SUCCESS IN EARLY AND LATE FRENCH IMMERSION: A STUDY ON LANGUAGE APTITUDE AND MOTIVATION

by

Katrina Kwan

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Abstract

French immersion programs have continued to increase in popularity in British Columbia over the past ten years. The expected French language outcomes are the same for both Early French immersion (EFI) and Late French immersion (LFI) programs, yet it is commonly believed that an early start to language learning will lead to a greater level of second language proficiency. Research in the context of French immersion programs has not always supported this view. A variety of factors have the potential to influence second language learning and outcomes; however, foreign language aptitude and motivation have been found to be the most consistent predictors of second language success. This study investigated the relationship between the components of language aptitude and motivation, and second language outcomes of grade 11 students from EFI versus LFI programs in Western Canada. Results showed that overall the two groups had similar levels of language aptitude; however, the LFI students demonstrated stronger language analysis abilities. Similarly, the groups did not differ in their attitudes toward or motivation for learning French. Language aptitude was shown to be related to French vocabulary knowledge and listening comprehension skills for both EFI and LFI students, while motivation was associated with pronunciation (i.e., French accent) more for LFI than EFI students. Findings suggest that language aptitude relates to French language outcomes regardless of age of onset and is perhaps a better predictor of foreign language outcomes than age or amount of time spent learning a language.
Preface

This thesis is an original intellectual product of the author, K. Kwan, and was written in consultation with Dr. S. Marinova-Todd. Data were collected in conjunction with a student colleague A. Rustom and were also used in her thesis. The fieldwork reported in Chapters 2 – 4 was covered by UBC Ethics Certificate # H14-03048.
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To my Faja
1. Introduction

Compared to a decade ago, enrolment in French immersion (FI) programs in British Columbia’s public schools has increased by 47.54% (Canadian Parents for French, 2015a). Enrolment in French immersion has consistently grown, from 35,636 students enrolled in the 2004-2005 academic year increasing to 49,450 in 2013/2014; meanwhile, overall school enrolment has steadily declined from a total enrolment of 606,383 students in BC public schools in the 2004/2005 academic year down to 558,985 in 2013-2014 (Canadian Parents for French, 2015b; BC Ministry of Education, 2015). In the 2014-2015 academic year, 50,308 students from kindergarten to grade 12 were enrolled in FI programs in public schools across B.C. (BC Ministry of Education, 2015). Surprisingly, the average attrition rate in grades seven through 12 between 2004 and 2014 was 42.35%, with the highest proportion of dropout occurring in the transition from grade seven to eight at an average rate of 14.17% (Canadian Parents for French, 2015a). This leads one to wonder what the necessary factors might be that lead to a successful completion of the French immersion program.

1.1 French Immersion in British Columbia

In BC, in addition to the regular English mainstream schools, parents can choose to enroll their children in an early FI program (starting in Kindergarten or Grade 1) or a late FI program (starting in Grade 6). The early FI (EFI) program is structured such that students receive 100% instruction in French from kindergarten to grade three, followed by 80% in grade four to seven, 50-75% in grade eight to ten, and no less than 25% in grade 11 and 12 (BC Ministry of Education, 2014). The BC Ministry of Education recommends that the late FI (LFI) program begin with 100% instruction in French for the first year and that courses
taught in English constitute no more than 20% of instructional time in the second year. Once students in the LFI program reach high school (grade eight), they follow the same program structure as those in the EFI program. The goals for students in both the EFI and LFI programs are the same, namely: “…students] should be able to participate easily in conversations in French, take post-secondary courses with French as the language of instruction and accept employment with French as the language of the work place” (BC Ministry of Education, 2014). If the outcome is meant to be the same in both cases, then it is important to establish any possible advantages of enrolling in one program over the other.

It is commonly believed that children will have a higher chance of success and attain a greater level of proficiency in their second language (L2) if they begin learning the language at a young age. The Critical Period Hypothesis (CPH) purports that language acquisition has a biological basis that results in eventual native-like L2 proficiency in pre-pubescent learners (Lenneberg, 1967). Due to the decrease in brain plasticity that occurs with maturation, the CPH predicts that post-puberty learners will not achieve native-like proficiency in their L2 (Long, 2013; Abrahamsson & Hyltenstam, 2008; Birdsong & Molis, 2001; Dekeyser, 2000; Johnson & Newport, 1989). However, the CPH has been fiercely debated for several decades. Critics of the CPH argue that it is possible for second language learners to achieve native-like proficiency in their second language regardless of the age at which they began learning the language (Marinova-Todd, Marshall, & Snow, 2000, 2001; Hakuta, Bialystok, & Wiley, 2003). In recent years, researchers have softened their stance regarding the CPH; instead, a sensitive period for second language acquisition seems to be the more accepted notion (Long, 2013; DeKeyser, 2013; Granena & Long, 2012; Hakuta, Bialystok & Wiley, 2003). While a “critical period” implies a sharp decline in the capacity
to learn human language, a sensitive period entails a more gradual decline with a period of peak sensitivity followed by an offset potentially lasting five to six years and then a flattening of the data, and may involve some individual variation (Granena & Long 2012; Birdsong, 2005).

In a recent study supporting the existence of sensitive periods for second language acquisition, Granena and Long (2012) investigated the scope and timing of maturational constraints in three linguistic domains: 1) L2 phonology, 2) lexis and collocation (i.e., compound words, multi-word units, idioms, fixed expressions), and 3) morphosyntax. Participants were 65 Chinese learners of Spanish, grouped into three groups based on age of onset (AO): 3–6, 7–15, 16–29 years. The researchers queried whether a relationship between AO and performance in these linguistic domains is consistent with the existence of multiple sensitive periods. Results revealed a steep decline in pronunciation overall, with the steepest declines being in the 3–6 and 7–15 AO groups, followed by a flattening over the remainder of the AO range. The latest AO at which they found evidence of native-like attainment in phonology was 5 years. The steepest declines in the morphosyntactic and lexical and collocation domains were in the 7–15 AO group, and were also followed by a visibly slowed rate of decline, thus there was evidence for discontinuities in all three domains. The latest AO at which they found evidence of native-like attainment in lexis and collocation, and morphosyntax were 9 years and 12 years, respectively. Their findings provided evidence of multiple sensitive periods for different language domains and confirmed previous findings that the opportunity for native-like attainment in a second language closes first for phonology, then lexis and collocation, and finally for morphosyntax. This well designed and executed study presents compelling evidence that multiple sensitive periods exist in the
process of second language acquisition. Based on these findings, one would expect neither EFI nor LFI students to attain native-like phonology, and EFI students would be expected to have a more native-like grasp of lexis and collocation (i.e., lexical phrases, idioms) and morphosyntax. Thus, early and late French immersion students would be expected to differ in their French language attainment given their differing age of onset.

1.2 Early vs. Late French Immersion

If sensitive periods for second language acquisition exist, one would expect to find that students in theEFI program achieve a higher level of proficiency in French compared to their LFI counterparts given the age of onset (AO) and amount of language exposure of each group. However, some studies of EFI and LFI students have found that both groups successfully develop strong French language skills regardless of when they are tested in grade 7 through grade 12, with early immersion students showing advantages on only some French language skills, such as listening comprehension and speaking abilities such as fluency and communicative competence (Genesee, 1981; Lapkin, Swain, Kamin, & Hanna, 1983; Morrison & Pawley, 1986; Day & Shapson, 1988; Turnbull, Lapkin, Hart & Swain, 1998). In fact, Day and Shapson (1988) noted, “[…] empirical studies have uncovered little evidence of the superiority [of] younger second language learners. They suggest on the contrary that older learners are quicker and more efficient because of their more advanced cognitive skills” (p. 292).

In an early study of the effectiveness of three variations of the French immersion program, Genesee (1981) compared EFI students to two groups of LFI students, as well as an English- and a French-monolingual control group. EFI students had begun the program in kindergarten and were in a 40% follow-up program in grades 7 through 9. The one-year LFI
The group had regular core French exposure (20-30 minutes a day of French as a second language instruction) in kindergarten through grade 6, and then began a French immersion program in grade 7, followed by a 40% follow-up program in grades 8 and 9 that was distinct from the EFI follow-up program. Like the one-year LFI students, the two-year LFI students had French instruction in kindergarten through grade 6, but unlike the one-year group, this group had French immersion in grade 7 and 8, followed by 40% of their course load in French in grade 9. Several areas of French language abilities were assessed including reading, dictation, writing, listening comprehension and speaking. Students were also administered the Test de rendement en français, which assessed various French language arts skills including spelling, parts of speech, word knowledge, logical sequencing, and comprehension of prose. Genesee (1981) found that early immersion and two-year late immersion students attained comparable scores on most tests, and that both of these groups performed similarly to the French controls on several measures. Furthermore, both of these groups performed significantly higher than the one-year late immersion students at the grade seven and eight level, though results from tests administered at the grade 9 level indicated that the one-year late immersion group may have begun catching up. Genesee (1981) remarked that the comparable French language achievement between the EFI students and the two-year LFI students suggests faster learning on the part of the older students given that they had considerably less cumulative exposure to French. He thus noted that, “[…] beginning intensive second language instruction early in school is not necessarily advantageous, other things being equal” (p. 125). Lapkin, Swain, Kamin, and Hanna (1983) subsequently supported Genesee’s (1981) findings when they found that grade 8 LFI students performed better than EFI students, and suggested that the percentage of time in intensive immersion, as
opposed to total hours accrued over time, accounts for the more successful outcomes in the late immersion group.

In a study of EFI and LFI programs in British Columbia, Day and Shapson (1988) compared grade 7 students from three different school districts around the province that were the first in the province in which early and late immersion programs reached grade 7. Across the three districts, the EFI programs offered a similar percentage of instructional time in French in the primary grades (i.e., kindergarten through grade 2, 100%; grade 3, 80%) but differed in the intermediate grades (i.e., District A, 50%; District B, 60%; District C, 70%). The LFI programs provided the same amount of French instructional time across the three districts (i.e. grade 6, 100%; grade 7, 80%). Students were tested on measures of: 1) French language skills (e.g., spelling, vocabulary, grammar, reading comprehension, and logical sequencing); 2) French listening comprehension; 3) attitudes and opinions, and 4) self-perception of French skills. Mean raw scores and standard deviations for the early immersion students were compared statistically to those of the late immersion students in their districts on all measures. Additionally, two-way analysis of variance was conducted on the French language measures to determine main effects of district and program. Findings from the three school districts were not consistent. In terms of French language skills, as measured by the Test de Rendement en Français (Sec. Level 1, 1982-1983), EFI students in only one school district (District C, highest proportion of French instruction in intermediate grades – 70%) performed significantly higher than the LFI students, while EFI and LFI students from the other two districts performed at a similar level. Contrastingly, in all three districts the early immersion students performed significantly higher than their late immersion counterparts in French listening comprehension, as measured by the Test de Comprehension Auditive,
To explain the superior performance of the early immersion students on measures of French listening comprehension across the three school districts, the researchers speculated that listening comprehension might be a skill that develops more slowly than other second language skills. If such were the case, they noted that late immersion students would potentially catch up to their early immersion counterparts in terms of French listening comprehension in future grades. They suggested alternatively that this skill might be closely tied to the amount of instructional time in the second language, which would lead to early immersion students maintaining their advantage. As proposed by the authors, comparing early and late immersion students’ linguistic achievement at the end of secondary school would contribute to our understanding of the source of this discrepancy in French comprehension skills between the two programs.

In terms of attitudes and self-perceptions, Day and Shapson’s (1988) findings again were inconsistent for the three districts. On an adapted version of the Student Opinion Scales (Kaufman, D., Shapson, S., & Day, E., 1982) both early and late immersion students in all three districts had positive student attitude scores, being most positive in their attitudes toward bilingualism and their motivation to learn French. The EFI students tended to be more positive than LFI students in their understanding of French-Canadian culture and their attitudes toward bilingualism, and tended to have higher self-ratings on their ability to speak and understand French. Conversely, LFI students tended to be more willing than EFI students to speak French outside the classroom setting (i.e., at home or outside school). Nonetheless, the results varied across the three districts without a systematic pattern. Given that this study was conducted while French immersion programming was still quite new to British Columbia, it is possible that variety in the program structure and instructional approaches
across the three districts influenced the students’ attitudes and opinions regarding French
immersion, as well as their linguistic outcomes. The authors suggested that further research
would reveal the impact of these perceptions on French language development and noted that
attitudinal and affective variables should be given greater consideration when evaluating the
effectiveness of the two programs. Thus, in the present study an established measure of
attitudinal and affective factors (i.e., Gardner’s AMTB, 1985) was included in the battery of
measures.

As suggested by Day and Shapson (1988), a comparison of EFI and LFI students at
the end of their studies would allow one to determine if students from the LFI program
eventually attain equivalent French language skills to those in the EFI program. One such
study was conducted by Morrison and Pawley (1986), who examined the French language
attainment of EFI and LFI students at the end of grade 12 in Ottawa and Carleton, Ontario.
EFI students had begun French immersion by at least grade 4 and had received an average of
6500-7000 hours cumulative amount of time in French. LFI students began the program in
grade 6 in Ottawa and grade 7 in Carleton, and had received an average of 3000-4000 hours
of time in French. Students were administered a French proficiency test created by the
University of Ottawa as a university-entry French placement exam. The test measured French
listening comprehension and reading comprehension in a multiple-choice format. To pass,
students had to obtain 70% on the test, and a pass mark indicated that the student had a
minimal ability to understand the content of the material but would not have adequate
proficiency to follow courses intended for francophones without further French instruction.
The mean score on all three subtests of the French proficiency test (listening, reading, and
cloze task) was over 80% for both EFI and LFI students. It was found that 93 percent of the
 EFI students and 90 percent of the LFI students obtained scores high enough on the French Proficiency test to be exempt from the required French language course at the university. Results showed no significant differences between the EFI and LFI groups on the French proficiency test. These results contrasted with those obtained by Day and Shapson (1988), who found that early immersion students performed significantly better than late immersion students in listening comprehension. This inconsistency could indicate that the measure used by Morrison and Pawley (1986) was not sensitive enough to distinguish between the groups. Alternatively, these results could confirm Day and Shapson’s (1988) speculations that listening comprehension is a second language skill that develops more slowly and that late FI students would eventually catch up to their early immersion counterparts.

In Morrison and Pawley’s (1986) study, participants also completed a French speaking task created and administered by the Research Centre of the Ottawa Board of Education. This three-part test was designed to measure the fluency and communicative competence of the participants. Unlike results on the French proficiency test, the groups differed significantly in their performance on the French speaking task. More specifically, the EFI group performed significantly better than the LFI students on all French speaking tasks. The finding that early and late immersion students were comparable on French language skills but that early immersion students showed an advantage in French speaking abilities was consistent with research findings by Turnbull et al. (1998), described next.

Turnbull, Lapkin, Hart and Swain (1998) examined the influence of total time spent studying French on Canadian immersion graduates’ French proficiency. In their study, the authors distinguished between early (beginning in kindergarten or grade 1), middle (grade 5) and late (grade 7) immersion programs in Canada. They highlighted that EFI programs result
in approximately 6000 hours of French instruction by the end of grade 8, while students in the middle and late immersion programs receive between 1200 and 2000 hours of French instruction by the same grade level. The researchers conducted testing with a total of 48 classes in school boards within provinces across Canada, including Ontario, PEI, Alberta, Saskatchewan, Nova Scotia, British Columbia, and Newfoundland. The four skill areas tested via the *Senior French Proficiency Test Package for French Immersion* (developed by the University of Ottawa’s Second Language Institute in cooperation with the Modern Language Centre at the Ontario Institute for Studies in Education) were listening, reading, writing and speaking. Most classes were tested at the end of grade 12. In comparing the performance of all three groups on measures of speaking, they found that the early immersion group performed significantly better than students from both the middle and late immersion programs. Turnbull et al. (1998) thus concluded that an early start in French immersion has a clear benefit on speaking skills. Conversely, their analysis of French proficiency comparing the performance of students from the three groups (early, middle, and late immersion) revealed that the early immersion students did not perform significantly better on a multiple-choice test of listening comprehension nor on any measures of French literacy.

In summary, research comparing students from early and late French immersion programs has found that in general the two groups attain comparable French language skills (Genessee, 1981; Day & Shapson, 1988; Morrison & Pawley 1986; Turnbull et al., 1998). Although Day and Shapson (1988) found that in grade 7 the EFI group performed significantly better than the LFI group on French listening comprehension, research comparing these groups at the end of grade 12 showed that EFI and LFI students had comparable performance on tasks of listening comprehension (Morrison & Pawley, 1986;
The disparity in these results may reflect differences in the measurement instruments used; alternatively, this difference could be interpreted as evidence that listening comprehension is a second language skill that develops more slowly but that LFI students eventually catch up to EFI in this domain. In contrast to findings regarding French language skill outcomes, the research reviewed here consistently showed that early immersion students have a significant advantage in the domain of French speaking skills (Morrison & Pawley, 1986; Turnbull et al. 1998). As noted above, if multiple sensitive periods exist in the process of second language acquisition, one would expect neither EFI nor LFI students to attain native-like phonology (see Granena & Long, 2012), while students in the EFI program would be expected to achieve a higher level of proficiency in French language skills (e.g., vocabulary, morphosyntax) compared to their LFI counterparts given the age of onset (AO) and amount of language exposure of each group. Past research in the French immersion context, however, has not provided clear support to the notion of multiple sensitive periods for second language acquisition.

If sensitive periods and amount of time spent learning a second language do not reliably explain learning outcomes in FI settings, other factors must be contributing to student success in French Immersion programs. There are a host of possible individual differences that have the potential to influence second language learning and outcomes. For example, a learner’s level of general intelligence, learning style, learning strategies, learning environment, and previous experience with language could all weigh in on second language achievement. Dörnyei and Skehan (2003) noted, however, that the most consistent predictors of second language success have been generated by individual differences in foreign language aptitude and motivation. Aptitude and motivation do not show high correlations
with each other, but usually show correlations between 0.20 and 0.60 (median value just above 0.40) with language achievement and often yield multiple correlations of above 0.50 when taken together (Dörnyei & Skehan, 2003). No other potential predictor of second language achievement, with the exception of age of onset, has consistently achieved similar levels (Dörnyei & Skehan, 2003). Furthermore, research has shown that language aptitude is a strong predictor of ultimate L2 attainment, accounting for 10%-20% of variance in outcomes (Granena & Long, 2013). Thus, foreign language aptitude and motivation are the two potential contributors to French language achievement in French immersion programs most worthy of attention in the current study.

1.3 Language Aptitude

Language aptitude is thought to be a primarily innate and relatively stable talent for learning languages (Carroll, 1981; Harley & Hart, 1997; Abrahamsson & Hyltenstam, 2008;). Carroll (1981) stated that L2 aptitude is “the individual’s initial state of readiness and capacity for learning a foreign language, and probable facility in doing so” (as cited in Harley & Hart, 1997). From a number of language aptitude studies conducted over a 25-year span, Carroll (1981) gathered that language aptitude is composed of several independent cognitive abilities and is a stable learner characteristic (Carroll, 1981; Harley & Hart, 1997).

More recently, Skehan (2002) proposed that language aptitude is componential and is composed of auditory processing, language analysis, and memory components for language learning. The idea that language aptitude is composed of several subcomponents was supported by recent research conducted by Sparks, Patton, Ganschow and Humbach (2011). Participants were 54 high school students (male = 25, female, 29) that had completed two years of second language study in either Spanish (n = 30), French (n = 14) or German (n =
10), and had been followed from Grade 1 through Grade 10. The researchers conducted a factor analysis of a battery of tests including early first-language (L1) skills, L1 cognitive ability (IQ), second language (L2) aptitude, and L2 affective measures (i.e., L2 Anxiety and L2 motivation), with oral and written L2 proficiency as the outcome measures. Interestingly, two factors found – Language Analysis and Phonology/Orthography – were composed of both L1 skills measured in elementary school and L2 aptitude subtests administered in high school. The authors noted that these findings suggest not only that the L1 and L2 measures are tapping into the same language component, but also that there are long-term relationships between L1 and L2 skills. Moreover, Sparks et al. (2011) found four factors that explained 76% of the variance in L2 proficiency: 1) Language Analysis (included vocabulary, oral and written language comprehension, grammar, and inductive language learning); 2) Phonology/Orthography (included phonetic coding and phonological processing); 3) IQ/Memory (included measures of intelligence [IQ] and paired-associate learning); and 4) Self-Perceptions of Language Skills (included measures of motivation for and anxiety about L2 learning). The authors argue that these findings support the view that L2 aptitude and second language learning are componential in nature.

The concept of foreign language aptitude testing has been around since the 1920s, however it gained major ground in the 1960s when John Carroll and Paul Pimsleur each developed foreign language learning aptitude tests. Pimsleur and colleagues reviewed a span of 30 years of published studies related to linguistic and psychological factors involved in language learning to determine factors that are important for foreign language learning (Pimsleur, et al. 2004). After eight years of testing and research, the researchers determined three core variables to be significantly related to foreign language learning: a) motivation,
defined as “an expression of interest in studying a modern foreign language” (Pimsleur, et al. 2004, p. 16); b) verbal intelligence, which is “the knowledge of words and the ability to reason analytically with verbal materials” (Pimsleur, et al. 2004, p.16); and c) auditory ability, which refers to the reception and processing of information via the ear (Pimsleur, et al. 2004). The result of this research was the development of the *Pimsleur Language Aptitude Battery* (PLAB, Pimsleur, et al. 2004), a six-part assessment of modern foreign language learning aptitude.

Subtests from the PLAB (Pimsleur, 1966) have been used in studies of language aptitude and second language outcomes in a classroom setting (Harley & Hart, 1997) and a more naturalistic setting (Harley & Hart, 2002). Harley and Hart (1997) conducted a study to investigate the interaction between components of language aptitude and L2 outcomes in learners from early and late French immersion programs. The sample consisted of 65 11\textsuperscript{th}-grade students from schools in southern Ontario, half of which began FI in grade 1 (n = 36), and the other in grade 7. Measures of language aptitude were group administered in a single class and consisted of three tests. The first was a test of associative memory, measured by the MLAT-IV Word Pairs subtest. Students then completed a test of memory for text based on a subtest in Wechsler’s (1972) Memory Scale, Form 1, in which students listened to a short narrative text in English and then immediately after listening to the recording were required to write down as much as they could. The third and final test of language aptitude was a test of analytical ability measured by the PLAB Language Analysis subtest (Pimsleur, 1966; see below for detailed description). Four measures of L2 proficiency were used to assess various dimensions of French knowledge and use including vocabulary recognition, listening and reading comprehension, and oral and written production.
Regarding language aptitude, Harley and Hart (1997) noted in their review of the literature that some research has supported the view proposed by Carroll (1981), namely that language aptitude is a stable learner characteristics (for example, Politzer & Weiss, 1969; Skehan, 1988); on the other hand, others have taken the view that previous L2 learning experience, during childhood in particular, can enhance language aptitude (for example, McLaughlin, 1990; Eisenstein, 1980). To explore the “experience” stance on language aptitude, the authors hypothesized that early FI students would have higher language aptitude scores than the late FI students as a result of the greater opportunity in early immersion to develop second language learning strategies. They found that the two groups did not differ significantly on two of the three aptitude tests: the test of associative memory (i.e., Word Pairs subtest) and the measure of memory for text. Interestingly, it was the late FI students who scored significantly higher than early FI students on the test of analytical abilities (i.e., Language Analysis subtest). Significant differences in L2 proficiency, on the other hand, tended to favor the EFI students. Although the two groups did not differ significantly on most measures of L2 proficiency, the EFI group had significantly higher scores on the measure of vocabulary recognition and on sentence repetition (when scored for semantic equivalence rather than exact repetition). Nevertheless, the LFI students scored significantly higher on the written production task in terms of conveying ideas (i.e., written task fulfillment, as opposed to linguistic accuracy).

The authors’ second hypothesis concerned the relationship between the components of language aptitude and L2 proficiency. Harley and Hart (1997) hypothesized that within the early immersion group a positive relationship would hold between L2 outcomes and memory abilities, and in the late immersion group there would be a positive correlation between L2
outcomes and analytical abilities. Pearson product-moment correlations and regression analyses between aptitude and proficiency measures were conducted within each group and, as hypothesized, the relationship between aptitude and proficiency differed for the two groups. Results supported the authors’ hypothesis, revealing that L2 proficiency outcomes of the early immersion group were more closely associated with memory ability and late immersion outcomes with analytical language ability.

To summarize, Harley and Hart’s (1997) hypothesis that early immersion students would have higher aptitude scores than their late FI counterparts was not supported by their results. The authors suggested the possibility that these results were consistent with the notion of language aptitude as a stable learner characteristic that is relatively resistant to environmental influence. They warn, however, it is also possible that late immersion students were a select group of higher aptitude learners from the outset. Their main findings were that the analytical components of language aptitude (i.e., scores on the PLAB Language Analysis subtest) were more predictive of L2 outcomes than memory measures (i.e., associative memory and memory for text) for LFI students, whereas EFI student’s L2 outcomes were more likely to be associated with memory ability. One interpretation of these results offered by the authors aligns with the notion of maturational constraints on second language acquisition; namely, a reliance on different cognitive abilities depending on the age at which intensive L2 exposure began, with analytical language ability being more closely connected to L2 success for later learners. Alternatively, the authors suggested that the experience and instructional orientation in the two programs might also be a factor, with instruction in early immersion being more holistically oriented while late immersion instruction may involve a heavier initial focus on the structure of the language. The authors noted that the addition of
other components of language aptitude over and above the three measures used in their study, such as phonetic coding ability and auditory ability, would have added predictive value to their analysis, especially in regards to oral measures and listening comprehension measures of L2 proficiency. The present study thus included language aptitude measures not only of analytical abilities, but also measures of verbal and auditory abilities.

Harley and Hart (2002) conducted a follow up study to the research described above aimed at determining the relationship of memory ability and analytical language ability to second language learning in a natural environment, as opposed to a classroom setting, to rule out the possibility that differences found between the early and late immersion groups were the consequence of contextual factors rather than maturational constraints on the language learning process. In other words, the authors hoped to determine whether age or learning context had a stronger influence on students’ language learning orientation. To accomplish this, they conducted a study with 28 English-speaking grade 10 and 11 students from Ontario that were taking part in a three-month bilingual exchange with French-speaking students in Quebec. Measures used were similar to those used in their French immersion study (Harley & Hart, 1997). The authors found that on the language analysis test (i.e., the Language Analysis subtest from Pimsleur’s Language Aptitude Battery, 1966), the late immersion students scored higher than both the early immersion and the core French exchange students. Furthermore, the exchange students’ language analysis scores were positively correlated with several post-exchange French proficiency scores (i.e., cloze test and three oral measures). Harley and Hart (2002) thus suggested that analytical language ability is more intimately related to second language outcomes when intensive second language exposure begins in adolescence, thus providing support to the age of onset argument over the contextual one.
They remarked, however, that caution be taken in interpreting their findings as one outstanding learner was a consistently high performer on all measures, which influenced the significance of some relationships; furthermore, the study sample was relatively small and the duration of the exchange relatively short.

A study further investigating the relationship between verbal analytical ability and second language proficiency was conducted by Abrahamsson and Hyltenstam (2008), who scrutinized the near-native L2 attainment and language aptitude of 42 near-native L2 speakers of Swedish. Their aim was to test a hypothesis first proposed by DeKeyser (2000), namely that in order for late-learners to attain near-native proficiency in a second language they require a high level of verbal analytical ability and, conversely, that this ability is not a significant predictor of successful second language learning in children. Language aptitude was measured using a version of the Swansea LAT (v.2.0; Meara et al., 2003) adapted specifically for Swedish-speakers. This test was composed of five subtests loosely based on the MLAT (Carroll & Sapon, 1959) designed to measure various aspects of language aptitude: phonetic memory, lexical-morphological analytical skills, grammatical inferencing skills, aural memory for unfamiliar sound sequences, and sound-symbol association. L2 proficiency was assessed with both an auditory and a written grammaticality judgment test to measure participants’ L2 grammatical intuition and processing ability. Early-learners were defined as those participants with an age of onset (AO) between 1 and 11 years (n = 31) and late-learners were the group of participants who’s AO was between 13 and 23 years (n = 11). Regarding language aptitude, the researchers hypothesized that all near-native participants with a late AO for second language learning would have above-average aptitude while early AO and native controls would have normally distributed aptitude scores. This hypothesis was
supported by their findings. In sum, Abrahmsson and Hyltenstam (2008) found that the late-learner group had a significantly higher aptitude mean score than the early-learner group, thus determined that above-average degree of language aptitude was required for late-learners to achieve native-like proficiency in their L2, whereas this was not a necessary condition for a child learner to eventually pass for a native speaker. Abrahamsson and Hyltenstam (2008) concluded that language-learning aptitude might help explain apparent exceptions to age effects and Sensitive Periods for L2 learning.

As part of their investigation of Sensitive Periods for second language learning (study described above), Granena and Long (2012) also examined the potential mediating role of language aptitude (as measured by the LLAMA test, Meara, 2005) at various ages in the domains of phonology, lexis and collocation, and morphosyntax. It was found that on average language aptitude scores were highest for the earliest group, age of onset (AO) 3-6 \((M = 58.56)\), followed by the AO 7-15 group \((M = 48.16)\) and finally the AO 16-29 group \((M = 45.49)\). Further, the authors hypothesized that aptitude would not be related to scores in the domain of phonology or morphosyntax for learners of any AO, but that it would be related to scores in the lexical and collocation domain for late learners \((AO > 16)\). Counter to their hypothesis, Granena and Long (2012) found that for the AO 16-29 group aptitude was significantly correlated with the domain of phonology and of lexis and collocation, but not with the domain of morphosyntax; they did not find any significant correlations between aptitude and scores in the three domains for any of the other AO groups. Overall, these results differ from those found by DeKeyser (2000) and Abrahamsson and Hyltenstam (2008). While both DeKeyser (2000) and Abrahamsson and Hyltenstam (2008) predicted different levels of aptitude required for second language attainment depending on age, and
offered evidence of such via a significant positive relationship between language aptitude and scores in the grammatical domain among late but not early starters, Granena and Long (2012) did not find any significant relationship between aptitude and ultimate morphosyntactic attainment in any AO group. The authors suggested that differences between these studies could be due to ceiling effects, methodological differences, or the nature of the subtests; namely, aptitude measures and the grammaticality judgment task used in studies by DeKeyser tapped into the underlying analytic component of language aptitude while tests of grammatical ability in studies by Granena and Long (Granena 2013; Granena & Long 2012) tapped into participants’ implicit or automatized L2 knowledge. Furthermore, they noted that given different aptitude tests were used in the studies it is possible conflicting results arose because researchers had assessed different dimensions of language aptitude.

It is surprising that Granena and Long (2012) found the earliest AO group to have the highest language aptitude scores. This finding could be interpreted as support for the “experience” hypothesis proposed by Harley and Hart (1997); however, it also conflicts with Harley and Hart’s (1997) finding that early learners did not have higher aptitude scores than their late learner counterparts. Although Granena and Long (2012) offer evidence that early learners in a naturalistic environment have higher language aptitude than later learners, the larger body of research tends to support the notion that late learners’ second language outcomes are associated with their degree of language aptitude, while early learners’ language outcomes are not as closely associated with language aptitude (Harley & Hart, 1997; Harley & Hart, 2002; Dekeyser, 2000; Abrahamsson & Hyltenstam, 2008). As suggested by previous researchers, it is possible that those who chose to begin learning a foreign language later in life (and stick with it) do so because they have an aptitude for
learning languages and thus are a self-selected group of high aptitude individuals. It is predicted in the current study that results will follow the more common trend, namely that late learners’ language outcomes will be more closely associated with language aptitude than early learners’ outcomes. Given that participants in the present study are most similar to those in the Harley and Hart (1997) study, it is expected that LFI students will have stronger analytical language abilities than their EFI counterparts. Alternatively, given that students being tested are those remaining near the end of the FI program, it is possible that they are a self-selected group of high language aptitude learners, thus it is possible that the two groups may not differ significantly in overall language aptitude. The present study will contribute to our understanding of the interaction between language aptitude and age of onset in terms of second language attainment.

1.4 Affective factors (Motivation)

In addition to L2 aptitude, affective variables such as motivation, language anxiety, interest and attitudes toward the learning environment play a role in successful second language learning (See for example, Gardner & Lambert, 1985; Gardner & MacIntyre, 1993; Gardner et al., 1997; MacIntyre, 2002; Masgoret & Gardner, 2003; Dörnyei, 2003; Gardner, 2005). Several approaches to the understanding of foreign language learning motivation have been proposed over the years, including Dörnyei’s (2005) L2 Motivational Self System and an expectancy-value theory (see for example, Oxford & Shearin, 1996; Tremblay & Gardner, 1995); however, the theoretical framework most commonly cited in the literature and used in research on motivation in second language learning is Gardner’s Socio-Educational Model of second language acquisition (for a review, see Gardner, 2005; MacIntyre, 2002). In this model it is proposed that levels of motivation to learn a second language are influenced and
maintained by attitudes toward the learning situation, integrativeness (i.e., openness to other cultures), and instrumentality (i.e., practical reasons for learning the language; Gardner, 2005). Motivation and ability (i.e., intelligence and language aptitude) are the two primary variables responsible for individual differences in language achievement, but language anxiety can also influence language achievement (Gardner, 2005).

Gardner and Lambert (1959) observed that there is a substantial amount of variability when measures of aptitude are correlated with achievement in language courses. From this, they deduced that success in foreign language learning must also involve variables above and beyond linguistic aptitude. They conducted an exploratory study with 75 English-speaking grade 11 Montreal high school students who had completed an average of seven years of formal training in French. Variables included achievement ratings and scores on measures of linguistic aptitude and verbal intelligence. Achievement ratings were provided by teachers using a 5-point scale (poor, 1 to excellent, 5) on students’ French oral skills (i.e., their ability to imitate French word sounds) and their French listening comprehension. Language aptitude was measured using Carroll’s “Psi-Lambda Foreign Language Aptitude Battery” which included five subtests: number learning, phonetic script, spelling clues, words in sentences, and paired associates. Verbal intelligence was measured using same-opposites and verbal analogies tests. In addition, measures included tests on a variety of attitudinal and motivational characteristics. First, an orientation index asked students to rank the personal relevance of each of four alternative reasons for studying French. Two of the alternatives were considered instrumental reasons (i.e., “useful in obtaining a job” and “make one a better-educated person”) and two were integrative reasons (i.e., “be helpful in understanding the French-Canadian people and their way of life” and “permit meeting and conversing with
more and varied people”). Next, students completed an attitude scale in which they had to rate their level of agreement on a seven-point scale regarding 20 statements pertaining to French-Canadians. Finally, a measure of motivational intensity was also administered. Gardner and Lambert’s (1959) analysis revealed two independent factors that were equally related to achievement ratings in French: 1) a linguistic aptitude factor; and 2) a motivation factor, “characterized by a willingness to be like valued members of the language community” (Gardner & Lambert, 1959, p. 271). They also found that students with an integrative orientation generally had higher French achievement than those who were instrumentally oriented, and had more positive attitudes toward French-Canadians and a stronger motivation to acquire their language.

Gardner and Lambert’s (1959) seminal paper on motivation in second language acquisition sparked much research on the role of affective factors in second language learning. Masgoret and Gardner (2003) conducted a meta-analysis of studies by Gardner and associates regarding attitudes, motivation, and second language learning. A total of 75 independent samples were examined in the meta-analysis, which involved a total of close to 10,500 participants. Their meta-analysis revealed consistently positive relationships between measures of achievement in a second language and the variables of attitude and motivation (i.e., integrativeness, attitudes toward the learning situation, motivation, integrative orientation, and instrumental orientation). They found the highest correlations occurred between achievement and motivation (which were uniformly higher than correlations between achievement and each of the other variables of attitude and orientation), and neither age nor availability of the language in the environment had moderating effects on the
correlations. The meta-analysis strongly suggests that motivation is predictive of achievement in foreign language learning.

As was originally found by Gardner and Lambert (1959), more recent studies on motivation have continued to point towards integrativeness as the motivational dimension that relates most strongly to achievement in second language learning. In 2005, Csizér and Dörnyei aimed to elucidate second language learners’ motivational profiles via cluster analysis. The researchers surveyed a total of 8,593 13-14 year old Hungarian students regarding their attitudes toward five target languages (English, German, French, Italian, Russian) and toward six L2 communities (the United States, the United Kingdom, Germany, France, Italy, and Russia). Their cluster analysis revealed four broad motivational profiles characterizing learners. Group 1 consisted of the least motivated learners, all of whom scored lower than average on all motivational scales concerning the target languages and L2 communities. Group 4 was at the other end of the spectrum, and contained students who scored higher than average on every motivational scale and were thus deemed the most motivated learners. Results for Group 2 and Group 3 were mixed. Although Group 3 had higher overall motivation than Group 2, Group 2 members were more associated with the affective side of motivation while Group 3 members were more associated with the pragmatic side.

Csizér and Dörnyei (2005) suggested that students in the group of most motivated learners had developed a strong and clear “ideal L2 self” (previously interpreted as integrative motivation, this was defined as one’s ideal self being associated with mastery of an L2; for a review see Dörnyei, 2005, Csizer & Dörnyei, 2005), while those in Group 3 had an “ought-to-L2-self” (defined as a more extrinsic, less internalized counterpart of the ideal
L2 self, guided by attributes one believes one ought to possess rather than what one desires; for a review see Dörnyei, 2005, Csizer & Dörnyei, 2005) and neither Group 2 or 3 had developed a salient ideal L2 self. The authors argued that those in Group 2 had not developed an ideal L2 self due to lack of a professional future relevance of the L2, and members in Group 3 were inhibited from developing an ideal L2 self because their motivation was more extrinsic and less internalized. These results highlight the importance of “integrativeness” in second language learning motivation given that those who possessed integrative motivation were the most motivated learners and were more motivated than those who had a more instrumental (i.e., extrinsic and less internalized) motivation.

Research investigating English language learners has also tended to support the notion that integrative motivation is more important to second language achievement than instrumental motivation. Samad, Etemadzadeh, and Far (2012), found that integrative motivation was significantly correlated with proficiency in learning a foreign language, while instrumental motivation was not. Furthermore, the majority of high achievers were integratively motivated (57%), while the majority of low achievers were instrumentally motivated (76%). Similarly, Özgür and Griffiths (2013) found that instrumental motivation was not significantly correlated with success in language testing. Instead, intrinsic motives (i.e., own satisfaction and self-improvement) as well as integrative motives (i.e., culture and foreign friends) were significantly positively correlated with second language outcomes. Results from these studies (Gardner & Lambert, 1959; Csizer & Dörnyei, 2005; Samad et al., 2012; Özgür & Griffiths, 2013) support the notion that integrativeness is the motivational factor that relates most strongly to second language achievement.
The same does not necessarily hold true, however, in the French immersion setting. A study on the role of motivation in the context of French immersion programs, thus more closely related to the current study, was conducted by Marangelli in 2001. The author examined the relationship of attitudes and motivation to French language achievement in a group of 53 sixth grade French immersion students from four elementary schools in Eastern Canada. Attitudes and motivation were measured using Gardner’s Attitude/Motivation Test Battery (AMTB) and achievement measures included students’ report card grades in French Language Arts (reading, writing, oral communication) and results from a cloze French L2 achievement test. The author found that attitudes toward French, desire to learn French, interest in foreign languages and motivational intensity (subscales from the AMTB) showed positive correlations with achievement, while French use anxiety correlated negatively with achievement. Interestingly, she found that integrative motivation did not correlate significantly with achievement. The author speculated that in the FI setting it is often the parents’ decision to enroll the students in the FI program and thus suggested that it may not be a logical expectation that students in these programs have integrative or instrumental motivation.

To further shed light on the motivational profiles of students in French immersion programs, Wesley (2009) investigated the language learning motivation of six sixth-grade elementary school graduates of a one-way total French immersion program in a public school in the United States. Traditionally this program is defined as one that offers 100% L2 instruction in the early grades followed by an introduction of L1 instruction in grade 2 through grade 5, increasing every year (Genesee, 2008). Wesely (2009) remarked that there have been contradictory findings in immersion contexts in regards to integrativeness in
Gardner’s socio-educational model. More specifically, she noted that some studies in the immersion setting have not supported the notion that integrativeness is important to second language acquisition (e.g., Marangelli, 2001; Strong, 1984).

In her interpretive multiple case study, Wesely (2009) collected data via a modified Attitude/Motivation Test Battery (AMTB, Gardner, 1985), a parent survey, individual interviews and a group interview. The author’s qualitative analysis of the data revealed that integrative and instrumental orientations were not mutually independent in this group of students; all students expressed both types of reasons for learning a second language. In other words, students often combined instrumental and integrative orientations or emphasized these attributes in a way that diverged from what would typically be expected in the L2 learning motivation field. She also found that the students’ learning situation, particularly their relationship with their teachers and importantly their peers, were influential factors in their reflections on L2 learning. The author thus concluded that in the immersion context, “the socio-educational model does indeed reflect some important aspects of how students think about and reflect on their language learning motivation” (p. 278).

In sum, the literature supports the notion presented in Gardner’s Socio-Educational Model that motivation is one of the two major variables contributing to individual differences in achievement in the context of language learning (Gardner, 2005). Furthermore, research tends to suggest that integrativeness is most closely tied to achievement in foreign language learning; however, this pattern has not always held true in the context of French immersion. Findings from Marangelli (2001) and Wesley (2009) suggest that students’ attitudes and motivation in a French immersion setting might differ from those in foreign language classrooms or from English language learners. To the best of my knowledge, no study
comparing early and late French immersion students’ attitudes and motivation for learning French has been conducted, nor has there been a study investigating the attitudes and motivation of students nearing the end of the FI program. The current study will contribute to the identification of differences in the motivational profiles of early versus late French immersion students. Additionally, it will contribute to our understanding of the role of motivation on foreign language outcomes in the context of French immersion programs.

1.5 The Current Study

Though there has been a fair amount of foreign language aptitude and motivation research conducted since the 1960s, research in the context of French immersion programs conducted in Western Canada is sparse. Furthermore, as Marangelli (2001) and Wesely (2009) highlighted, findings within the French immersion context are not always consistent with those in the larger body of research on foreign language learning. More current research is needed to investigate the role of language aptitude and motivation in second language acquisition in the context of various French immersion programs. Thus, the aim of the current study was to investigate the relationship between the components of language aptitude and motivation, and second language outcomes in early French immersion (FI) versus late FI programs in Western Canada.

The present study investigated early and late French immersion students nearing the end of their FI studies, namely grade 11 students. Evidently, not all students are successful L2 learners; as noted above, attrition from French immersion programs in B.C. is a relatively common phenomenon. As a result, some may argue that the remaining students in French immersion at the grade 11 level are those that have been successful throughout the program. Even if this is so, variation is likely to exist across the entire group of students (i.e. both early
and late FI students), such that some students will perform better than others on French language proficiency tasks. In their commentary on individual differences in second language learning, Roberts and Meyer (2012) noted:

[...] even in similar learning environments learners differ greatly in how quickly they pick up a language and in their ultimate attainment level of proficiency. For purposes of selecting and advising learners, and for identifying those who may require specific types of intervention, it would be extremely useful to be able to predict how quickly and how well an individual learner will acquire a new language and which type of instruction would suit them best. (p. 1)

Individual differences, such as language aptitude and motivation, and the unique experiences of each student will make it such that French language achievement will not be uniform across the group of students in the current study. Therefore, it is important to determine factors that correlate with this possible variation in French language skills and to determine whether early and late FI students differ in terms of foreign language aptitude and motivation to learn a foreign language. The following research questions were addressed:

RQ1: How do early French immersion (EFI) students compare to late French immersion (LFI) students in foreign language aptitude?

HY1: EFI and LFI students will have comparable overall levels of aptitude; however, LFI will have higher analytical abilities as measured by the PLAB Language Analysis subtest because older second language learners rely more on general cognitive skills than language specific skills for second language learning.

RQ2: How do EFI compare to LFI students in attitudes and motivation for learning French in a French immersion setting?

HY2: LFI students will reveal more positive attitudes and higher motivation for learning French than EFI students. LFI students are more likely to have been a part of the decision to participate in the French immersion program.
**RQ3:** How do language aptitude and motivation relate to achievement in French language learning in the context of French immersion programs as measured by French vocabulary, listening comprehension, grammaticality judgment, and pronunciation?

**HY3:** Language aptitude and motivation will have a positive association with French language achievement. As language aptitude and motivation increase, French language achievement is expected to increase as well, since these factors are predictive of achievement in foreign language learning.
2. Methods

2.1 Participants

The sample for this quasi-experimental study consisted of 83 grade 11 students. The majority of participants had studied in the early French immersion program (n = 56), while the remainder studied in the late French immersion program (n = 27). Participants were all age 16 to 17 (M = 16.6; i.e., 16 years 6 months). There was a comparable distribution of male and female students in the early (males = 35.7%) and late (males = 29.6%) immersion groups. Participants were recruited from two different high schools within a single school district in Metro Vancouver, British Columbia. Students were eligible to participate in the study if they were enrolled in grade 11 in a French immersion program and had entered French immersion either in Kindergarten, grade 1 (early immersion), or grade 6 (late immersion). Participants were excluded from the study if they had French as a native language, spoke French at home on a daily basis, or had a history of speech, language, hearing, or cognitive disorders.

Pearson’s chi-square tests were conducted to determine whether parents’ level of education and/or approximate level of household income were associated with French immersion program. There was no statistically significant association between French immersion program and Mother’s Level of Education, $\chi(7) = 8.88, p > .05$, or Father’s level of Education, $\chi(6) = 7.91, p > .05$; that is, parents of students in both EFI and LFI did not differ significantly in their level of education. Similarly, there was no statistically significant association between French immersion program and approximate level of household income; that is, household income did not differ significantly across the two groups, $\chi(6) = 5.11, p > .05$. In sum, there were no significant differences in parent level of education or household
income between the early and late FI groups.

2.2 Materials

Participants were asked to complete a brief background questionnaire (see Appendix A) and an online language history questionnaire (LHQ 2.0, Li, Zhang, Tsai, & Puls, 2013; see Appendix B). The background questionnaire was used to collect information regarding the participant’s program of study (i.e., early or late FI), reasons for entering French immersion, languages spoken, primary language spoken at home, parent level of education, and approximate household income. The language history questionnaire was developed by researchers at the University of Pennsylvania specifically for research purposes in the field of second language acquisition. It addressed aspects such as the participant’s language acquisition and use, language environment, and self-rated language abilities.

2.2.1 Language Aptitude Measure

The Pimsleur Language Aptitude Battery (PLAB, Pimsleur, et al. 2004) and the Modern Language Aptitude Test (MLAT, Carroll & Sapon, 1959) were the most commonly used measures of language aptitude in research investigating language aptitude for foreign language learning (e.g., Ehrman & Oxford, 1995; Harley & Hart, 1997; Dekeyser, 2000; Harley & Hart, 2002; Sparks, Patton & Ganschow, 2011). Skehan (2002) noted that while the MLAT (Carroll & Sapon, 1959) remained the most influential aptitude measurement battery, the most widely used alternative or complementary aptitude measure was Pimsleur’s Language Aptitude Battery (Pimsleur, 1966b). Furthermore, Harley and Hart (2002) remarked that both of these measures were recognized as strong predictors of foreign language outcomes for adult and adolescent second language learners in a classroom context. Moreover, the MLAT (Carroll & Sapon, 1959) is currently only available to government
agencies, missionary groups, and licensed clinical psychologists. A third alternative to the MLAT (Carroll & Sapon, 1959) and the PLAB (Pimsleur et al., 2004) was the LLAMA test (Meara, 2005; for review see Granena & Long, 2012; Granena, 2013), which was loosely based on the MLAT (Carroll & Sapon, 1959). The LLAMA test (and its former version, the Swansea Language Aptitude Test, Meara, Milton, & Lorenzo-Dus, 2003) had been increasingly used in several research studies (e.g., Abrahamsson & Hyltenstam, 2008; Bylund, Abrahamsson, & Hyltenstam, 2012; Granena & Long, 2012). The LLAMA test (Meara, 2005) had not been extensively standardized, however, and was a computer-based test. For our research purposes of efficiency in data collection and group administration, we desired a well-established, paper-and-pencil test of language aptitude. The PLAB (Pimsleur et al., 2004) has these features, and was designed for and best suited to our age group, thus it was the chosen measure of language aptitude for this study.

The PLAB (Pimsleur et al., 2004) was intended for use in grades seven through 12 and was comprised of six sections. Split-half reliability coefficients reported in the PLAB manual for parts three through six ranged from .57 to .82, with a median of .76 (Pimsleur et al., 2004).

2.2.1.1 Academic Grades

The first section pertained to academic grades and had a maximum possible score of 16. Students were asked to report their most recent grades in English, Social Studies, Math, and Science. This was used as an estimate of their overall academic performance in academic areas other than foreign languages.
2.2.1.2 Interest in Foreign Language

Section two asked students to give an estimate of how interested they were in studying a modern foreign language. This was achieved through one 5-point Likert scale rating and was scored out of 8. This rating was calculated into the Total Aptitude score, but was not independently used as a measure of motivation for learning a foreign language given that a separate assessment on motivation was administered.

2.2.1.3 Verbal Ability

Sections three and four measured verbal ability via vocabulary and language analysis tasks.

Vocabulary: In the vocabulary task, students had to identify the correct synonym to match a given word for each of 24 multiple-choice items in English, leading to a possible maximum score of 24 points. Students had four minutes in which to complete this test.

Language Analysis: In the language analysis section, students were given a short list of words in an unknown language along with the English equivalents and had to infer how the presented language system worked. For each of 15 multiple-choice items, a stimulus statement was presented in English and students had to select the correct way of expressing the statement in the new language from four possible renditions. The subtest was out of 15. Students had 10 minutes to complete this test.

2.2.1.4 Auditory Ability

Finally, sections five and six measured auditory ability through sound discrimination and sound-symbol association tasks.

Sound Discrimination: The sound discrimination task required students to distinguish between two to three similar sounding words in a foreign language (Ewe, a West African
language) in the context of short phrases. Administration time for this test was 11 minutes and the maximum possible score was 30 points.

**Sound Symbol Association:** In the sound-symbol association test, students were tasked with selecting one of four written words that correctly matched the verbally presented word for each of 24 multiple-choice items. This test was out of 24 and was five minutes in duration.

### 2.2.1.5 Total Aptitude

The Total Aptitude score was the combined score on all six sections of the PLAB (Pimsleur et al., 2004), leading to a maximum possible score of 117 points.

### 2.2.2 Motivation Measure

Motivation was measured using the Attitude/Motivation Test Battery (AMTB, Gardner, 1985). The AMTB was designed for grade seven to 11 Canadian, English speaking students learning French (Gardner, 1985). The development of the Attitude/Motivation Test Battery stems from 20 years of research, primarily investigating English-speaking students learning French as a second language (Gardner, 1985). Given that the current study is an investigation of Grade 11 Canadian, English-speaking students learning French - the same population for which the AMTB was designed - this measure of motivation was deemed as the most suitable choice among the available options. This measure was composed of 19 subtests, which assessed the following variables: a) attitudes toward the learning situation (i.e., attitudes toward the language learning context); b) integrativeness (i.e., willingness to identify with a different language community); c) motivation (i.e., goal-directed behavior and motivation to learn French); and d) attitude/motivation index (i.e., major attitudinal/motivational features associated with second language proficiency) (Masgoret & Gardner, 2003; Gardner, 1985). Four composite scores, one for each of the variables, are
derived from combinations of the 19 subtests. In the AMTB Technical Report (1985), Gardner reported measures of reliability calculated on a normative sample taken from seven sites across Canada with approximately 1000 students from each grade level; the median internal consistency reliability was .85, with the measure of Instrumental Orientation being one scale with relatively lower reliability (Gardner, 1985).

The AMTB (Gardner, 1985), a questionnaire style test battery, is divided into three sections. In part one, students give ratings on a seven-point Likert scale (i.e., strongly disagree to strongly agree) for 63 statements pertaining to attitudes toward French Canadians, interest in foreign languages, attitudes toward European French people, attitudes toward learning French, integrative orientation, instrumental orientation, French class anxiety, and parental encouragement. Part two is composed of 21 multiple-choice items regarding motivational intensity, desire to learn, and orientation, in which students were asked to choose the alternative that best described them for each item. Part three is composed of eight subtests presented in a semantic differential format (e.g., inefficient – efficient). Four subtests pertain to the French teacher (i.e., Evaluation, Rapport, Competence, and Inspiration) and four to the French course (i.e, Evaluation, Difficulty, Utility, and Interest). Questions in each of the three sections were presented in a randomized order. Four composite scores are derived from various combinations of subtests in the questionnaire.

2.2.2.1 Integrativeness: An “Integrativeness” score is the sum of “Attitudes toward French Canadians,” “Attitudes toward European French,” “Integrative Orientation,” and “Interest in Foreign Languages.” The maximum possible score is 238.
2.2.2.2 *Motivation:* A “Motivation” composite score is the sum of “Motivational Intensity,” “Desire to Learn,” and “Attitudes Toward Learning French.” The maximum possible score is 130.

2.2.2.3 *Attitudes Toward the Learning Situation:* The “Attitudes Toward the Learning Situation” score is the combination of “French Teacher Evaluation” and “French Course Evaluation.” The maximum possible score is 140.

2.2.2.4 *Attitude/Motivation Index:* Finally, an “Attitude/Motivation Index” is calculated by combining the three above composite scores (i.e., Integrativeness, Motivation, and Attitudes Toward the Learning Situation) with “French Class Anxiety” (negatively weighted) and “Instrumental Orientation.” The maximum possible score is 571.

2.2.3 *French Language Proficiency Measures*

French language proficiency was assessed using the following four measures. Due to the wide variety of native languages spoken in our community, it was not feasible in our context to test proficiency in all the present native languages. Given that strong native language skills have been shown to correlate with strong foreign language aptitude (Skehan, 1986; Sparks & Ganschow, 2001; Sparks, Patton, & Ganschow, 2012;), we decided to focus on language aptitude instead of native language proficiency for this study.

2.2.3.1 *Vocabulary*

The Échelle de vocabulaire en image Peabody (ÉVIP, Dunn, Dunn & Theriault-Whalen, 1993) is a standardized test of French vocabulary knowledge that was used as a measure of receptive vocabulary. In the task, participants were asked to identify a single picture from an array of four that correctly corresponded to a word presented orally by the
test administrator. The test-retest reliability coefficient for this age group in the manual was .73 (Dunn et al., 1993).

### 2.2.3.2 Listening Comprehension

Listening comprehension was assessed with the Compréhension orale subtest of the *Test de rendement individuel de Wechsler* (WIAT-II, Wechsler, 2007). The listening comprehension subtest of this standardized test is composed of three sections. The first portion was similar to the ÉVIP (Dunn et al., 1993); it requires participants to correctly identify an image from an array of four that corresponds to an orally presented word. In the second task participants have to identify a scene from an array of four choices that corresponds to a spoken phrase. In the final portion, students are orally presented a description or definition of a word along with an image; their task is to provide the word that matches the description and the image. The test-retest reliability coefficient in the manual was .88 for this age group (Wechsler, 2007).

### 2.2.3.3 Grammaticality Judgment

A timed grammaticality judgment task (adapted from Birdsong, 1992) was administered to assess participants’ grammar knowledge. The test consisted of 72 items that were either grammatical or ungrammatical. These items were composed of seven types of morpho-syntactic constructions. Each sentence was presented individually on a laptop screen, and the student was asked to press a key on the keyboard to indicate whether the sentence was grammatical (‘A’ key, marked with a blue sticker) or ungrammatical (‘L’ key, marked with a red sticker). Prior to completing this task, verbal instructions were provided by the test administrator as well as written instructions on the laptop screen. A set of six practice sentences was then presented to train the participant on proper completion of the test.
Participants were instructed to respond as quickly and accurately as possible. Sentences were presented and the accuracy and speed of responses were recorded with E-Prime® Experimental Software (Schneider, Eschman, & Zuccolotto, 2002).

2.2.3.4 Speech Task

The pronunciation measure involved reading a paragraph out loud in the test language (French or English depending on the session). Paragraph readings were audio-recorded and later rated for accent by ten native speakers of each respective language.

2.3 Procedure

Testing took place in the two high schools in a BC School District during the months of February through April. Information from the questionnaires allowed investigators to determine the eligibility of the participant for the study as well as the participant’s program grouping (i.e., EFI vs. LFI). Four trained test administrators conducted all testing in both English and French throughout the three-month data collection period.

The current study was conducted in conjunction with a second study examining French language proficiency outcomes in early and late French immersion students to further test the notion of a Sensitive Period for second language acquisition. As such, participants from this study participated in a total of two individual testing sessions, one in French and one in English. Tests were administered in a quiet, enclosed office or a carrel in the school library, were administered in no particular order within a session, and were typically completed in a single session.

During each student’s first individual testing session, it was explained that part of the study involved completing an online questionnaire regarding his or her language history (e.g., languages learned, at what age they were learned, language environment, context of
use, etc.). Students were asked to provide their email address and were subsequently sent a unique link to the LHQ 2.0 (Li, Zhang, Tsai, & Puls, 2013) along with an identification number for completing the questionnaire so as to maintain the student’s privacy.

The PLAB (Pimsleur et al., 2004) and the AMTB (Gardner, 1985) were group administered with each class, in a quiet classroom during 75-minute French immersion class periods. The PLAB (Pimsleur et al., 2004) was administered first and took approximately 40 minutes to complete. This test was immediately followed by the AMTB (Gardner, 1985), which took another 20 minutes to complete. Spoken directions for administration of the PLAB (Pimsleur et al., 2004) were read from the manual for sections one and two, and recorded instructions were played from a CD for the remainder of the test as per the test manual. Written instructions were included in the AMTB (Gardner, 1985) questionnaire. Upon completion of all tasks and questionnaires, each participant received a $10 iTunes gift card as a thank you for their participation in the study.
3. Results

3.1 Descriptive Data

The aim of the current study was to investigate the relationship between the components of language aptitude and motivation, and second language outcomes in early French immersion (EFI) versus late French immersion (LFI) programs in Western Canada. Before presenting results related to the three research questions, I will discuss data collected from the Background Questionnaire and the Language History Questionnaire 2.0 (Li, Zhang, Tsai, & Puls, 2013) that further describe the sample of 83 grade 11 students that participated in the current study.

3.1.2 Reasons for entering French Immersion

On the Background Questionnaire, students were asked, “Why did you start French Immersion?” A pattern emerged in students’ answers such that six possible alternatives for starting French Immersion could be established (see Figure 1). To determine whether the early and late French immersion groups differed in their reasons for entering the French immersion program a Pearson chi-square test was conducted, as this statistical test allows one to discover if there is a relationship between two categorical variables (i.e., FI program and reason for entering the program). Results revealed a statistically significant association between French immersion program (i.e., EFI or LFI) and reasons for beginning French immersion, $X(5) = 15.53, p < .05$, indicating that the two groups differed significantly in their reasons for entering the French immersion program. As Figure 1 shows, the majority of EFI students (77.8%) reported that it was their parents’ decision to enroll them in French immersion, while less than half the LFI students (48.1%) reported the same. More LFI than EFI students reported personal instrumental and/or integrative motivation for learning French.
(22.2% and 7.4% respectively; for example, “To be able to communicate and express myself to more people [integrative], and to gain a skill that will provide new opportunities [instrumental]” or “To have a better opportunity of getting a government regulated job and to be able to communicate in some European countries” [instrumental]). Similarly, a higher proportion of LFI students (18.5%) than EFI students (7.4%) reported a desire to learn a new language as their reason for entering French immersion. Only students in the EFI program reported choosing French immersion because of a sibling already in the program (5.6%) or having a French relative (1.9%), while only LFI students reported wanting a challenge (11.1%) as their reason for beginning French immersion.

Figure 1. Reason student began FI program, percentage of participants by immersion program
3.1.3 Languages Spoken

All participants spoke both English and French. From the study’s sample, 42% of participants spoke another language at home (either instead of or in addition to English). As can be seen in Figure 2, the majority of participants reported English as their native language (n = 43, 56.6%), with Chinese being the second most common native language reported (n = 20, 26.3%). Other native languages spoken by participants in the sample were Russian (n = 4, 5.3%), Spanish (n = 3, 3.9%), Serbian, Amharic, Tagalog, Bengali, and Punjabi (n = 1, 1.3% for each).

Figure 2. Participant’s native language
Pearson’s chi-square tests were conducted to determine whether parents’ level of education and/or approximate level of household income were associated with being Anglophone. There was no statistically significant association between being Anglophone and Mother’s Level of Education, \(X(7) = 5.57, p > .05\), or Father’s Level of Education, \(X(6) = 10.44, p > .05\); that is, parents who were Anglophone had a similar level of education to those whose native language was not English. There was no statistically significant association between being Anglophone and Approximate Household Income, \(X(7) = 9.28, p > .05\); hence, parents who were Anglophone had a comparable Household Income to those whose native language was not English.

3.2 Analyses of Research Questions and Hypotheses

3.2.1 Language Aptitude

RQ1: How do early French immersion (EFI) students compare to late French immersion (LFI) students in foreign language aptitude?

First, an analysis was conducted to test the hypothesis that early and late French immersion students would have comparable overall levels of aptitude, and that LFI students would have higher analytical abilities as measured by the PLAB language analysis subtest. In exploring the data, it was determined that scores on the Language Analysis and Sound-Symbol Association subtests were not normally distributed, so these were compared via Mann-Whitney U tests (i.e., non-parametric statistical test), while scores on the Vocabulary and Sound Discrimination subtests were normally distributed and so were compared via independent-samples \(t\)-tests. Given that multiple comparisons were made, alpha levels were
adjusted using the Holm-Bonferroni method to control for Type I error (Shaffer, 1995). The results are presented in Table 1.

Table 1. Language aptitude subtests by immersion program

<table>
<thead>
<tr>
<th></th>
<th>Max Score</th>
<th>Early Immersion (n = 56)</th>
<th>Late Immersion (n = 27)</th>
<th>Mann-Whitney U</th>
<th>Significance Level (Two-Tailed asymptotic sig.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Analysis</td>
<td>15</td>
<td>11.00 Mdn</td>
<td>13.00 Mdn</td>
<td>454.00</td>
<td>.003*</td>
</tr>
<tr>
<td>Sound Symbol Assoc.</td>
<td>24</td>
<td>21.00 Mdn</td>
<td>21.00 Mdn</td>
<td>642.50</td>
<td>.261</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>24</td>
<td>14.98 (3.51) M (SD)</td>
<td>15.96 (3.82) M (SD)</td>
<td>-1.16(81)</td>
<td>.250</td>
</tr>
<tr>
<td>Sound Discrimination</td>
<td>30</td>
<td>22.07 (4.75) M (SD)</td>
<td>23.15 (5.44) M (SD)</td>
<td>-.92(81)</td>
<td>.359</td>
</tr>
</tbody>
</table>

* p < .005 (2-tailed)

As Table 1 shows, the LFI group (Mdn = 13.00) performed significantly better than the EFI group (Mdn = 11.00) on the Language Analysis subtest, U = 454.00, z = -2.96, p < .005; this had a medium effect size, r = .32. Conversely, the two groups performed similarly on all other language aptitude subtests.

3.2.2 Affective Factors (Motivation)

**RQ2:** How do EFI compare to LFI students in attitudes and motivation for learning French in a French immersion setting?

Next, the hypothesis was tested that LFI students would reveal more positive attitudes and higher motivation for learning French than EFI students by analyzing results from the Attitude/Motivation Test Battery (Gardner, 1985). Given that results were normally distributed, independent-samples t-tests comparing the early French immersion group to the late French immersion group were conducted for all four composite scores of attitude and

1 It should be noted that in all comparisons presented regarding both Research Question 1 and 2, Levene’s test for equality of variances was not significant, thus the assumption of homogeneity of variance was satisfied.
motivation toward learning French (i.e., Integrativeness, Motivation, Attitude Toward the Learning Situation, and Attitude/Motivation Index).

Table 2. Motivation by immersion program

<table>
<thead>
<tr>
<th>Max Score</th>
<th>Early Immersion (n = 56)</th>
<th>Late Immersion (n = 27)</th>
<th>Significance Level (Two-Tailed t Test)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>t(df)</td>
</tr>
<tr>
<td>Integrativeness</td>
<td>238 172.07 (21.21)</td>
<td>168.26 (26.10)</td>
<td>.71(81)</td>
</tr>
<tr>
<td>Motivation</td>
<td>130 93.36 (17.49)</td>
<td>96.81 (19.07)</td>
<td>-.82(81)</td>
</tr>
<tr>
<td>Attitude Toward the Learning Situation a</td>
<td>140 111.07 (17.10)</td>
<td>116.48 (16.24)</td>
<td>-1.33(78)</td>
</tr>
<tr>
<td>Attitude/Motivation Index a</td>
<td>571 420.16 (52.95)</td>
<td>433.76 (49.03)</td>
<td>-1.09(78)</td>
</tr>
</tbody>
</table>

a. (missing data, EFI, n = 55; LFI n = 25)
* p < .005 (2-tailed)

Table 2 shows the late French immersion students’ overall attitudes and level of motivation on average were not significantly different than those of the early immersion students. These results did not support the hypothesis that LFI students would reveal more positive attitudes and higher motivation for learning French than EFI students.

3.2.3. French Language Achievement

RQ3: How do language aptitude and motivation relate to achievement in French language learning in the context of French immersion programs as measured by French vocabulary, listening comprehension, grammaticality judgment, and pronunciation?

To test the hypothesis that language aptitude and motivation would be associated with French language achievement, correlations were conducted between the four measures of French proficiency and the measures of language aptitude and motivation. These correlations were done by group (EFI and LFI) to determine similarities and differences in learner
profiles across the two programs. Results from students’ performance on the four measures of French language proficiency are presented in Table 3.

### Table 3. French Achievement by immersion program

<table>
<thead>
<tr>
<th></th>
<th>Max Score</th>
<th>Early Immersion (n = 56)</th>
<th>Late Immersion (n = 27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Vocabulary</td>
<td>170</td>
<td>124.77 (16.63)</td>
<td>119.30 (20.39)</td>
</tr>
<tr>
<td>Listening Comprehension</td>
<td>41</td>
<td>25.80 (3.29)</td>
<td>26.11 (3.42)</td>
</tr>
<tr>
<td>Grammaticality Judgment</td>
<td>72</td>
<td>44.02 (3.19)</td>
<td>43.44 (3.56)</td>
</tr>
<tr>
<td>French Accent</td>
<td>9</td>
<td>4.84 (0.65)</td>
<td>4.81 (0.76)</td>
</tr>
</tbody>
</table>

Table 4 presents the results of the correlations conducted between French language proficiency measures and measures of language aptitude by immersion program. For the early French immersion group, Pearson-$r$ correlations were conducted between the Verbal Ability, Auditory Ability and Total Aptitude scores and measures of French language proficiency (i.e., vocabulary, listening comprehension, grammaticality judgment, and French accent). For the Late immersion group, Pearson-$r$ correlations were conducted between Verbal Ability scores and scores on French proficiency measures. Because Total Aptitude and Auditory Ability scores were not normally distributed within the LFI group, Spearman’s rank-order correlations were run to determine the relationship between these variables and French proficiency measures.
As Table 4 shows, French vocabulary and listening comprehension were moderately correlated with all aptitude measures within the EFI group. Total Aptitude scores also correlated with French accent scores for the early immersion students. Within the LFI group, French vocabulary and listening comprehension showed strong, positive correlations with Total Aptitude and Verbal Ability; however, Auditory Ability was not significantly correlated with any French proficiency measure. As with the EFI group, Total Aptitude scores correlated with French accent scores for the LFI students. Grammaticality Judgment scores were not significantly correlated with any of the language aptitude measures for either...
group. Figure 3 illustrates a comparison of scores on the French grammaticality judgment task and Total Aptitude scores.

Figure 3. French Grammaticality Judgment scores compared to Total Aptitude Scores

Table 5 presents the results of the Person-$r$ correlations that were conducted between the components of attitudes and motivation for learning French (i.e. Integrativeness, Motivation, Attitudes toward the Learning Situation, the Attitude/Motivation Index) and measures of French language achievement (i.e., vocabulary, listening comprehension, grammaticality judgment, and French accent) within both the EFI and LFI groups. Within the EFI group, a small but significant positive correlation between French accent and the
Motivation composite score (i.e. sum of Motivational Intensity, Desire to Learn, and Attitudes Toward Learning French) was revealed \((r = .32)\). The LFI group, on the other hand, showed significant correlations ranging from .42 to .51 between French accent and three of the AMTB composite scores: Motivation, Attitudes Toward the Learning Situation, and the Attitude/Motivation Index.

Table 5. Pearson correlations of French language proficiency and attitude/motivation by immersion program

<table>
<thead>
<tr>
<th></th>
<th>EFI</th>
<th>Listening Comprehension</th>
<th>Grammaticality Judgment</th>
<th>French Accent</th>
<th>Integrativeness</th>
<th>Motivation</th>
<th>Attitudes Toward Learning Situation</th>
<th>Attitude/Motivation Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFI</td>
<td>Vocabulary</td>
<td>.56**</td>
<td>.43**</td>
<td>.20</td>
<td>.19</td>
<td>.16</td>
<td>-.005</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>Listening Comprehension</td>
<td>.61**</td>
<td>.14</td>
<td>.31*</td>
<td>.15</td>
<td>.26</td>
<td>-.05</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>Grammaticality Judgment</td>
<td>.07</td>
<td>-.19</td>
<td>.02</td>
<td>.06</td>
<td>.09</td>
<td>-.07</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>French Accent</td>
<td>.51**</td>
<td>.48*</td>
<td>-.02</td>
<td>.17</td>
<td>.32*</td>
<td>.07</td>
<td>.25</td>
</tr>
<tr>
<td></td>
<td>Integrativeness</td>
<td>.30</td>
<td>.27</td>
<td>-.11</td>
<td>.35</td>
<td>.72**</td>
<td>.53**</td>
<td>.87**</td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
<td>.32</td>
<td>.32</td>
<td>-.10</td>
<td>.51**</td>
<td>.82**</td>
<td>.63**</td>
<td>.92**</td>
</tr>
<tr>
<td></td>
<td>Attitudes Toward the Learning Situation</td>
<td>-.02</td>
<td>-.04</td>
<td>.24</td>
<td>.42*</td>
<td>.55**</td>
<td>.68**</td>
<td>.79**</td>
</tr>
<tr>
<td></td>
<td>Attitude/Motivation Index</td>
<td>.20</td>
<td>.19</td>
<td>.19</td>
<td>.50*</td>
<td>.86**</td>
<td>.93**</td>
<td>.83**</td>
</tr>
</tbody>
</table>

a. Cases removed pairwise for missing data; EFI, n = 55, LFI, n = 25.
*p < .05 (2-tailed)  **p < .01 (2-tailed)
4. Discussion

4.1 Findings

The aim of the present study was to examine the relationship between the components of language aptitude and motivation, and second language outcomes of grade 11 students from early French immersion (EFI) versus late French immersion (LFI) programs in Western Canada. The study investigated how early and late immersion students compared in foreign language aptitude, in attitudes toward and motivation for learning French, and how these factors related to French language outcomes within each group.

First, EFI and LFI students revealed comparable overall levels of aptitude; the two groups did not differ on the majority of the language aptitude subtests, namely Sound-Symbol Association, Vocabulary, or Sound Discrimination. As hypothesized, however, LFI students had higher analytical abilities as measured by the PLAB (Pimsleur et al., 2004) Language Analysis subtest. In fact, the Language Analysis subtest was the only aptitude subtest that revealed significant group differences related to language aptitude. These results paralleled Harley and Hart’s (1997) language aptitude research which found that grade 11 early and late immersion students did not differ significantly in language aptitude scores on average, but that late immersion students scored significantly higher on the Language Analysis subtest of the PLAB-IV (Pimsleur, 1966). As was suggested by Harley and Hart (1997), this difference may be related to differences in the learning experience and environment for each group. It is possible that EFI students in our study were exposed to a more holistic teaching approach to the French language given that they began learning it at a young age, while older learners in the LFI program may have been exposed to a more form-focused, analytical teaching of the French language. It should be noted that in Harley and
Hart’s (2002) follow-up study, the authors found some evidence that advantages in language analysis skills may be more closely tied to a learner beginning their language studies in adolescence than to the learning context, however various methodological limitations led the authors to advise taking caution in interpreting their results.

The finding that EFI and LFI students did not differ in overall language aptitude on average lends support to the notion that language aptitude is a stable learner characteristic. Conversely, it is possible that attrition from the French immersion program left only those with a high degree of language aptitude remaining in the program. On average, the Total Aptitude score for EFI students was 87.4 and for LFI was 90.7 out of a possible 117 points. Although local norms were not established for the purpose of this study, the PLAB manual (Pimsleur et al., 2004) suggests that students beginning grade 7 with a Total Aptitude score between 70 and 117 - a range which both groups fall well within - have a high probability of success in foreign language learning. In an evaluation of the Pimsleur Language Aptitude Battery as a predictor of student performance, Curtin, Avner and Smith (1983) defined their participants as being “uniformly high-aptitude students”; the mean Total Aptitude score of participants' in their study was approximately 87 points, nearly identical to the average Total Aptitude scores of participants in the current study.

The finding that EFI and LFI students did not differ overall in language aptitude was not consistent with Granena and Long’s (2012) finding that on average language aptitude scores were highest for the earliest group, AO 3-6 years, followed by the AO 7-15 year group, and finally the AO 16-29 year group. If such were the case in our study, we would have expected EFI students (AO = 5 years) to show greater levels of language aptitude than LFI students (AO = 12). Grenena and Long’s (2012) study was conducted with second
language learners in a naturalistic setting, however, and utilized different aptitude measures. It may be that results from the current study are more specific to the classroom setting or French immersion programs in particular. Furthermore, given different aptitude tests were used in the studies it is possible conflicting results occurred because the measures used assessed different dimensions of language aptitude.

Finally, early and late immersion students in the current study did not differ significantly in their attitudes toward or motivation for learning French. It is possible that the measure used was not sensitive enough to detect differences between early and late immersion students’ attitudes and motivation, or that items on the questionnaire were less pertinent to students nearing the end of their French immersion studies. The AMTB (Gardner, 1985) was designed for grade 7 to 11 students studying French in Canada, however, and is a well-established measure of attitudes and motivation to learn a foreign language. Thus, it is doubtful that a lack of difference between the groups is a result of the specific test battery used.

The students that participated in this study were nearing the end of their French immersion studies and it is possible, likely even, that their attitudes and motivation to learn French changed over time; or, those with distinctly different attitudes and levels of motivation self-selected out of the program prior to grade 11. Students had reached a point in the immersion program where French could constitute as little as 25% of their course load. As students begin forming plans for their next steps after high school graduation and French becomes less crucial to their academic success, it is possible that French becomes less important, diminishing attitudes and motivation to learn it. In fact, when asked why they remained in the French immersion program, several students made comments along the lines
of “I’ve come this far, might as well finish the program.” Furthermore, by grade 11 students in French immersion in B.C. have been studying together with no distinction between early and late immersion students for over three years. It is possible that during this time peers had influenced each other’s opinions and attitudes toward learning French such that their attitudes and levels of motivation had become similar, eliminating any group distinctions that may have existed at one time.

Next, how each of these factors (i.e., aptitude and motivation) related to French language outcomes within each group will be discussed. Results from the correlational analyses partially supported the hypothesis that language aptitude and motivation would be associated with French language achievement. In both the EFI and the LFI groups, scores on measures of French language proficiency (i.e., vocabulary and listening comprehension) were associated with scores on language aptitude. Only the EFI students, however, revealed significant correlations between Auditory Ability and measures of French language skills. Contrary to findings related to language aptitude, results from the correlations between levels of motivation and attitudes toward learning French and French language proficiency did not support the hypothesis that French language achievement would be associated with attitudes and motivation; however, attitude and motivation were associated with French accent to a certain degree for both EFI and, more so, LFI students.

Most striking among these results was the relationship revealed between language aptitude and French vocabulary knowledge and listening comprehension in both EFI and LFI groups. French vocabulary and listening comprehension were moderately correlated with all aptitude measures within the EFI group. Within the LFI group, French vocabulary and listening comprehension showed strong, positive correlations with Total Aptitude and Verbal
Ability. Given the distinct performance between grade 7 EFI and LFI students in listening comprehension in their study, Day and Shapson (1988) had suggested that listening comprehension might be a skill that develops more slowly in second language acquisition or that the skill might be tied to the amount of instructional time in the second language. Results from the current study provide a third alternative to Day and Shapson’s (1988) speculations, namely that language aptitude plays an important role in listening comprehension outcomes. Results from the current study suggest that language aptitude relates to French language outcomes regardless of age of onset or amount of time spent studying the language.

Still, it is important to note the nuances of the relationships. Total Aptitude and Verbal Ability were significantly related to French vocabulary and listening comprehension for both groups; however, the relationships were stronger (i.e., had large effect sizes) for the late immersion students, with correlations ranging from .59 to .78, while medium to large effect sizes were revealed in the early immersion group, with correlations ranging from .47 to .55. Total Aptitude was related to French accent outcomes for both early and late immersion students such that as their overall aptitude increased French native-speakers’ rated students’ accents to be more native-like. As with French vocabulary and listening comprehension, the correlation was stronger among the LFI students ($r = .50$, considered a large effect size) than the EFI students ($r = .34$, considered a medium effect size). The differing strengths of the relationships between language aptitude and French language and speech outcomes for late compared to early immersion students suggest that language aptitude may have a stronger association with foreign language outcomes in older learners. This finding is consistent with research on native-like second language attainment conducted by Abrahamsson and Hyltenstam (2008), who determined that an above-average degree of language aptitude was
required for late-learners to achieve native-like proficiency in their L2, whereas this was not a necessary condition for a child learner to eventually pass for a native speaker.

In contrast to the significant relationships between language aptitude and French proficiency measures of vocabulary, listening comprehension, and pronunciation, language aptitude was not found to be significantly related to grammatical knowledge (i.e., scores on the grammaticality judgment task) for either EFI or LFI students. It is possible that the apparent lack of relationship between aptitude and grammatical knowledge is due to the limited spread of scores on the grammaticality judgment task, which limits the potential for relationships between variables (see Figure 3). The grammaticality judgment task had a maximum possible score of 72; scores from the EFI group ranged from 37 to 51 (range = 14), which was nearly identical to the LFI group whose scores ranged from 37 to 50 (range = 13). The test may have been too difficult for the students being tested, which would explain the fact that the highest a student scored on the test was 51/72 (71%) in the EFI group and 50/72 (69%) in the LFI group. The limited range of scores falling within the mid-range of possible scores indicates that sentences were either too easy or too difficult to judge; a more continuous gradation of difficulty among the sentences being judged was needed in order to detect more fine-grained aspects of grammatical knowledge and potential differences between the groups. A more sensitive test would also likely result in a wider range of scores, potentially allowing relationships with language aptitude to be revealed.

Next, it was found that attitude and motivation were related to speech outcomes (i.e., French accent) to a certain degree for both EFI and, more so, LFI students. Results suggest that older learners who were more motivated to learn a foreign language had a higher chance of developing a more native-like accent, whereas motivation was less important for the
development of a more native-like accent in younger learners. Consider Granena and Long’s (2012) research on Sensitive Periods in second language acquisition, which provided evidence of multiple sensitive periods for different language domains and confirmed previous findings that the opportunity for native-like attainment in a second language closes first for phonology. In addition, Turnbull et al. (1998) found that an early start in French immersion had a clear benefit on speaking skills. These findings in conjunction with findings from the current study suggest that motivation may play a critical role in speech outcomes for LFI students.

4.2 Limitations and Future Directions

The current study was conducted in a single school district in one subdivision of a large urban centre in Western Canada that is known to have a particular population profile. Consequently, the generalizability of the results to all of British Columbia is limited. Nonetheless, studies of this nature are often conducted in a restricted region or within a small number of schools. Given that not much research on language aptitude and motivation to learn a foreign language has been conducted within the context of French immersion programs, the current study could be considered an exploratory study that lays the path to larger scale studies in the future. Indeed, it would be interesting if in future research similar studies were conducted in multiple school districts throughout the larger urban area or across sites throughout Western Canada. Such research would allow for broader generalizations of findings regarding the role of language aptitude and motivation in French proficiency outcomes in the context of French immersion programs.

Since language aptitude and motivation were only measured at a single time point, it was not possible to determine whether these two factors changed over time or remained
stable throughout the students’ French immersion experience. Future research could enrich the methodology of the current study by taking measures of language aptitude and motivation at the outset of each program (i.e., in kindergarten, grade 1 or grade 6) and again at the end of the program (i.e., in grade 11 or 12), thus conducting a longitudinal study. An investigation such as this would further our understanding of the nature of both language aptitude and motivation. Additionally, it is likely that individual differences independent of language aptitude and motivation have an influence on students’ French language outcomes. Because aptitude and motivation were the only factors measured, it was not possible in the current study to determine the type and extent to which other individual differences (e.g., learning style, learning strategies, and learning environment) are associated with second language outcomes in the context of French immersion. Where possible, it would be valuable to investigate additional individual differences such as general intelligence (IQ) and native-language proficiency to see if language learning in an immersion context mirrors research conducted by Sparks et al. that showed significant relationships between native-language skills and second-language aptitude and proficiency (see for example, Sparks, Patton & Ganschow, 2012; Sparks et al., 2011; Sparks et al., 2006; Sparks & Ganschow, 2001).

Limitations regarding some of the measures used are also worthy of some attention. The original research investigations and formulations of major concepts for both the Pimsleur Language Aptitude Battery (PLAB, Pimsleur et al., 2004) and the Attitude/Motivation Test Battery (AMTB, Gardner, 1985) were initiated for each in 1958 - over 56 years ago. The first PLAB manual was published in 1966 and the version of the AMTB used in the present research was published in 1985. Although it could be argued that these measure are those that have withstood the test of time, it is possible that the age of these tests had an effect on the
outcomes of the present research. The educational environment and pedagogical approaches have undoubtedly evolved since the development of the PLAB (Pimsleur et al., 2004) and the AMTB (Gardner, 1985). Thus, the relevance of the test items as well as the testing structure and approach may be outdated, affecting outcomes as a result. Future research should consider more current test batteries and testing modalities (e.g., computer based tests) where available, while taking care to investigate the validity and reliability of newer tests.

**Implications**

Findings from the current study support the predictive value of foreign language aptitude testing in the context of French immersion programs. If language aptitude is a stable learner characteristic, as suggested in the literature, and language aptitude correlates with French vocabulary and listening comprehension outcomes for both EFI and LFI students, as the current study shows, educators within the French immersion program can consider utilizing language aptitude testing. Language aptitude tests could be used not only as a predictor of the student’s potential in French immersion, but also as a diagnostic tool to determine the student’s capabilities and areas needing support. If students develop difficulties in learning French, teachers could refer to language aptitude results to help determine the nature of the difficulty. For example, if a student had low language analysis scores, he or she may need extra support in understanding language structure and grammatical concepts.

Furthermore, language aptitude testing could also be helpful to parents and teachers when deciding in which French immersion program to enroll the child, EFI or LFI. Those with low to average language aptitude scores may be encouraged to get an early start in French immersion; conversely, those with high language aptitude can afford to develop their
academic and language skills in the mainstream program for longer given that they have a higher potential for catching up to their early French immersion counterparts in the late French immersion program.

The role of motivation in French language learning within the context of immersion programs was found not to be as significant as was expected. Nonetheless, it is important for educators to note that a student’s degree of motivation will be associated with the native-likeness of their French accent, especially in the case of late-learners. Given that previous research has highlighted the importance of “integrativeness” in second language learning motivation, teachers should be encouraged to incorporate French cultural experiences into their curriculum to foster the development of integrative motivation.

Conclusion

The present study investigated early and late French immersion students nearing the end of their French immersion studies (i.e., in grade 11) to determine whether they differed in terms of language aptitude and motivation, as well as to examine the relationship of these factors to French language outcomes for each group. It was shown that late learners have stronger analytical language abilities than early learners, lending support to the notion that analytical language ability is more closely tied to second language outcomes when intensive second language exposure begins in adolescence. The relationships between language aptitude and French proficiency outcomes for both early and late immersion students indicate that language aptitude relates to French language outcomes regardless of age of onset and is perhaps a better predictor of foreign language outcomes than age or amount of time spent learning a language.
References


Genesee, F. (1976). Comparative evaluation of the early French immersion, grade 7 French immersion and FSL program at the grade 7 level: a follow-up evaluation. *Instructional Services Department, The Protestant School Board of Greater Montreal.*


Appendix A

Background Questionnaire

The language skills of students from Early and Late French immersion programs in BC

Name: ____________________________ ID # ____________

Questions about the Grade 11 Student:

1. When did you begin studying in the French Immersion program?
   Kindergarten    Grade 1    Grade 6    Other __________

2. Why did you start French Immersion?

3. What are the reasons you have remained in the French Immersion program?

4. What was it like when you started (e.g., difficult, easy, frustrating, fun)?

Questions about the parents/primary guardian:

5. What language(s) do you and your parents speak? That is, languages that you can carry a conversation. (Check all that apply)
   You   __ French   __ English   __ Other (specify)
   Mother __ French   __ English   __ Other (specify)
   Father __ French   __ English   __ Other (specify)

6. What language do you speak at home most of the time? _________________

7. Please rate your parents' English proficiency. (Circle)
   MOTHER
   Listening & Speaking No proficiency  1 2 3 4 5 6 7 8 9 Native-like
   Pronunciation/Accent No proficiency  1 2 3 4 5 6 7 8 9 Native-like
   Reading & Writing No proficiency  1 2 3 4 5 6 7 8 9 Native-like
   FATHER
   Listening & Speaking No proficiency  1 2 3 4 5 6 7 8 9 Native-like
   Pronunciation/Accent No proficiency  1 2 3 4 5 6 7 8 9 Native-like
   Reading & Writing No proficiency  1 2 3 4 5 6 7 8 9 Native-like

8. What is the MOTHER/GUARDIAN’S highest level of education completed at this time?
   □ None
   □ Some primary education
   □ Completed primary education
   □ Some high school
   □ Graduated from high school
   □ Some college or trade school
   □ Received associate’s degree or trade certification
   □ Received bachelor’s degree (Major: ____________________________)
Some graduate study
- Received graduate degree
- Other: ________________________________

9. What is the FATHER/GUARDIAN’S highest level of education completed at this time?
- None
- Some primary education
- Completed primary education
- Some high school
- Graduated from high school
- Some college or trade school
- Received associate’s degree or trade certification
- Received bachelor’s degree (Major: ________________________________)
- Some graduate study
- Received graduate degree
- Other: ________________________________

10. Please select your approximate household income:
- Less than $20,000
- $21,000 - $35,000
- $36,000 - $50,000
- $51,000 - $75,000
- $76,000 - $100,000
- $101,000 - $150,000
- $151,000 - $200,000
- More than $200,000

Thank you for your participation!
Appendix B

Language History Questionnaire

(Version 2.0, 2012)

See http://blclab.org/ for online use and credit

Please provide your contact information below

Name: __________________

Email: __________________

Telephone: __________________

Please answer the following questions to the best of your knowledge

1. Age: ________

2. Sex: Male / Female

3. Education (check the highest degree obtained or school level attended; you can write a note such as “attended but did not finish” if that’s the case):
   __ Middle School __ High School
   __ College (e.g., BA/BS)
   __ Graduate School (Master’s Degree) __ Graduate School (PhD/MD/JD) Other (specify): ________

4. Do you speak more than one language? __ Yes __ No

If you answered “No”, you need not continue this form.

If you answered “Yes”, list the languages in order of proficiency (most proficient first):

Languages
5. a. Your country of origin:  
b. Your country of current residence:  

6. If 5(a) and 5(b) are the same, skip to question 7. If 5(a) and 5(b) are different, how long have you been in the country of your current residence?  

__________(years) ___________(months)  

7. If you have lived or travelled in other countries for more than three months, please indicate the name(s) of the country or countries, your length of stay, the language(s) you learned or tried to learn, and the frequency of your use of the language while in that country according to the following scale (circle the number in the table):  

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Very Frequently</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Length of Stay (cumulative)</th>
<th>Language</th>
<th>Frequency of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
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<td></td>
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<td>1 2 3 4 5 6 7</td>
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<td>1 2 3 4 5 6 7</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

8. Rate your language learning abilities. In other words, how good in general do you feel you are at learning new languages (e.g. relative to friends or people you know)?  

<table>
<thead>
<tr>
<th>Very poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Neutral</th>
<th>Good</th>
<th>Very good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

9. Type in the box the age at which you first learned each language in terms of speaking, reading, and writing, and the number of years you have spent learning each language.  

<table>
<thead>
<tr>
<th>Language</th>
<th>Age first learned the language</th>
<th>Number of years spent learning (cumulative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Speaking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reading</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. Type in the box the age at which you started to learn each language in any or all of the following situations (if only one situation is relevant for one language, provide age information for only that situation).

<table>
<thead>
<tr>
<th>Language</th>
<th>At home</th>
<th>At school</th>
<th>After immigrating to the country where spoken</th>
<th>At informal settings (e.g. from nannies or friends)</th>
<th>Through software (e.g. Rosetta Stone)</th>
<th>Other (specify):</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

11. Write down the name of the language(s) used by your teachers for general instruction (e.g. history, math, science) at each schooling level. If you switched language within a given school level, write a note such as “switched from X language to Y language at Grade Y”.

Primary/Elementary School: __________
Secondary/Middle School: __________
High School: __________
College/University: __________

12. Please rate your current ability on reading, writing, speaking, and listening for all languages you know according to the following scale (circle the number in the table):

<table>
<thead>
<tr>
<th>Language</th>
<th>Reading</th>
<th>Writing</th>
<th>Speaking</th>
<th>Listening</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
13. Do you have a foreign accent in the languages you speak? If so, please rate how strong your accent is according to the following scale (circle the number in the table):

<table>
<thead>
<tr>
<th>None</th>
<th>Little</th>
<th>Some</th>
<th>Intermediate</th>
<th>Strong</th>
<th>Very Strong</th>
<th>Extremely Strong</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Language | Strength of accent
---------|---------------------
|         | 1 2 3 4 5 6 7      |
|         | 1 2 3 4 5 6 7      |
|         | 1 2 3 4 5 6 7      |
|         | 1 2 3 4 5 6 7      |

14. Estimate, in terms of hours per day, how often you are currently engaged in the following activities for each language you know (write the name of the language). If you are not currently engaged in an activity using that language, write down “0”.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Language:</th>
<th>Language:</th>
<th>Language:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen to Radio/ Watching TV:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
</tr>
<tr>
<td>Reading for fun:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
</tr>
<tr>
<td>Reading for work:</td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
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<tr>
<td>Reading on the Internet:</td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
</tr>
<tr>
<td>Writing emails to friends:</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
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<tr>
<td>Writing articles/papers:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
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<tr>
<td>Other (specify):</td>
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<tr>
<td></td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
<td>__________(hrs)</td>
</tr>
</tbody>
</table>

15. Estimate, in terms of hours per day, how often you speak your languages currently with the following people.

<table>
<thead>
<tr>
<th>Language</th>
<th>Family Members</th>
<th>Friends</th>
<th>Classmates</th>
<th>Co-workers</th>
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</tbody>
</table>

73
16. In which language (among your two best languages) do you feel you usually do better or feel more comfortable? Write the name of the language under each condition.

<table>
<thead>
<tr>
<th>Speaking</th>
<th>At home</th>
<th>At work/At school</th>
<th>At party or other social context</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Writing</th>
<th>At home</th>
<th>At work/At school</th>
<th>At party or other social context</th>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading</th>
<th>At home</th>
<th>At work/At school</th>
<th>At party or other social context</th>
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</thead>
<tbody>
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</tbody>
</table>

17. How often do you use your languages for the following activities? Circle the number in the table according to the scale below.

<table>
<thead>
<tr>
<th>Language</th>
<th>Never</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Very Frequently</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arithmetic (e.g. count, add, multiply)</th>
<th>Remember numbers (e.g., student ID, telephone)</th>
<th>Dream</th>
<th>Think</th>
<th>Talk to yourself</th>
<th>Express anger or affection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dream</th>
<th>Think</th>
<th>Talk to yourself</th>
<th>Express anger or affection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>

18. Do you feel that you are bicultural or multicultural (e.g. growing up with parents or relatives from different cultures, or you lived in different cultures for extended periods of time)?

__ Yes __ No

If you answered “No”, skip to question 19. If you answered “Yes”, which culture (and its language) do you identify yourself more strongly with? Use the following examples as a way to indicate your strength of cultural identification. Circle the number in the table.

<table>
<thead>
<tr>
<th>None</th>
<th>Very Weak</th>
<th>Weak</th>
<th>Intermediate</th>
<th>Strong</th>
<th>Very Strong</th>
<th>Extremely Strong</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Culture and its Language</td>
<td>Like its food</td>
<td>Like its music</td>
<td>Like its art</td>
<td>Like its cities and landmarks</td>
<td>Will root for its Athletic Teams</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
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<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
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<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

19. What proportion of your current friends are speakers of the languages that you know well? Indicate below the language they speak and the percentage of them among the total number of friends you have (i.e., total percent should add to 100%).

<table>
<thead>
<tr>
<th>Language</th>
<th>Percent among total number of friends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. If there is anything else that you feel is interesting or important about your language background or language use, please comment below.

21. Are there additional questions that you feel are not included above? If yes, please write down your questions and answers below.