand, and balanced bilinguals, on the other. Balanced bilinguals outperformed 'matched' non-balanced bilinguals on scales of fluency and flexibility in divergent thinking and, to a lesser extent, on originality. This evidence led Cummins to develop his threshold hypothesis, which states that bilingual children must achieve a certain level of linguistic competence if they are to avoid

cognitive deficits and enjoy bilingualism's beneficial influence on cognitive growth.

Metalinguistic awareness

While the research into flexibility and divergent thinking has sought to identify a particular cognitive style or dimension of thinking in which bilinguals outperform monolinguals, more contemporary research has tended to focus on the process of thinking rather than on its product (Baker, 2006). For instance, Bialystok (2001) associates the flexibility and creative thinking observed in bilingual children with their enhanced metalinguistic awareness. Metalinguistic awareness can be understood as an ability to direct attention to, and reflect on, the systematic features of language. Research into metalinguistic awareness in bilingual and monolingual children typically employs tasks that assess either word awareness or syntactic awareness (Bialystok, 2001). Research on word awareness has consistently shown that bilingual children possess a more sophisticated understanding of the relation between words and their meaning than monolingual children do. Bilinguals demonstrate a finer grasp of the arbitrariness of names, a greater willingness to accept that 'the meaning of a word is more convention than necessity' (Bialystok, 2001, p. 136). Bilingual participants in Ben-Zeev's (1977) research thus performed more reliably than comparable monolinguals when asked to amend a set of sentences by replacing the word 'we' with the word 'spaghetti.' Their greater tolerance for the nonsensical phrases that resulted suggests that bilingual children are less bound by the meaning of words. Bialystok (2001) notes that this advantage also extends to a heightened capacity to accept the arbitrariness of numbers and their functional role in counting. Baker (2006) suggests that bilinguals' more analytical orientation to language may facilitate the earlier acquisition of literacy skills.

Baker's (2006) review of research into metalinguistic awareness in bilingual children leads him to conclude, however, that bilinguals do not possess a universal metalinguistic superiority over monolinguals. Rather, he notes, bilinguals enjoy heightened metalinguistic abilities in particular areas and are especially proficient in performing tasks that require selective attention to information – for example, in situations that present a subject with misleading or competing information. Selective attention relates both to bilinguals' heightened capacity to explicitly represent and analyze linguistic knowledge and

to their greater attentional control in internal language processing (Baker, 2006; Bialystok, 2001).

Bialystok (2001) has found that bilingual children also apply their selective attention skills to non-verbal problem-solving tasks. Their advantage is most readily observed in tasks that have higher demands of control, for instance, when the knowledge required to find a solution is embedded in a misleading context. In Bialystok and Codd's 'towers task' (1997, as cited in Bialystok, 2001), children were asked to examine two towers – one made of large Duplo blocks, the other of smaller Lego blocks – and then to determine which tower had more blocks. Bilinguals were better able to ignore the misleading information presented by the towers' relative heights and identify the shorter Lego tower as having more blocks. Bialystok (2001) attributes the flexibility and creativity observed in bilinguals by researchers such as Peal and Lambert (1962) and Cummins (1975, 1977) to these same selective attention skills. Like the towers task, tests of divergent thinking require children to control their linguistic processing by inhibiting the 'salient and automatically associated function' (p. 212) in order to generate alternatives.

Communicative sensitivity

Research into bilingual children's sociolinguistic competence suggests that bilinguals exhibit heightened sensitivity to verbal and non-verbal cues, and show greater attention to their listeners' needs, than monolingual children do. Ben-Zeev (1977) has observed that Hebrew-English bilingual children more readily pick up listeners' hints and cues, and correct errors in response to feedback more quickly, than their monolingual peers. Genesee, Tucker, and Lambert (1975) provide further evidence of heightened communicative sensitivity in their study of interpersonal communication skills among EFL and regular English program students. The authors asked students, aged five to eight, to explain a board game to a second child wearing a blindfold. The children in the immersion group responded to the listening child's handicap by describing the materials with which the game was played before explaining the rules; monolingual children provided far less information. Genesee et al. conclude that the bilingually educated children 'may have been better able . . . to take the role of others experiencing communicational difficulties, to perceive their needs, and consequently to respond appropriately to these needs' (p. 1013). Bilinguals may develop their communicative

sensitivity through monitoring the clues and cues that indicate which language is appropriate to a given situation and through learning to avoid linguistic interference (Baker, 2006).

Threshold theory and cognitive benefits

Cummins' threshold theory suggests that the positive cognitive effects associated with bilingualism are contingent on a learner's linguistic competence in both languages (Cummins & Swain, 1986). There are two thresholds at work in this theory, each representing a level of competence that has cognitive consequences for a child. A child who functions below the first level will demonstrate a relatively low level of competence in both L1 and L2 and may, as a result, experience negative cognitive effects. A child reaches the first threshold by developing age-appropriate competence in one of his or her languages, but not both. At this level, he or she can avoid any negative consequences associated with bilingualism but is unlikely to experience any cognitive advantage over a monolingual child. Only when a child reaches the second threshold level – 'balanced' bilingualism, or age-appropriate competence in two or more languages – can he or she expect to experience the positive effects of bilingualism, as discussed above.

Threshold levels cannot be defined in absolute terms but vary according to a child's stage of cognitive development, the academic demands enacted at a given stage of schooling, the amount of time spent learning in the L2, and the type of cognitive operations that must be expressed in the L2 (Cummins, 2001). The threshold will be higher in total immersion programs, where more instruction is provided in the L2, thereby increasing cognitive demands. In other words, the more time is spent through the L2, the higher the level of L2 competence necessary to avoid cognitive deficits (p. 41).

In this context, the EFI program presents a means of enabling young students to develop French language proficiency at a level sufficient to meet increased cognitive demands in later years. L2 reading-comprehension skills, for example, need to be well established if students are to benefit from French-language instruction in core subject areas after the early grades. As suggested in our review of work by Swain (1996) and Bournot-Trites and Reeder (2001), the threshold theory has important implications for partial immersion programs, whose students are typically less quick to develop French language skills and may therefore be less effective at processing core subject-area instruction in French.

A neurolinguistic theory of bilingualism

Paradis (2004) introduces his integrated neurolinguistic perspective on bilingualism by asserting that bilinguals understand each language directly, just as monolinguals do. Rather than translating to themselves in their L1 what they have heard or said in their L2, bilinguals organize their mental representations in accordance with either the patterns of the first language or those of the second, depending on which is appropriate. Bilinguals thus have the ability to adopt two perspectives, an advantage that enhances general mental capacity and supports alternative ways of considering the same information.

However, as suggested by Cummins' threshold theory, substantial differences exist in the cognitive functioning of bilinguals operating at different levels of linguistic competence. Weinreich (1953, as cited in Paradis, 2004) differentiates between subordinate bilinguals, compound bilinguals, and coordinate bilinguals, each of whom follows different patterns of cognitive functioning. Subordinate bilinguals use meanings from their L1 for words in their L2, so that where the lexical meaning of the L1 word differs from that of the L2 translation, misunderstandings will occur. Compound bilinguals function cognitively in a manner that is appropriate to neither their first nor their second language and, as a result, are vulnerable to misunderstanding and to being misunderstood. Coordinate bilinguals apply the appropriate concepts in each language and thus understand and are readily understood by speakers of both languages. Paradis notes, however, that bilinguals who approximate native competence in each language may nonetheless experience difficulty translating what they have just heard or said. This is because some concepts are more easily accessed in one language than in the other. Where one language does not contain a word that activates a specific concept, a bilingual speaking with other bilinguals will tend to avoid the need for awkward phrasing by referring to that concept with a label from the other language.

Paradis (2004) explains this last phenomenon with his three-store hypothesis, which suggests that bilingual speakers possess two language subsystems, both of which interact, 'in every act of comprehension or expression' (p. 196), with a single non-linguistic cognitive system. Each language subsystem contains a grammar and a set of lexical meanings for words in its respective language. The conceptual system is 'ontogenetically prior' to the lexical system: it builds concepts – mental representation of objects, qualities, or events – through experience. However, interaction between the

conceptual system and the lexical system implies that, with the acquisition of language, a learner will begin to reshape existing concepts and construct additional ones. This results in the addition of linguistically and culturally defined concepts and classification procedures that may exist beside concepts that are experientially derived. Importantly, lexical semantics and concepts remain neuro-functionally separate, the former being part of the language subsystem and the latter belonging to the cognitive system. Because each language subsystem remains separate, concepts evoked by a word in one language will differ from those evoked by its translation equivalent where lexical semantic organization differs between the two languages (p. 199).

Communication, cultural, and economic opportunities

In the final section of this article, we turn our attention to the sociocultural and economic opportunities associated with learning French as a second language. Learning French enables students to communicate with a wide variety of people, both in Canada and internationally; it fosters respect for different cultures and facilitates access to two worlds of experience. Students who become bilingual enjoy access, on graduation, to a far wider range of national and international jobs than is available to monolingual graduates, including positions with airlines, import-export companies, and other international businesses in addition to domestic opportunities. Among the most significant bilingual employers in Canada is the Public Service Commission of Canada, 39.2% of whose 165,679 positions are bilingual.

Parkin and Turcotte (2004) identify perceived economic benefits as one of the primary factors motivating Canadians to learn a second language. Their research shows that 88% of Canadians believe that people who speak more than one language are better equipped to succeed in today's global economy. However, they also note that 82% of Canadians agree that learning an L2 is one of the more fulfilling things a person can do. The authors point to this last figure as proof that Canadians' interest in L2 learning is not based on economic considerations alone. Further evidence for this claim can be found in survey participants' appreciation for Canada's linguistic duality: two-thirds of respondents placed the presence of the two official languages among those elements that define what it means to be Canadian, while two-thirds of the surveyed anglophones outside

Quebec believed that learning to speak French could help keep the country united.

Summary and recommendations

Our survey of research on FSL education in Canada suggests that French immersion programs enable students to develop high levels of proficiency in both French and English, at no cost to their overall academic success. EFI students typically develop 'native-like' receptive school-based language skills in French by about 11 years of age and achieve high levels of proficiency in speaking and writing by graduation. While children benefit from an early introduction to immersion, the rapid progress made by students who begin immersion programs between Grade 6 and Grade 8 has led researchers to value shorter-term, more intensive French language instruction as well. Research into the positive effects of intensive language instruction has led to the conceptualization of intensive French, designed to improve core French programs. Further research may be needed to identify the specific factors that make intensified instruction successful for different contexts.

Students in EFI programs demonstrate similar progress in catching up with non-immersion students' English language skills following the introduction of English Language Arts to the early immersion curriculum in Grade 3 or 4. By Grade 6, EFI students' English proficiency matches or exceeds that of their non-immersion peers. This aptitude in English may reflect an underlying linguistic interdependence, evident also in EFI students' ability to apply content learned in French to English-language tests. The increasing proportion of immigrant children in immersion classes suggests that maintaining this goal of additive bilingualism may require revisions to immersion programming.

Research suggesting enhanced academic achievement among immersion students has prompted some researchers to seek an explanation in the literature on the cognitive benefits of bilingualism. The cognitive research reviewed here associates bilingualism with heightened mental flexibility and creative thinking skills, which may be linked to bilingual learners' greater metalinguistic awareness. Bilinguals also demonstrate greater communicative sensitivity, as indicated by their responsiveness to verbal and non-verbal cues and by their ability to attend to listeners' needs. Because cognitive benefits are contingent on a bilingual learner's proficiency in both languages, it may be that immersion programs, which promote heightened

proficiency in both French and English, foster in their students an underlying cognitive advantage. Additional research may be needed to pinpoint the threshold levels of proficiency required to activate these benefits in a classroom context. This advantage notwithstanding, immersion programs facilitate access to a range of communicative, cultural, and economic opportunities unique to bilingual speakers in Canada.

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Notes

1. Results of Public Service Commission Language Tests are classified as level A, B, C, or E (A = lowest; E = exempted from further testing). The same levels are used to define language qualifications for federal government jobs. A BBB profile would indicate a candidate who had achieved the B level on the reading, writing, and oral interaction tests (PSCC, 2007).

At the B (intermediate) level a student can

- engage in an informal conversation on concrete topics
- speak with some spontaneity
- talk about facts and events in time (i.e., has good mastery of simple verb tenses)
- write short descriptive or factual texts with sufficient mastery of grammar and vocabulary
- be understood by most people, although repetition may sometimes be required

At the C (advanced) level, a student can

- understand most descriptive or factual material on a range of subjects
- grasp main ideas and specific details
- participate in discussions on a variety of topics

- demonstrate a natural delivery
 - be easily understood (pronunciation does not interfere with communication)
 - write explanations or descriptions in a variety of informal and formal personal and work-related situations
 - write texts in which ideas are developed and presented in a coherent manner
2. Research studies of the cognitive benefits of bilingualism were not generally conducted in FSL learning contexts. It cannot be assumed that cognitive benefits resulting from bilingualism are intrinsically evident in FSL contexts.

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