

**A Search for “*Immersionese*”:  
Identifying French Immersion Accents in BC**

**by**

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## Abstract

The purpose of this investigation was to determine whether French immersion experience leads to a distinct, recognizable accent. Five native speakers of French, teaching in the Department of French at Simon Fraser University rated and evaluated the word, sentence and narrative utterances of 17 L2 French speakers living in a non-francophone environment, who completed either high school French immersion or Core French (FSL). Using first a 1 (poor) to 5 (excellent) rating task for words, and a 1 (very native accent) to 9 (very strong foreign accent) for sentences and an extemporaneous narration, listeners rated the accents of speakers. Then, using a program ID choice task, listeners indicated which program the anonymous speakers had completed. Results suggested that French immersion speakers were rated differently and could be distinguished from Core French speakers at above chance levels, though success rates among listeners varied somewhat. Formal analysis demonstrated that longer utterances produced more accurate choices. Self-reports of immersion speakers suggested that they spent a greater amount of time with their immersion peers both inside and outside the school environment than with English program peers, possibly accounting for differences in L2 French accent. Acoustic analysis indicated that French immersion speakers produced some token sounds (ex. /u/) in a measurably different way from Core French speakers.

**Keywords:** French immersion; L2 accent analysis; Institutional accents; Acoustic analysis; L2 accent perception; Exploratory research

## **Dedication**

I dedicate this work to my parents Agi and Geza, and to my grandparents.

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## List of Acronyms

CF	Core French
EI	Early (French) Immersion
F1, F2...	Formant 1, Formant 2...
FI	French Immersion
FSL	French as a Second Language
LI	Late (French) Immersion
PC	Programme Cadre
S1	Sentence 1
S4	Sentence 4
S7	Sentence 7
VOT	Voice Onset Time

# Chapter 1.

## INTRODUCTION

Canada's French immersion program is a reflection of its history as a bilingual country. This program has been both praised and criticized by the public and researched by linguists since it was first launched in the early 1970s. Though many facets of this program have been explored, especially in Canada, there is one topic that to my knowledge has been rarely examined (Netelenbos, 2013): the French pronunciation of immersion students. While the speaking capabilities (i.e. grammar and lexicon) of immersion students have been compared to both speakers who have taken traditional FSL programs (known as Core French In BC), and to native speakers, no study has focused on immersion accents.

The principal theme of this research is based on the existing French immersion program in Canada (specifically on the one found in the Anglophone province of British Columbia) and on the perception of foreign accents. The goal of this study is to determine if it is possible to identify an accent that is unique and solely associated with the French immersion program in British Columbia. As this is an experimental study, the research proposes to answer three key questions regarding strength of accent, ability to distinguish between immersion and other French programs by accent alone, and the phonetic components of the "Immersion Accent", providing that one can be identified.

My ultimate goal is to advance existing research on French immersion and introduce this French "Immersionese" as a topic for future research in order to contribute to the research on the immersion program in Canada. The study

focuses on the French immersion programs in the primarily Anglophone province of BC.

## **Chapter 2.**

### **LITERATURE REVIEW**

#### **2.1. French Immersion in British Columbia**

The French immersion program is one of the many educational programs offered by public schools throughout Canada. While it may be young (1965), it has had a significant impact on the country. Given that the goal of this research is to identify whether an accent can be uniquely associated with the French immersion program, it is necessary to first identify the program's unique characteristics. Section 2.1.1 is first dedicated to discussing the history of the program along with the political factors that led to its creation. Then, the clientele of the program and its teachers will be examined. Lastly, the section will explore the reasons for the program's popularity.

##### **2.1.1. Start of French Immersion**

Canada has had a bicultural nature since the end of the Seven Year's War, which well preceded the establishment of the French immersion program. There were many debates on this nature and its impact on Canadian culture in the 1960s. Specifically, the concept of whether Canada should have one or two official languages was hotly debated. These debates culminated with the Royal Commission on Bilingualism and Biculturalism (1963). The Commission proposed to make Canada an officially bilingual country – at least federally (Fraser, 2011). It was during this period – in 1965 – that the French immersion program was born in the small Quebec suburb of St Lambert.



The immersion program was co-founded by a group of Anglophone parents living in St. Lambert and two University professors of linguistics and psychology. The parents believed that their children would have better work opportunities and social lives if they could speak French, because the vast majority of people in Quebec were monolingual (French) or bilingual (French-English) (Fraser, 2011). According to the linguist Genesee, “These parents felt that their lack of competence in French contributed to, and indeed was attributed in part to, the two solitudes which effectively prevented them from learning French informally from their French-speaking neighbours. Their inability to communicate in French, they felt, was also attributable to inadequate methods of second-language instruction in the English school” (Genesee, 1987, p.9).

The two professors involved in the creation of French immersion were Lambert of McGill University and Penfield of the Neurological Institute of Montreal. The program was based on Lambert’s suggestion that being schooled in the language *not* spoken at home was the best way to become bilingual (Lapkin et al. 1983, p. 3). The program was therefore intended to create an environment in which all the teachers and all the students spoke French amongst themselves, and all the students would begin their education with no knowledge of the French language. It was believed that this would enable the learners to acquire French “much as one had learned one’s mother tongue : first by simply learning to communicate with others, and then by using one’s new language skills to find out about a variety of different subjects.” (Lapkin, p. 4).

The program aimed to teach students to speak French and become bilingual. Furthermore, it was open to all students and has risen in popularity every year. However, recently there has been some criticism of the program’s claim that it produces bilingual students, which could have a number of impacts, including an effect on future student populations who enrol in the program. These claims are important to this research, as accents can also be important indicator

of L2 learners' proficiency. The following section will analyse the structure of the program as well as what has made it so popular.

### 2.1.2. Structure and Students of the Program

There were three possible ways to enter the French immersion program during its first decade: Early immersion, Intermediate immersion and Late immersion. Early immersion began from Kindergarten or Grade 1, Intermediate from Grade 4 or 5 and Late immersion began from Grades 6 or 7 (the last years of elementary school) (Lapkin et al. 1983). Only Early immersion and Late immersion are relevant to this study, as they are the only two entry points in British Columbia today.

According to the BC Ministry of Education's website, the type of classes taught in French in the immersion program is determined by the school districts in general. However, the percentage of classes taught in French seems to be quite uniform throughout the school districts. The following table shows these suggested percentages for both the elementary and high school French immersion program.

**Table 2.1. Percentage of Classes taught in French in the French Immersion Program<sup>1</sup>**

Grade	% Of French Instruction	% Of English Instruction
K-(2 or 3)	100	0
(3 or) 4-7	80	20
8-10	50-75	25-50
11-12	No less than 25	No more than 75

<sup>1</sup>Note. Table 2.1 better pertains to students finishing Early immersion

The BC Education Ministry further explains that although Late immersion students usually begin their program much later than Early immersion students, they are still expected to obtain a high degree of French proficiency. The Ministry recommends that the entirety of Late immersion students' first year be taught in

French, and that the total number of courses taught in English in their second year should not exceed 20% of the total instruction time.

According to CPF<sup>1</sup> (2013), about 46,900 students (8.1% of the student population of British-Columbia) are enrolled in French immersion and this percentage has grown constantly each year for the past 14 years. In 2011, Stats Canada (2013), and Friesen (2013) reported that there were between 340,000 and 341,000 students in French immersion throughout Canada, and interest in the program increased by 28% between 1991 and 2011 (2013).

Furthermore, it is estimated that 40 of 60 school districts in British Columbia have French immersion programs (Pemberton, *Vancouver Sun* 2013). However, it appears that the growth rate of the program cannot keep up with public demand for it. In a 2013 April *Vancouver Sun* article, Pemberton indicated that the demand for the program is “outstripping capacity in many B.C. communities” especially in remote areas, and a CPF (2012) report claimed that the selection process for students has been unfair. Moreover, the popularity of the program appears to have consequences for its student population. The following section will examine the reasons why French immersion is so popular, and at times, controversial.

### **2.1.3. Popularity of French Immersion**

Research conducted by Statistics Canada in 2008 showed that three out of every five French immersion students were female –except in Quebec. Furthermore, the majority of students in the program were from families with high socio-economic backgrounds. The fact that French immersion attracts a large

<sup>1</sup> Canadian Parents for French is a not-for-profit organisation that supports the French immersion program across British Columbia and the whole of Canada

number of students in the same socio-economic category suggests that it may have created an elite sector within the Public Education system (StatsCan 2008).

In addition, Hart and Lapkin (1998) had previously found that approximately 65% of French immersion students from a Toronto school district were from the upper-middle class (at the time the report was written). In contrast, Mougeon, Nadasdi and Rehner (2010) found that in Ontario, slightly over half of the students (51%) came from middle class backgrounds, while 37% of students were from upper-middle class families. On the other hand, Hart and Lapkin (1998) found that less than 20% of students in the English language program within the same school district belonged to the upper-middle class. Although it is important to acknowledge that a high percentage of Early French immersion students are from middle and upper-middle class homes, it is also true that Late French immersion has been much more successful at attracting students from lower socio-economic backgrounds (Mougeon et al. 2010).

Nevertheless, studies have shown that although the number of immigrant students enrolled in French immersion is small, this does not mean that they do not have an interest in the program. CPF (2010) conducted a survey of 154 students and parents. Of those surveyed, roughly 40% of the parents had placed their children into the French immersion program. Fifty percent of parents stated that they would have put their children in the program had they been previously informed of its existence. Lack of information was the greatest reason why immigrant parents had not placed their children into the French immersion program. The survey further showed that 80% of the sampled population had not received any information from schools about the French immersion program, 33% of students had been discouraged by the school from entering the program, and 42% had been rejected

Furthermore, immigrant students and so-called “at risk” students participating in the immersion program had achieved academic results that were

on par with students coming from more affluent families (Mougeon et al 2010). In addition, socioeconomic status did not play a decisive role in French immersion enrolment trends in four provinces (Quebec, Manitoba, Saskatchewan and British Columbia) (StatsCan., 2008). Essentially, immigrant students' enrolment in French immersion was comparable to their enrolment in regular English programs.

Studies on French immersion conducted in Alberta in 2003 and in 2004 by the Public Services Commission of Canada found that the vast majority (76.6%) of the 540 students who participated in the study obtained a grade of B or better for their oral, writing and reading French levels. These participants included students from immigrant families. The language exam results of students from immigrant families were comparable with those of their Anglophone counterparts (Lazaruk, 2007). The Alberta results correspond to 1990 Swain, Lapkin, Rowen, & Hart (1990), who compared 200 immigrants in the 8th Grade, who had begun their French education in the fifth grade (Intermediate immersion program), to their L1 English peers. The results showed that immigrant students fared just as well and at times outperformed their Anglophone peers in French reading, writing and speaking. It appears then, that actual linguistic inability is not holding immigrant students back from entering French immersion. Rather, a belief by some that French immersion is only for those who have already mastered English may be one of the reasons why less students from immigrant families enrol in the program (CPF, 2010). Lack of information appears to be the primary reason for the low enrolment rate of immigrant students in the Program (CPF, 2010).

Despite the evidence presented above, some articles in the media have French immersion in a somewhat negative light. For instance, Globe and Mail columnist Margaret Wente (2011) suggests that "The main allure of French immersion is that it provides all the benefits of a private school without the tuition costs (or so parents hope). They've heard about those brain-science studies that

say bilingualism confers important cognitive benefits.” These studies began in the 1960s. Prior to this period, the effects of bilingualism were considered to be either negative or neutral. This changed when more comprehensive studies began showing opposite effects. For example, Peal and Lambert (1962) found that “bilingual children demonstrated more mental flexibility... and a more diversified intelligence than monolingual children do” when they engaged in innovative thinking (p.21). Baker (2000) asked vague questions (“How many uses can you think of for a brick?”) in a study on the cognitive capacities of bilingual individuals, and reported that bilingual individuals a much wider variety of responses than monolingual individuals. Baker (2000)’s bilingual participants were also more flexible and original in their responses. He attributed this heightened “elasticity in thinking” to bilingual individuals’ access to two or more words for one idea or object.

Another criticism of French immersion pertains to the argument that the program does not in fact create “real bilinguals”. A study by Tatto in 1983 compared nine grammatical errors and lexical errors made by French immersion students to Core French students. Some of the identified errors were orthographical, syntactical, and incorrect noun markers. The findings suggest that French immersion students fared better than Core French students in many categories (except noun marker errors), while native French speakers (who were used as the control group) made fewer mistakes than French immersion students (Tatto, 1983). While the purpose of this study, as mentioned by Tatto, was merely to isolate and identify the errors, and not to examine their underlying causes, it still presents a key assertion: even though French immersion students have studied French for many years, they still make more mistakes than native French speakers.

Studies by Nadasdi, Mougeon and Rehner (1999, 2004) have also looked at language acquisition among French immersion students. By comparing French immersion students in Toronto to native French speaking students in Quebec,

the researchers aimed to find if immersion students could use – or had knowledge of – the “same range of sociolinguistic variants as do native speakers of Quebec French” (Nadasdi et al. 2004, p. 412). Both studies observed that while some linguistic variables were mastered by immersion students, their overall sociolinguistic competence of immersion learners was “considerably below that of native speakers of Quebec French”, despite the many years they had spent mastering the language (Nadasdi et al. 2004). Uritescu et al. (2002) also found that, when compared to franco-ontariens, Ontario French immersion students were less likely to erase the French schwa (often seen in informal speech). This is interesting both in terms of phonetics and sociolinguistics for two reasons: (1) immersion students are less likely to use amalgamations such as j’suis [jy] and therefore, (2) they are more likely to employ formal speech, taught in school, when using colloquial French.

These studies did not directly question the bilingual status of French immersion students, but other researchers have done just that. Hammerly (1989) attempted to show that it was simply not possible for the program to foster bilingualism, as he understood the concept, given the teaching methods that are used. He explained that the program does not create “real bilingualism” because students make too many grammatical errors in their speech and because French immersion was founded on “fundamentally incorrect assumptions... that French language can be acquired well in the classroom by communicating, the way young children acquire their native language.” (p. 110). According to Hammerly (1989), the only manner in which one could truly acquire a native-like command of French is to be “surrounded by native Francophones a good many of one’s waking hours from about age 2 to age 4 or 5”.

Despite Hammerly’s assessment of the French immersion program’s failings, Genesee (1978)’s early analyses of the success of the program showed that immersion students outperformed traditional FSL program students and

performed equally well as their native speaker peers in nearly all academically gradable aspects of language. Immersion students only scored worse than their native student peers in areas that were not traditionally graded, such as pronunciation (Genesee, 1978). The Alberta studies (Lazaruk, 2007) discussed above showed that French immersion students' scores for speaking, reading and writing in French were sufficient for them to be hired for most bilingual positions in the federal public service sector. Another objection to Hammerly is that the term bilingualism does not have a universally accepted definition, so Hammerly's understanding of the term is not the only one. Other researchers claim that there are two types of bilingualism (Abdelilah-Bauer, 2008). The first and previously mentioned term of early bilingualism refers to those who have acquired a second language before the age of 6, while the second definition (late bilingualism) refers to individuals who have acquired a second language after that age (Abdelilah-Bauer, 2008). With respect to this research, French immersion students may fit into the second category, although that is dependent mainly on the type of French immersion they were first exposed to (either Early or Late).

Wente (2011) provides another criticism of French immersion in claiming that its success is not due to it being a superior educational program, but rather, to the fact that the students in the immersion program already have an advantage over their English program peers. In her article, Wente comments on this by saying that, "Parents who are ambitious for their children use French immersion as a form of streaming. Their kids do very well in school – not because they're learning French, but because they'd do well anywhere. These are the same kids who started out in Montessori school. Their parents know that peer groups matter and that French-immersion classes are full of other bright, accomplished children" (meaning academically accomplished). Wente adds that parents do not even place their children in the program because they believe that bilingualism is important or beneficial for their children. Rather, parents aim to



place their children in a homogeneous group of other students who are just as advanced as their children.

However, counterevidence to Wente's assertions refutes the claim that French immersion students are more academically accomplished than their English-program peers because the students and their families have a socio-economic advantage over English program students and their families. For example, Genesse (2007) showed that students with academic and language learning difficulties were not more likely to be at risk of poor performance in French Immersion and could "acquire substantial communicative competence in French while maintaining parity in their academic and language development with similarly challenged students in all-English programs". This leads back to Peal & Lambert (1962)'s finding that it is bilingualism itself that gives students cognitive benefits. It would thus be acceptable to surmise that the benefits of bilingualism pertain to most types of learners (at-risk or otherwise).

#### **2.1.4. Conclusions about French Immersion**

Despite the aforementioned criticisms, a more positive outlook on bilingualism and the bilingual program has made French immersion very popular among students from all social and ethnic groups in British Columbia. Although these students have many differences, they do have some important traits in common: the majority of the students are all L2 learners of French, are always isolated from their English program peers for many of their courses, and most often do not live in provinces where French is the dominant language. Because of this isolation, it could be possible that the students develop distinct grammatical, syntactic (Tatto, 1983; Mougéon et al, 2004) and even phonological traits that distinguish them from both their English program peers and francophone peers. The next step will be to see what sort of accent can be associated with French immersion. In section 2.2, this will be achieved by defining dialects, foreign accents and so called "Institutional Accents".

## **2.2. Defining “Accents”**

Typically, an accent is associated with the sounds found in a particular variety of speech (known as segmentals), as well as with the melody of the language (known as prosody). This section has been narrowed down to three potential definitions of the term accent: those associated with dialects, those associated with foreign accents, and those associated with institutional accents. The research recognises the many competing definitions associated with the concepts of accents and section 2.2 explores the definitions most relevant to French immersion.

### **2.2.1. A case for dialects**

Because the French immersion program isolates students from English peers for most of their elementary and some of their high school years, it is possible that the students would learn French not only from their teachers, but also from each other. If this is true, the resulting dialogue may be a sort of “immersionese”, as was proposed early on, by Lyster (1987). According to the most basic definition found in Crystal (2008)’s linguistic dictionary, a dialect is defined as “A regionally or socially distinctive variety of a language identified by a particular set of words and grammatical structures. Spoken dialects are usually also associated with a distinctive pronunciation or accent” (p. 142).

While the present study remains solely concerned with the phonetics of an accent, the above interpretation does have some ramifications in regards to the case of French immersion. Although the French immersion program is not linked to one particular regional area, as often the case with dialects, there is evidence that suggests that students engage in group behaviour in the program (Courcy, 2004). Groups often use language as a marker of group membership (Labov, 1978). Therefore, it would be possible to assume that the “accent” or manner of speaking of the students in the program could refer to a sociolect.

Due to French immersion students being more or less isolated from their English program peers, it could be theoretically possible to refer to a potential French immersion accent as a dialect. However, for the purposes of this study, the above definition of dialect is insufficient. Often, a dialect, be it regional or social, is a variation of a speaker's L1. This is not the case with French immersion students.

### **2.2.2. Defining foreign accents, and their relevance to French Immersion**

As has been suggested, French immersion is designed for Anglophones (or allophones) living in regions where the French language is a minority language. It is therefore possible that any accent that most students develop would be through L1 transfer (often English) to the L2 French. This kind of accent does not fully conform to what is being explored in this study – that the French immersion accent is unique to the program and therefore goes beyond being a transfer of English sounds to French sounds. Nonetheless, it is necessary to define the term “foreign accent” in order to see if it applies to the case of French immersion here.

For Munro (1998), a foreign accent is defined as “non-pathological speech produced by second language learners that differs in partially systematic ways from the speech characteristics of native speakers of a given dialect” (p.135). A foreign accent is also defined as a some perceivable pronunciation patterns that can be used to identify members of different speech communities (Munro, Derwing & Flege, 1999). Taking a more sociolinguistic perspective, Lippi-Green (1994) explains that a foreign accent consists of “sets of distinctive differences over geographic or social space, most usually phonological and intonation features. In the case of second language learning, accent may refer to the carryover of native language phonology and intonation into a target language” (p. 165).

Furthermore, in terms of perception of foreign accents, Flege (1995) stated that the “listeners hear foreign accents when they detect divergences from English phonetic norms along a wide range of segmental and suprasegmental (ie. prosodic) dimensions” p. 233). Therefore, according to Flege et al. (1995), accents (foreign or regional) can be perceived by listeners. Whether or not the hypothesized French “immersionese” qualifies as an L2 foreign accent remains to be seen.

The factors that may affect the degree of that accent are another important consideration. Piske, MacKay and Flege (2001) identified a set number of factors that affect L2 accents: age of L2 learning (AOL), length of residence in a country/region where the L2 is widely spoken, gender, formal instruction, motivation (to acquire a native-like accent), language learning aptitude, amount of L1 use, and amount of L2 use. Out of these factors, only a select few have proven to have predictive power with respect to degrees of L2 accents: AOL, formal instruction, motivation, length of residence and amount of L2 use. The age at which the students start learning L2 French is important, but may not be a relevant factor in this study, as Early French immersion students in British Columbia all start from Kindergarten (age 5). Core French students usually start French in grade 4 and Programme Cadre students also start in Kindergarten. The latter group’s accent would in theory be categorized as native or native-like, as the francophone schools are intended for native speakers of French. Amount of L2 use and formal instruction would also be the same for all Early French immersion students from British Columbia, and the only differing point in the three programs would be the quantity of French students are exposed to. Measuring motivation, on the other hand, can prove difficult because the notion is affected by “several intervening variables” (Gardner & Tremblay, 1994:366) and more research is required to determine if it plays a part in improving accents among L2 learners (Moyer, 2004). As it has been mentioned above, the target

population of Early French immersion is very young; therefore, it is likely that their parents would be the ones deciding what program their children will attend.

As mentioned, another factor affecting degree of foreign accents is length of residency. This typically assumes that the individual has, at some point, changed residence to an area where their L2 language is the dominant form of communication. However, this cannot apply to French immersion. Effectively, the program presents a unique case in which students of various social, regional and ethnic groups can come together and learn to speak with the same non-native accent. The “foreign accent” definition is valuable to the research to an extent, but it is still necessary to add one more crucial element that will help to fully define the “French immersion” accent. Given that the students learning L2 French in French immersion schools are in an otherwise Anglophone environment, it is therefore important to examine how an accent can form in an institution.

### **2.2.3. “Institutional Accents” and French Immersion**

Because French immersion students learn French in provinces where French is not the dominant language and spend a fixed amount of time each day learning French, it is necessary to add a component to this literature review that has been missing until now. That is, the types of accents discussed above have been “naturally occurring accents” that come from specific regions or are influenced by a first or dominant language. An underlying assumption of French immersion is that it is in fact possible to recreate natural language-acquisition conditions in the classroom so that students will unconsciously learn a language (Hammerly, 1989). However, as we have seen, French immersion does not represent an actual natural setting, nor does it appear to be able to mimic one. It is proposed here that the setting is institutional in nature, and any accents students may have developed would therefore be institution-based.

The best documented case of an Institutionalized language is the English “boarding school accent”, called “Received Pronunciation”. This accent has been carefully cultivated and propagated by the heads of Public schools<sup>2</sup> in the UK. Spencer (1957) described this accent as:

“a form of pronunciation of English which within England cannot be regionally delimited, although it is regional in the sense that England is a region of the English-speaking world. It is an accent used by a minority of English people, who appear to be confined to a class, or group, within English society, rather than to a region. The accent has been variously and ambiguously termed by linguists. There is also no generally accepted lay term for this accent, and it is not easy to explain to a layman exactly what is meant. It has now become customary for phoneticians and linguists in Britain to refer to this accent as Received Pronunciation (abbreviated to RP), a phrase in which the word “received” has the now generally obsolete meaning of “socially acceptable.” (p.17)

Jones (1960) suggested that this accent is “generally used by those who have been educated at ‘preparatory’ boarding schools and the ‘Public Schools’” (p. 12). Abercrombie (1956) has commented on the fact that the non-regional character of this accent comes from English public schools and is maintained by these schools. The principal goal of the schools is for all the students to develop a uniform standard English accent that would replace whatever regional accent students they had developed at home (Jones, 1937; Spencer 1957).

However, the conditions for Received Pronunciation (RP) do not apply to French immersion. RP standardizes the English language when English is the students’ mother tongue. Students in French immersion find themselves in practically the opposite situation. They are students to whom French is the second, third or fourth language and therefore the “foreign language” aspect seems to be missing from the Institutional definition. Cox (1998)’s article “Vers une norme pour un cours de phonétique français au Canada” suggested that to create a Canadian French standard, the type of French used by the broadcasters

<sup>2</sup> In the case of England, Public School refers to the private school system.

of Radio Canada should be taught to students. The French spoken by Radio-Canada broadcasters is not only a sort of fabricated language (as it is an artificially chosen amalgamation of many regional styles of French found throughout Canada), but should perhaps be the standard used in schools where French is taught as a second language (Cox, 1998).

Cox's definition of accent provides evidence for there being a unique French immersion accent. Further evidence is provided by a longitudinal study from 2011 by Orr, who examines a unique L2 English accent found at University Collage Utrecht. Orr (2011) reported that although Dutch is the primary language in Utrecht, the university's student population speaks more than 40 different native languages and less than 5% of the students are native speakers of English. Orr explains that because of this linguistic diversity, English has become the defacto lingua franca for "academic and social interaction" (Orr, 2011), meaning that an L2 language is the main means of communication. Orr observed that throughout the three-year duration of the study, non-native speakers' different accents mixed to form a homogenous accent that is recognized as a UCU accent by other academic institutions where UCU students would attend graduate studies. This accent was cultivated by the closed-off nature of the university, and was neither Standard English, nor an L2 accent that is strictly influenced by speakers' native languages.

The research described above is exceptionally relevant to this study since students finishing French immersion have spent most of their academic lives with other French immersion students, especially their elementary years, and do not graduate speaking with, what is characterized as, the "Standard French Accent". While how much French is used socially by French immersion students is not known, it is certain that nearly all courses are taught in French in elementary school and many courses are also taught in French in high school.

Furthermore, a very recent study on the voiceless and voiced stops of elementary school French immersion students by Netelenbos (2013) found that the VOT for the target /p,t,k/ and /b,d,g/ did not change as students became more proficient in French. It was also found that students' VOT for the /g/ was significantly longer for one of the classes than for other classes examined. Netelenbos (2013) surmised that this may have been due to the close-knit nature of the program.

### **2.3. Group Behaviour and Language**

The structure of the French immersion program was discussed in the first part of this literary analysis, and types of foreign accents were discussed in the second part. Section 3 will discuss how language can affect a group (whether it be a national, ethnic or social group), and conversely, how a group can affect a language.

Unfortunately, there do not seem to be any concrete statistics about the nationality or socioeconomic standing of the entire student population in the French immersion program in British Columbia. This lack of information is problematic because French immersion students do not belong to a pre-existing group. As was mentioned, the goal of this research is to determine whether or not it is possible to identify an accent that is unique to the French immersion program. In order for that to happen, it is expected that there is a certain cohesion between students in the program – that the students are engaging in group behaviour. This next section will explain how the feeling of belonging to a group can affect the language of the group in question. It will then provide evidence of group behaviour in the French immersion setting.



### **2.3.1. Language as a Group Identifier**

One of the earliest analyses of language and the role that language plays in group identity can be found in Labov's (1978) "Le parler ordinaire". Analysing the vernacular speech of African Americans in various American ghettos led Labov to conclude that it would be more fruitful to observe the manner in which individuals in the same group conversed with one another rather than to isolate individuals from the group. The principal argument for this was simply that the vernacular was a characteristic of the group, not one individual. In essence, language is a part of a group's culture and thereby tied to the identity of the group (Labov, 1978). This idea is repeated by another social psychologist, Tajfel (1974, 1981), who defined social identity as "that part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the emotional significance attached to that membership". Language is among these identifiers of social identity. Using Tajfel's principal definition, Giles and Johnson (1981, 1987) developed their ethnolinguistic theory, which considered language to be a key factor of group identification. This means that the manner in which one speaks is directly associated with the group or category a person either belongs to or has been stereotyped as belonging to. Heller (1982) further explained that "language is a symbol of ethnic identity, and language choice is a symbol of ethnic relations as well as a means of communication" in which the language used intends to distinguish the "we-code" from the "they-code" (Gumperz 1982).

Other sociolinguistics (Hansen, Liu, 1997; Heller, 1982; Gumperz, 1982) have often restated and reinterpreted Giles' and Johnson (1981, 1987)'s theory to characterise the identifying traits of "macro-communities" (defined here as ethnic groups or minority groups). While the theory is interesting on its own, and certainly open to much debate in the ethnolinguistic field, it does not necessarily meet the requirements of this particular research for a number of reasons. As

was shown in previous studies, factors such as ethnicity do not affect the likelihood of students enrolling in French immersion in BC.

Furthermore, the above idea that language is a source of group identity, pertains to naturally occurring groups who spontaneously group together because of some pre-existing common factors. These factors could be socio-economic, geographic, cultural or even linguistic. It is assumed that the individuals already identify with each other and choose to use language as a further means of distinguishing themselves from those perceived as outside the group. In the case of French immersion, the students are in a non-natural setting and come from various familial, cultural, economic and social backgrounds. They are not necessarily in the program because they pre-identify with the group, nor are they necessarily there because they share a common goal of learning French.

If language truly does identify a group, and the French immersion program does produce a similar manner of speaking among its student population, it is possible that the feeling of being part of a group is either implicit or is formed after the students are put together. Section 2.3.2 explores these possibilities in greater detail and will show that the program does indeed produce a group phenomenon similar to those displayed by larger ethnic or minority groups.

### **2.3.2. Evidence of Group Behaviour among French Immersion Students**

As it was previously explained, the group phenomenon experienced by students in the French immersion program could be the result of their proximity and their being better acquainted with others in the program than with those outside of the program.

Although the program's ultimate goal is for participants to become proficient in French, this does not appear to be the students' sole purpose of

remaining in the program. Table 2.4 from Lewis (1986) showed data collected from a survey about some of the reasons students gave for remaining in French immersion.

**Table 2.2. Motivating factors for remaining in French Immersion (Lewis 1986)**

Reasons for remaining in FI	% Of students who chose this reason
The possibility to learn and use French	76%
Friends, small, close-knit group	19%
Possibility to learn and understand a world culture	15%
To provide a challenge	13%

While the majority of students chose the first option as the most obvious attribute of French immersion, it is the second most popular option (19% of students) that is interesting here. The program characteristically promotes the other three factors, but the second one does not appear to be one of its goals. Nonetheless, it appears to be important to the students.

Furthermore, Courcy (2001) in Australia found that being in a group with the same students seemed to be important to students. In this research, the results of comparing participants in two groups (those learning Chinese through Chinese immersion and those learning French through French immersion) showed that students in the French immersion program were more comfortable with each other than those in the Chinese immersion program. The reason for this was thought to be that the French immersion program students were all at the same or similar levels of French, whilst the students learning Chinese were not all at the same level.

“The response to the group dynamics seems to have been much more positive with the French immersion group. The students commented that they usually spent their lunch breaks with the people in the class, (... ) (a student) noted in her interview that “sometimes we feel left out from the rest of the school” because “they’re always mixing with everyone else’.” On the other hand she liked the security of being in the same group of people for the whole immersion experience. “It’s good in a way because

out class has always been together, so we've all become very good friends and we're always helping each other with it.”(p.62)

This finding is critical for the present research, as it shows that French immersion students are exposed more to one another than to their Anglophone peers. However, further data would be needed to determine the frequency of the exposure.

In terms of group behaviour, the students in the French immersion program had friends in the class (Courcy, 2001), but they did not form smaller groups within the classroom. Courcy (2001) showed that while students liked to sit with their friends, they still deemed it more important to just sit with anybody rather than to sit alone because “Sitting alone led to poorer overall comprehension of what was going on in the class. Students also helped each other with their study outside of class time”. Generally, the class functioned as a group rather than as a set of groups.

These results were similar to results previously found by Courcy (2001) and seem to strongly indicate that “the tight social group that is formed by students in immersion programs needs to be fostered and encouraged... it may be the key to the students’ success in attaining a high proficiency in French.” (p. 69) – which seems to be the general educational goal of the program. As Courcy (2001) suggested, immersion students formed social groups or quasi-social groups of students in which French became the glue that bound them together.

Effectively, the use of French is no longer just fulfilling an educational goal. It has also become a marker of group membership and identity that French immersion students use to separate themselves from their English program counterparts. This is illustrated by Courcy (2001), who stated that “rather than having any particular ‘in-group’ expression the students seem to use regular French as a ‘group’ language. The use of French among themselves may play the role of fostering group cohesiveness and separateness” (p. 67). This points

back to Giles and Johnson's definition (mentioned above in *Language as a Factor of Group Identity*), in which language becomes a distinguishing feature of ethnic and minority groups. This would prevent students from sounding "too English" or conversely, "too French".

However, because Courcy's research was a case study, it would be erroneous to generalise the results from that one study and present them as fact. Further studies would have to be conducted before a generalised assessment could be made with respect to group behaviour in the French immersion setting. However, this research is only using previous studies as theoretical and methodological reference points.

## **2.4. Current Study**

The preceding literature review has shed light on the French immersion program's practices, its student population, its popularity, and on some criticisms of the program's ability to foster bilingualism among students. The review has also presented studies pertaining to L2 learners' accents (French or otherwise). The studies on accents have provided evidence of the necessary preconditions for accents to form. Then the studies on the French immersion program have shown some of its students' perceived linguistic "successes" and "failings" with respect to reading/writing/listening, comprehension, semantics, and morphology. However, studies on French immersion would benefit from further analysis of the phonetic traits exhibited by the students who have completed the program.

The many studies discussed thus far have focused on the program's target populations. These studies (Hart & Lapkins 1998, Mougeon, Nadasdi and Rehner, 2010, Wente, 2013) have found that the Program was most popular among those families with high socioeconomic status, leading researchers to suggest that the program's successes are not necessarily due to its pedagogical

structure, but rather, are due to the fact that the students are more motivated. This claim is rebuffed by other researchers that have suggested that students tend to do well in the French immersion program regardless of their personal abilities (Genesee, 2007; Lazaruk, 2007; Lapkin, Rowen & Hart, 1990; Mougéon, Nadasdi & Rehner, 2010).

Some of these other studies have focused on students' mastery of French grammar and lexicon (Genesee, 1978; Totto, 1983; Rehner et al., 1999; Mougéon et al., 2004, 2010). It has even been suggested that students who have mastered certain aspects of speech in the target L2 still lack the sociolinguistic sophistication of native speakers in Quebec (Mougéon et al., 2004, 2010; Uritescu et al., 2002). Other studies have questioned whether students in the program truly become bilingual due to errors in speech and writing (Hammerly 1989) while some researchers have pointed out that students' linguistic competence does not meet the national prerequisite for most bilingual work positions in the Federal Public Service sector (Lazaruk, 2007, p. 608). Some studies have focused on the French immersion students' behaviour in the classroom environment with respect to language learning strategies (Courcy, 2001). However, most current studies on French immersion have focused on either syntax, lexicon, or the morphological or sociolinguistic variations employed by students. A phonetic analysis of French immersion speech remains to be completed. As of yet, there appear to be relatively few published studies on the accents of students learning L2 French in the French immersion program.

Although some studies have focused on the development of group accents in closed environments, such as a university or a particular school system (i.e. the traditional British public school system) (Orr 2011), these have mostly dealt with either the accent modification of L1 languages (Jones, 1937; Spencer, 1957) or with late L2 acquisition (Orr, 2011). In the case of Early French immersion, students start learning (or arguably, acquiring) their L2 language from an early age (5 years old). Those who complete the program

spend an average of 13 years (counting Kindergarten) in one non-natural linguistic environment. Therefore, it is possible that French immersion students would not have much contact with French outside of the classroom – especially in a non-Francophone environment like British Columbia – nor much opportunity to interact with people in French outside of their own French immersion peer group.

### **2.4.1. Research Questions**

The present study aims to determine if immersion students have a distinct accent. As was mentioned, few studies of French immersion have examined the phonetic properties of students' accents (Netelenbos, 2013; Uritescu et al., 2002) although there has been one notable study on L2 English accents found in a similarly closed-off academic setting (Orr, 2011). This study will employ a methodological approach adapted from previously conducted L2 accent studies in order to probe aspects of immersion pronunciation. It intends to thereby contribute to the large existent body of work on French immersion.

The study aims to answer the following questions.

- How do listeners rate the strength of the French L2 accents of French immersion speakers in comparison with Core French speakers?
- Can L1 French listeners distinguish between French immersion and Core French speakers based on this L2 accent alone?
- What segments, if any, make the French immersion accent different from the Core French accent?

These questions emerged from points mentioned or discussed in other studies on FI and L2 acquisition, such as accent comparisons with other French program students, accent ratings, formant and VOT analysis, and immersion group dynamics (Abdelilah-Bauer, 2008; Birdsong 2004, 2007; Courcy, 2002; Flege, 1995; Genesee, 1978; Munro & Derwing, 1995; Mougeon, Rehner & Nadasdi, 2004; Netelenbos, 2013; Rehner, Mougeon, 1999).

As this study is exploratory, no specific hypothesis will be advanced for testing. The study simply strives to answer these questions in order to provide a starting point for future research on French immersion accent perception. The study acknowledges that further research will be necessary to gain a greater understanding of immersion pronunciation in comparison to other French language school programs.



## **Chapter 3.**

### **METHODOLOGY**

Speech samples of participating French immersion (FI) graduates, attending university at the time of the study, were submitted to perceptual analysis. This objective required the following three procedures. First, two French L1 speakers were used to make the stimulus recordings that research participants would listen to and mimic. Then, participants recorded their voices while performing various speech tasks. Participants (referred to here as speakers) first recorded ten French words and eight distraction words. Next, they recorded sentences in a delayed-repetition sentence-production task. Finally, speakers were provided a picture story, which they used to record an extemporaneous narration based on the images provided. The second phase of the research required a perceptual analysis (performed by L1 French listeners). Listeners were asked to assess the speakers' L2 French pronunciation and to attempt to identify the type of French program each speaker completed in high school, if possible. The third phase required an acoustic analysis, in which the speakers' productions were submitted to voice onset time (VOT) measurements and formant measuring spectrographic analysis. The following sections present the subjects of the experiment, as well as the experimental protocol.

#### **3.1. Speakers**

Speakers participating in this research completed a web-survey regarding their experiences with French. The web-survey also asked questions about the speakers (their age, the program that they finished, whether they had

participated in an exchange in an area where French was spoken as the primary language etc.) in order to identify the similarities and differences among the speakers.

To recruit speakers, the research was presented to first and second-year students attending French courses at Simon Fraser University (SFU). These courses are specifically tailored to students who have completed core French (CF) (for all FREN 121 and FREN 122 courses) and FI or Programme Cadre (PC) (200-level courses). Individuals interested in serving as speakers were asked to submit their email addresses, in order to be contacted later. All interested parties had to sign up on a doodle scheduling document and, in accordance with Simon Fraser University ethics protocols, all speakers were made aware that they had no obligation to participate in the study and could opt out at any time.

All speakers were given a randomly selected 4-digit code to hide their identities. In total 24 speakers (20 female, and 4 male) volunteered for the experiment. Of those, 20 (16 female and 4 male) fit the criteria required for the research according to the results from the web survey. The other 4 were eliminated (due to not having completed the required French programs or because of faults in the recordings). As seen in Table 3.1, the speakers consisted of 6 CF speakers, 7 early immersion (EI) speakers, 4 late immersion (LI) speakers, 2 PC students and 1 intensive French (IF) student. Five were born outside of BC (4 of whom were born outside of the country) and all but 3 students reported proficiency in a second language (Tagalog, Mandarin, and Korean for 15 students, while 1 claimed to have English and French as their native languages.). One claimed to have three native languages: English, Russian and Spanish.

**Table 3.1. Speaker Profile (Web survey Results)**

Program	Speaker Code	Age	Gender	L1	Parent L1
CF	1806	19	M	TA <sup>2</sup>	TA
CF	5844	(N/A <sup>1</sup> )	F	MA	MA
CF	7209	21	F	EN	EN
CF	7716	20	F	EN	EN
CF	8024	19	F	KO	KO
CF	9685	(N/A)	F	EN	EN/GE
EI	1469	19	F	EN	EN/GE
EI	2080	(N/A)	F	EN	EN
EI	2523	19	M	EN	EN
EI	2893	20	F	EN	EN/FR
EI	2981	21	M	EN	EN/HI/FU
EI	8048	22	F	EN	EN/GE/FR
EI	8550	18	F	EN/SP/RU	SP/RU
IF	7328	20	F	EN	EN
LI	1847	23	F	EN	EN
LI	2009	20	F	EN	EN/FR
LI	5481	19	M	EN	EN
LI	9770	23	F	EN	EN
PC	7020	19	F	EN	EN/SP
PC	7262	(N/A)	F	FR/EN	FR

<sup>1</sup> N/A for individuals who did not provide their age.

<sup>2</sup> Abbreviations are as follows (in alphabetical order): EN: English; FR: French; FU: Fujian; GE: German; HI: Hindu; KO: Korean; MA: Mandarin; RU: Russian, SP: Spanish; TA: Tagalog.

When asked to rate their English proficiency on a Likert scale of 1 (least proficient) to 7 (most proficient), nearly all FI speakers rated themselves a 7, except 2 who rated themselves a 5 and a 6. Three of the six CF speakers rated their English language proficiency as 6 and both PC speakers rated their English a 6 as well.

With regard to the languages spoken at home, over half of the speakers had parents who spoke languages other than English. As Table 3.1 above shows, 6 of the speakers had parents who were multilingual (English and another language) and 6 parents did not consider English to be their native language at all.

All EI and LI participants claimed that English was their native language and one speaker identified Spanish, Russian, and English as her native languages. Half of the CF speakers selected English as their native language, half chose another language other than English or French, and of the PC speakers, only 1 claimed French as their native language. Nearly all EI speakers' parents, save 2, were multilingual (English and another language) and only one LI speaker's parents spoke a language other than English. Similarly, over half of the CF speakers' parents were multilingual and three of the five participants' parents had native languages other than English. The high number of multilingual families in this experiment may reflect BC's highly multicultural and multilingual population (StatCan, 2011). No CF speaker self-identified as Francophone and both PC said they considered themselves francophone.

Another important factor was the level of exposure to French dialects other than the Standard French taught in schools, as can be seen in Table 3.2.

**Table 3.2. Self-Rated Speakers Amount of Exposure to Other Dialects of French in and out of French Programs<sup>1</sup>**

French Program	Level of exposure in schools	Level of exposure outside of school
EI	Between 3-7	Between 1-5
LI	Between 2-6	Between 1-5
CF	Between 1-4	Between 1-3
IF	2	2

PC

5 and 7

4 and 7

<sup>1</sup>Speakers rated exposure to other French dialects on a scale of 1 (no exposure) to 7 (very exposed)

As demonstrated by Table 3.2, the results were mixed. However, in most cases, FI speakers rated themselves as having more exposure to other dialects than CF speakers, and PC speakers rated themselves as being the most exposed. Speakers were also asked to rate their usage of French outside of the school environment because it is possible that if an accent were to have developed in the FI program, it would be due to its isolation from naturally occurring French accents.

All speakers were asked if they had spent any time in a Francophone environment for an extended period of time. A recent study by Derwing and Munro (2013) on Russian immigrants showed that the longer participants lived in their L2 English environment while interacting with L1 English speakers, the more comprehensible they were rated by L1 English listeners. In this study, most speakers (13) had not spent time in an L1 French province or country, so interaction with L1 French speakers was less likely for them. For those speakers who said they did spend time in a francophone environment (6), the interaction time would always have been less than 6 months and how much interaction they had with native French speakers was unknown. Only 1 speaker spent a year in France before attending university.

When asked to rate their own French proficiency on a scale of 1 (least) to 7 (most), four of the 6 CF speakers rated their French proficiency 4 out of 7, and the other two CF speakers rated themselves a 2 and a 3. Half of the EI speakers rated their French proficiency as a 5 and two rated it a 6, with the lowest ratings being a 4 and a 3. LI speakers rated themselves as either a 4 or a 5. For a full list of the questions asked during the web survey, see APPENDIX A.

In general, when directly asked in the web survey, most speakers claimed that French pronunciation was important to them. However, when asked what part of their French speaking abilities they could improve, most speakers wanted to improve their vocabulary or their grammar. Only one speaker (EI) showed an interest in improving their pronunciation.

### 3.2. Listeners

The next part of the research was a perceptual analysis, as mentioned in 3.1. The seven listeners (six female and one male) involved in this research were all university French professors or lecturers at Simon Fraser University’s French Department. Again, the listeners were asked to fill out a brief web survey after they completed their tasks and received a randomly selected three-digit code preceded by the letter *j* for “judge” (ex: j111). All seven listeners completed the survey, leading to the following results:

**Table 3.3. Listeners’ Background Information**

<b>Listener Code</b>	<b>Age</b>	<b>Place Of Birth</b>	<b>Native Language</b>	<b>Other Places Of Residence</b>
j987	60	(Unknown), France	French	(UK)
j729	43	Troyes, France	French	London (UK)
j121	43	Paris, France	French	London (UK)
j903	42	Quimperle, France	French, Breton	Prague (CZ)
j221	54	Mostagamen, Algeria	French	Italy
j678	59	Quebec City, Canada	French	Trois-Rivières (CA)
j871	36	(Unknown), France	French	Canada

Listeners were between the ages of 42 and 60, and all were born in primarily French-speaking environments outside of BC. Only one was born in Canada, as seen in table 3.4 above. The table also illustrates that five of the six listeners had lived in non-French speaking countries or provinces outside of BC for a time, and only one listener claimed to have more than one native language. When asked to rate their English proficiency on a scale of 1 (least) to 7 (most),

two rated themselves a 7, two a 5 and one a 4. One listener chose not to answer. All listeners rated their French proficiency a full 7 (most proficient). All claimed to be at least somewhat familiar with the French programs offered in BC. Three rated their knowledge a 4 out of 5, two rated their knowledge a 5 out of 5, and one rated his/her knowledge a 3 out of 5.

The listeners had between 14 and 35 years of French teaching experience, but when asked about the importance of pronunciation for French proficiency, the results were not uniform: only 2 listeners rated pronunciation a 7 (very important) while the rest rated it as either a 4 or a 5. When queried about their impressions of FI students' accents, four of the six replied that they thought FI students have similar accents to each other, but not to other French program students, and two listeners expected that FI students would sound similar to PC students.

For all three tasks, listeners were told to accept any non-foreign accented dialects of French as native. This was done in order to prevent certain accents from being favored as more native (i.e. standard European French vs. Canadian French accents such as Montreal French or Acadian should one or more of these accents be heard by the listeners). Furthermore, as the images were the same for everyone, it was expected that there would be some lexical overlap between speakers. This could then be used to again, look at the speakers' accents.

### **3.3. Speaker recordings and Listener Ratings tasks**

The experiment involved two main phases: speaker recordings and listener ratings. Speakers were assigned two delayed repetition tasks (as used by Piske et al., 2001 and Yeni-Komshian et al., 2000) and one extemporaneous speaking task (as used by Elliott 1995 and Munro et al. 1999). There do not appear to be any studies that clearly indicate whether one of these approaches

to recording is more effective than the other for evaluating the pronunciation of a speaker (Jesney, 2004). For this reason, both delayed repetition tasks and extemporaneous speech were used to evaluate speakers' L2 or L1 accents.

The first task was a delayed word repetition exercise in which ten words were selected, each highlighting a particular “problem” sound for Anglophone learners of French (Boursin et al. 2010; Birdsong, 2004). According to *La phonétique par les textes*, a learners' manual designed to isolate ‘problematic’ French sounds, there are 21 sounds that may be difficult for English L1 speakers to acquire. It is noted, however, that as this is a textbook and not a collection of research studies on French L2 sounds, the information it provided was used only as a guide to select stimuli for the speakers. A similar experiment on late French learners, where learners began learning French after the highly debated Critical Period (Lenneberg, 1967) was conducted by Birdsong (2004), using a similar word repetition exercise. A study of late Dutch learners of English seemed to show that it was possible to attain native or near-native accents of an L2 language after the age of 18, Birdsong worked with late English learners of French living in France and found that native-like accents could again be attained after age 18. His procedure emulated the methods of previous studies in which native speakers of a language rated the nativeness of the recorded accents of late learners of French L2 (Bongaerts, Planken & Schils, 1995, Oyama, 1976).

### **3.3.1. Choice of word stimuli**

The ten words chosen (Table 3.4) for analysis, along with eight distraction words, were taken from Birdsong (2004)'s study on late learners of French, and these words were used to test the FI speakers who participated in this research, along with 8 distraction words. The word *bureau* (/byʁo/) was added to provide a sample of the French /y/ sound that appeared to be missing from Birdsong's list, despite the fact that this sound differs greatly from the English high back /u/ sound and was referenced in Boursin's text as a difficult sound for L1 English



speakers to master. However, other studies have found the French /y/ to be easily mastered by English learners of French and that mastery depends on the nature of exposure (Brière, 1966; Flege, 1987). Given these opposing views of the difficulty of some French sounds versus others, it was favorable to have as many sounds as possible in order to provide sufficient stimuli for the speakers (as shown in Table 3.4). Furthermore, to avoid having too many additional variables, all the words chosen were masculine nouns (like in Birdsong (2004)'s study).

**Table 3.4. Delayed-repetition word task items**

Words	Transcription	Sounds	Distractor Words	Transcription
bureau	/byʁo/	/y/	corps	/kɔʁ/
chateau	/ʃato/	/a/	grincement	/grɛ̃smã/ OR /grɛ̃səmã/
compliment	/kɔ̃plimã/	/ã/	metal	/metal/
coup	/ku/	/u/	monde	/mɔ̃d/
lundi	/lɛ̃di/ or /lœ̃di/	/ɛ̃/ or /œ̃/	mouton	/mutɔ̃/
pain	/pɛ̃/	/ɛ̃/	parti	/partɪ/
père	/pɛʀ/	/ɛ/	policier	/pɔlisje/
pré	/pre/	/ʀ/	voyage	/vwajaʒ/
temps	/tã/	/t/		
tombeau	/tɔmbo/	/o/		

The speakers were presented with the stimuli in both written and oral form. In order to avoid having speakers directly mimic the voices heard on the recordings, the words were presented in a spoken sentence, and the speakers were asked to repeat the words in another selected sentence. The pattern was always the same: the recording would say: *il dit (word)*, and the repeated sentence would always be *puis je dis (word)*. For example: Il dit le PRÉ, puis je dis le PRÉ. Most speakers were quickly able to respond correctly, but some simply repeated the original sentence (*il dit le pré*). When this happened, the speakers were asked to repeat the words again, this time using the correct form. Later, the key words were extracted from the sentences and normalized for peak

intensity using Praat for the future rating task (Boersma & Weenink, 2014). Audio files were recorded at 44.1KHz sampling rates with a 16-bit resolution.

### 3.3.2. Choice of sentence stimuli

During the evaluation phase of the research, listeners were asked to rate the nativeness of the focus sounds seen in Table 3.6 for the words *bureau*, *temps*, and *lundi*. The word *pré* from five randomly selected speakers was used to warm up the listeners and to get them used to the Praat Playback Program. The ratings for this practice exercise were not recorded.

The next part of the research dealt with the delayed sentence repetition task, which worked much the same way as the above delayed-word repetition tasks. Speakers would hear a question (i.e.: *Quelle heure est-il?*), then the answer to the question (i.e. *Il est 22 heures*), and then the question again. Upon hearing the question a second time, speakers were told to repeat the answer that they had heard (Flege, Munro & MacKay, 1995). Once again, not directly repeating a sentence they had just heard made it more likely for speakers to produce the utterances in their own accents and less likely to directly mimic the accents they had heard on the tape. As speakers were repeating the answers they had heard, the only variable between speakers should have been their pronunciation of the sentences. Once again, the computer screen in front of the speakers alternated between red (listen) and green (speak). There were a total of 8 sentences. Seven of these were to be analyzed and one was used as a distraction sentence. All 10 words from the word repetition task were used in the answer portion of the sentence repetition task (see Table 3.5). This would allow for the analysis of the accents of the words when they were isolated and when they were pronounced as part of a longer unit of speech. Once again, only three sentences were used for the listener evaluations.

**Table 3.5. Delayed-repetition sentence task stimuli<sup>2,3</sup>**

Repeated Sentence	Transcription	Analyzed/Distracted	Rated By Judges?
Il y a un <u>tombeau</u> <sup>1</sup> au milieu du <u>pré</u> /	/ilja ɛ̃ tɔ̃bo o miljø dy pʁe/	Analysed	Yes
Je cherche le <u>château</u> .	/ʒə ʃɛʁʃ lə ʃato/	Analysed	No
<u>Lundi</u> , si j'ai le <u>temps</u> /	/lɛ̃di <sup>2</sup> si ʒe lə tã/	Analysed	Yes
Je vais faire un <u>voyage</u> , je veux voir le <u>monde</u>	/ʒə ve fɛʁ ɛ̃ voʒaʒ ʒə vø vwar lə mɔ̃d/	Distracted	No
J'ai laissé les documents à mon <u>bureau</u>	/ʒe læse le dɔkymã a mɔ̃ byʁo/	Analysed	Yes
Pas nécessaire, mon <u>père</u> a acheté le <u>pain</u> .	/pa neseseʁ mɔ̃ pɛʁ a aʃɛte lə pɛ̃/	Analysed	No
Allez, reste boire un <u>coup</u> !	/ale ʁɛst bwar ɛ̃ ku/	Analysed	No
Oui, elle a reçu beaucoup de <u>compliments</u> de ses profs!	/wi ɛl a ʁɛsy boku də kɔ̃plimã də se pʁɔf/	Analysed	No

<sup>2</sup> All underlined words are used from Delayed-repetition word task in Table 3.1<sup>3</sup> The transcriptions represent only Continental French pronunciation of the words

### 3.3.3. Choice of Extemporaneous Speaking Task

The final portion of the recordings consisted of an extemporaneous speech component. All of the speakers were given a sequence of images that told a story of two individuals walking with briefcases who bump into one another, causing them to accidentally exchange suitcases (Derwing, Munro & Thomson, 2007). This made the speakers even more likely to speak in their own accents, as there was no audio stimuli – apart from the instructions – that could influence their accents. There were no words written on the images, so speakers also had to use their own vocabulary. A drawback to this method is that other factors, such

as the speakers' grammar and lexicon would vary from speaker group to speaker group, as well as from speaker to speaker. However, the images provided were always the same for each speaker, which allowed for the production of similar lexical content from each speaker and for a more reliable and valid description of the speech content. The extemporaneous speaking task would also help measure speakers' rate of speech production in order to assess their fluency and pronunciation. Extemporaneous productions were between one and three minutes long on average.

### **3.3.4. Elicitation procedure**

Instructions preceded each task, followed by an example (for both word and sentence repetition tasks). The instructions and task stimuli were edited using Audacity (Audacity, 2014), and Sony Movie Maker was then used to pair them up with an interchanging red and green screen that would signal to the speaker when to listen (red screen) and when to speak (green screen). As the instructions were all in French, the speakers were also given verbal instructions in English before entering a sound-treated room in the Applied Phonetics Lab in the Department of Linguistics at Simon Fraser University. Therefore, all the speakers (both Anglophone or Francophone) were given both English and French instructions, and could stop the program to ask questions at any time. If questions arose about a task or a particular stimulus, they could get another explanation or have the stimuli repeated to them.

Audacity was also used to record the speakers, and each recording was edited to separate all words, sentences, and extemporaneous narrative. For example, each word was placed in a separate folder, and named after the word and speaker code (ie: for the /ʃato/ folder, the names would have been CHATEAU1469, CHATEAU1867 etc.).

Listeners were also asked to listen to the stimuli in the soundproof room. Using Praat, the word order was randomized so that each listener heard the words in a different order. It was possible for the listeners to replay each word up to 3 times before they made their evaluation, at which point the next stimulus word was presented. The data from listeners was also collected using Praat and were entered into a spreadsheet for analysis.

Finally, after all the rating and choice tasks were completed, formant analyses were conducted on select tokens using Praat, with measurements taken from 1/3 of the way for the sound tokens /y/ and /u/ using linear predictive coding. Voice Onset Time (VOT) measurements were also taken from *temps*, to assess the length of the /t/ for FI vs. CF. The VOT results were measured a second time by another researcher to improve reliability. A consensus was reached and any inconsistencies between measurements were discussed and changed accordingly.

### **3.3.5. Choice of ratings**

The perceptual analysis used in this research to determine the degree of foreign accent among FI and non-FI students follows previously used practices (Jesney, 2004). Each listener was asked to evaluate the pronunciation of the speakers for all three tasks. Three separate kinds of evaluations were used: two Likert scale evaluations and one program ID choice task (forced choice task). According to a comparative analysis of 49 L2 phonetic studies by Jesney (2004), five-point Likert scales (for short elicitations) and nine-point Likert scales (for longer elicitations) were the mostly commonly used scales for pronunciation perception and evaluation analyses. In this case, the five-point scale was used to evaluate the quality of the selected sounds in the three words *bureau/temps/lundi*, ranging from 1 (poor) to 5 (excellent). Listeners heard one word from all the speakers before moving on to the next word.

After all the words and all the speakers had been heard and evaluated, the next task was to evaluate the global pronunciations of the full sentences repeated by speakers in the above delayed-repetition sentence task. Flege (1984) demonstrated that a 30 millisecond clip of the English /t/ was enough for native speakers of English to assess speakers' nativeness with 69% accuracy. However, the same study also showed that that accuracy increased to 89% when longer elicitations of speech were presented, such as sentences or phrases. For this reason, it was surmised in this study that the ratings for whole sentences would offer a more reliable rating of FI and non-FI students' accents. The sentences were rated on a scale of 1 (No Foreign Accent) to 9 (Very Strong Foreign Accent). The nine-point scale was used because wider rating scales are better suited for longer stimuli and are better at avoiding a ceiling effect than a seven-point scale, (Southwood & Flege, 1999; Jesney, 2004). Listeners were also asked to identify which program they believed the speakers completed.

The final evaluation was for extemporaneous speech. Listeners were asked to only focus on the speakers' pronunciation. Again, using the 9-point scale from the sentence repetition task, listeners were asked to rate only speakers' pronunciation and again, as with the sentence repetition task, listeners were asked to choose which French program the speakers had completed, again based on pronunciation. Each speaker's whole recording was made available to the listeners and it was up to them how much they wanted to hear before moving on to the next speaker. Once listeners entered a response, playback stopped and the next item was presented.

The analysis of the results found that the initial program choice tasks had been too difficult, which the listeners had also expressed during the task itself. This was because some of the programs were less familiar to all of the listeners (such as IF), due in some cases to a lack of experience with some of the programs. Furthermore, there were an uneven number of PC speakers in relation to CF and FI speakers. For this reason, five of the seven listeners returned (one

was away and one had not been familiar with the French programs in BC) and used a two-choice forced-choice task (program ID choice task) to guess which program the speakers had completed. Only CF and FI were used for this task. EI and LI were treated as a single category (FI) because the earlier rating results showed no significant difference between the ratings of the two groups. The stimuli listeners used for this task were the same word, sentence and extemporaneous utterances.

## **Chapter 4.**

### **RESULTS**

This chapter presents all perceptual analysis results. In sections 4.1 to 4.3, the results of the listeners' rating and program ID choice tasks will be discussed. In section 4.4, the acoustic characteristics of the FI speakers' pronunciation will be examined to see if certain sounds are characteristic markers of an FI group accent.

#### **4.1. Web Survey Results**

##### **4.1.1. Speaker Web-Surveys**

As was mentioned in the methodology section, speakers were asked a number of questions about themselves and their experiences with French programs in BC (ANNEXE A). Specifically, FI speakers were asked about their relationships with peer FI students. As was mentioned before, Courcy (2001) found FI students to have closer interpersonal relationships with FI peers than with English-program peers. As this could potentially explain why FI students have a common accent, the FI speakers participating in this research were asked how much time they spent with their FI peers in comparison to with their English program peers in a) the school setting; and b) outside of school.

Table 4.1 shows that the majority of speakers spent much more time with their FI peers in school, with LI speakers claiming to have spent the most of their time with their FI peers. These findings are similar to Courcy's (2001), showing



that FI students were closer to their FI peers than to students outside the program, in the school environment.

**Table 4.1. Amount of Time Spent with FI Peers in School (FI Speaker Self Ratings)**

Program	Much More Time	A Little More Time	An Equal Amount of Time	A Little Less Time	A Lot Less Time
EI	5	0	1	1	0
LI	4	0	0	0	0

Outside the school setting, LI speakers still spent the most time with their French program peers, as seen in Table 4.2. below. In fact, 6 out of 7 EI speakers claimed to have spent at least an equal amount of time with their FI peers as with their English program peers. These findings also seem to corroborate Courcy’s case study results.

**Table 4.2. Amount of Time Spent with FI Peers Outside of School (FI Speaker Self Ratings)**

Program	Much More Time	A Little More Time	An Equal Amount of Time	A Little Less Time	A Lot Less Time
EI	2	3	1	0	1
LI	3	1	0	0	0

#### **4.1.2. Listener Web-Surveys**

A second web survey asked listeners what kind of accent they believed FI students had, if any. These questions were asked only after listeners completed the rating tasks, to minimize any rating biases (i.e. to prevent listeners from actively looking for an accent). Listeners were specifically asked if they thought that FI students had similar accents to each other, to CF students, to PC students, and if they could not discern any particular accent. Of the 7 listeners, 5 thought FI students had accents that were more homogeneous and did not

resemble the accents of either CF or PC students. Two of the listeners thought FI students sounded like PC students and none of the listeners thought that FI students sounded like CF students.

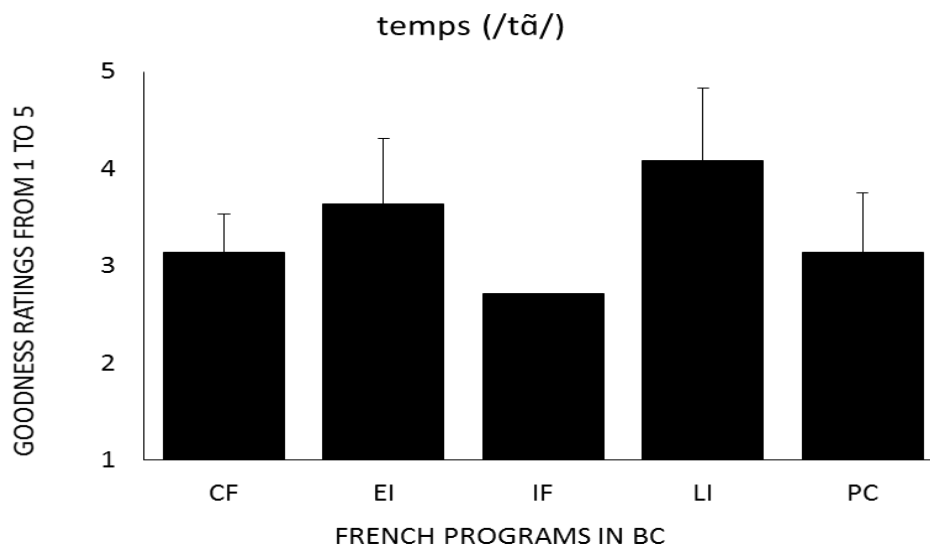
## **4.2. Rating results**

The web survey questions were designed to probe listeners' attitudes towards FI speakers' accents. The chief focus of this research, however, was the rating and program ID choice tasks performed by listeners. As mentioned before, these two tasks were necessary to provide evidence for or against FI accents. The sections below present the listener ratings data for words, sentences and extemporaneous narratives. The basic findings are covered first, followed by the statistical analysis in a separate section. Afterwards, the third section presents the results for the forced-choice tasks, which again looked at word tokens, sentences and extemporaneous narratives.

### **4.2.1. Word token Mean Values**

Figures 4.1 to 4.3 display the mean ratings for goodness assigned to target words. Listeners were asked to give ratings based only on the target sound (as indicated in the task), although they all heard the whole word each time. Even without further analysis, it is evident that the listener ratings are quite similar across groups for the /t/ token, from *temps*, as seen under Figure 4.1. Mean scores from 5 (1 = poor /t/ production; 5 = excellent /t/ production) indicated that CF speakers /t/ productions were rated as being only slightly worse than those of EI and LI speakers (CF = 3.14 vs. EI = 3.63, and LI = 4.09), while PC speakers' mean ratings were similar to CF speakers (3.14). The IF speaker had the lowest mean score (2.71) while LI speakers had the highest mean score, indicating that their /t/ production was considered to be the most native-like by listeners, though none of the speaker groups were rated as sounding native.

**Figure 4.1. Pronunciation Ratings for Temps<sup>4,5</sup>**



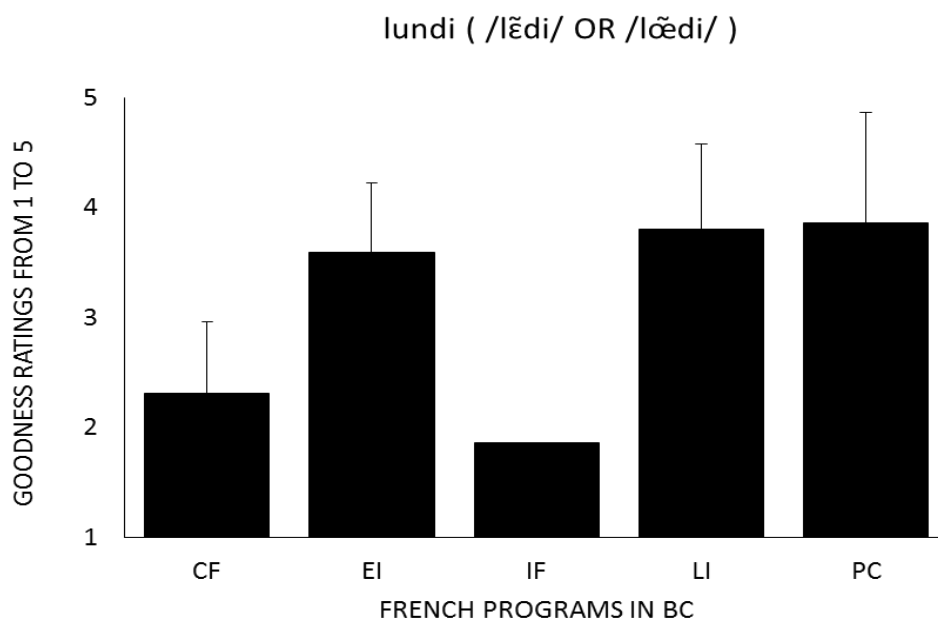
<sup>4</sup> Goodness ratings from 1 (poor token pronunciation) to 5 (excellent token pronunciation)

<sup>5</sup> Listeners were instructed to rate /t/

The /œ̃/ and /ɛ̃/ ratings produced mean differences between EI and CF speakers and LI and CF speakers. In both cases, EI and LI speakers were rated better than CF speakers, according to the mean values. The one IF speaker's ratings were closer to the CF mean value than to other speaker groups, as indicated in Figure 4.2 (Mean 2.31, 3.59 and 3.57 for CF, EI and LI respectively). Again, the IF speaker had the worst rating. However, as there was only one IF speaker, it is difficult to tell if the scores shown for all three figures represent a norm for all IF students, or if this is the trend simply for this one speaker. As a result, this speaker's results will not be analysed for statistical significance.

Since both /œ̃/ and /ɛ̃/ are acceptable productions of the same nasal vowel among the varieties of French, listeners were asked to accept both variants as native, though it is unknown if they actually followed this instruction. EI and LI mean scores were closer to PC ratings (PCMean = 4.86), than to CF mean ratings.

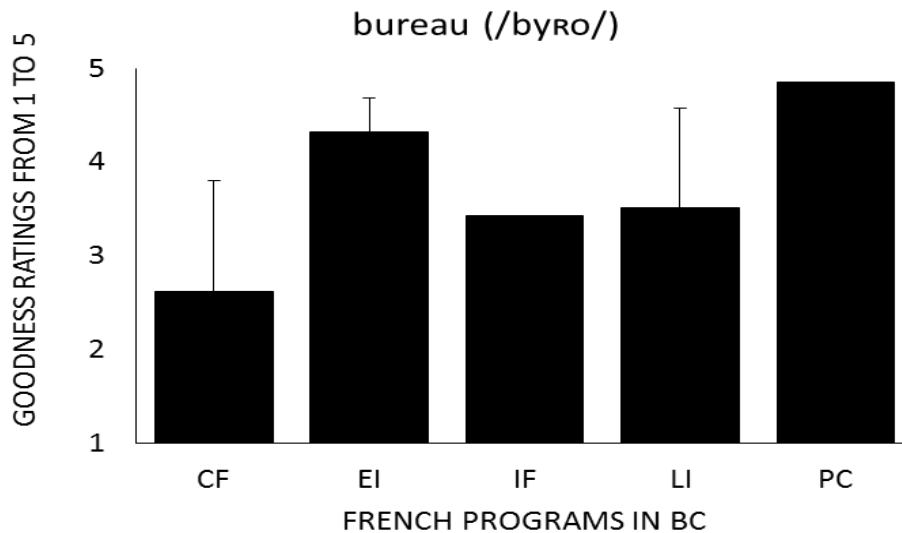
**Figure 4.2. Pronunciation Ratings for Lundi<sup>6</sup>**



<sup>6</sup> Listeners were instructed to rate /ɛ̃/ or /œ̃/

In contrast, mean rating differences for *bureau* (/y/) did not appear as wide as for *lundi* mean differences, as shown in Figure 4.3. In general, mean ratings were higher for all the groups than they had been for *temps* mean scores. Listeners again rated EI speakers as better than CF speakers (2.62 and 4.33 for CF and EI means respectively). The mean difference between the CF and EI groups (1.71) was higher than the mean difference between EI and CF for *lundi*. Mean scores for EI and PC were still close (4.33 and 4.86 respectively), with PC scores being slightly better than EI mean scores. However this time, the IF mean value was almost as high as for LI speakers (3.43 and 3.51 respectively). This could demonstrate that although all the tokens selected were deemed problematic for L2 learners of French, as mentioned in the methodology section, /y/ production was perhaps more easily mastered by speakers.

**Figure 4.3. Pronunciation Ratings for Bureau<sup>7</sup>**

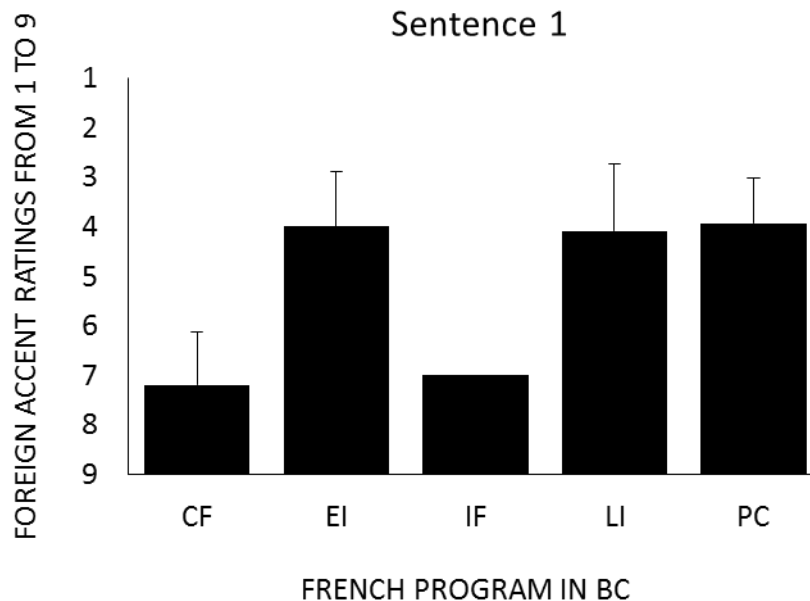


<sup>7</sup> Listeners were instructed to rate /y/

#### **4.2.2. Sentence Mean Values**

Mean ratings for sentences presented wider mean differences between some speaker groups than was found in the word rating task. Mean values for *S1* (*Ily a un tombeau au milieu du pré*) under Figure 4.4 indicate that ratings for the CF group were higher than for other speaker groups, meaning they were judged as being more foreign accented (7.19). Once again, IF and CF ratings were very similar (7.00 and 7.19 respectively). Interestingly, the mean values for EI, LI and PC were also similar (4.00, 4.09 and 3.93 respectively), and even PC speakers were not rated as sounding perfectly native-like for this sentence. However, Figure 4.4 does show evidence that listeners could distinguish between FI and CF groups by pronunciation alone.

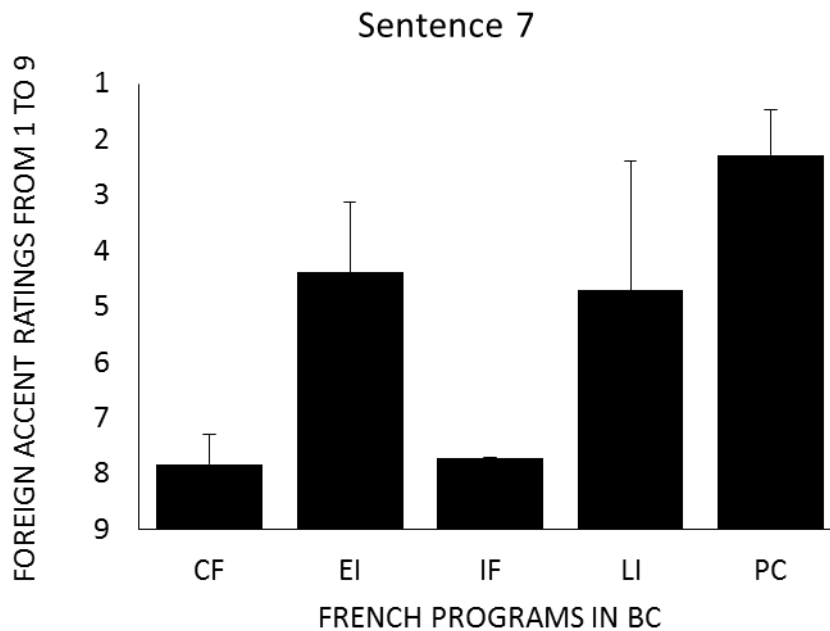
**Figure 4.4. Pronunciation Ratings for Sentence 1<sup>8</sup>**



<sup>8</sup> Listeners were instructed to rate the French pronunciation of the whole sentence from 1 (native accent) to 9 (very strong foreign accent).

Listeners were even better at distinguishing between speaker groups for *S7 (Lundi, si j'ai le temps)* than for the other stimuli, as indicated by Figure 4.5. CF, EI and PC showed the greatest mean differences among groups (7.83, 4.39 and 2.29 respectively), while mean values for CF and IF showing the smallest difference (7.83 and 7.71 respectively). LI scores were only trivially higher than EI scores. The low mean difference between EI and LI shows evidence that listeners do not find LI speakers to have much more of a foreign accent than EI speakers. However, neither EI or LI speaker groups were rated as native speakers and both were rated as sounding less native than PC speakers.

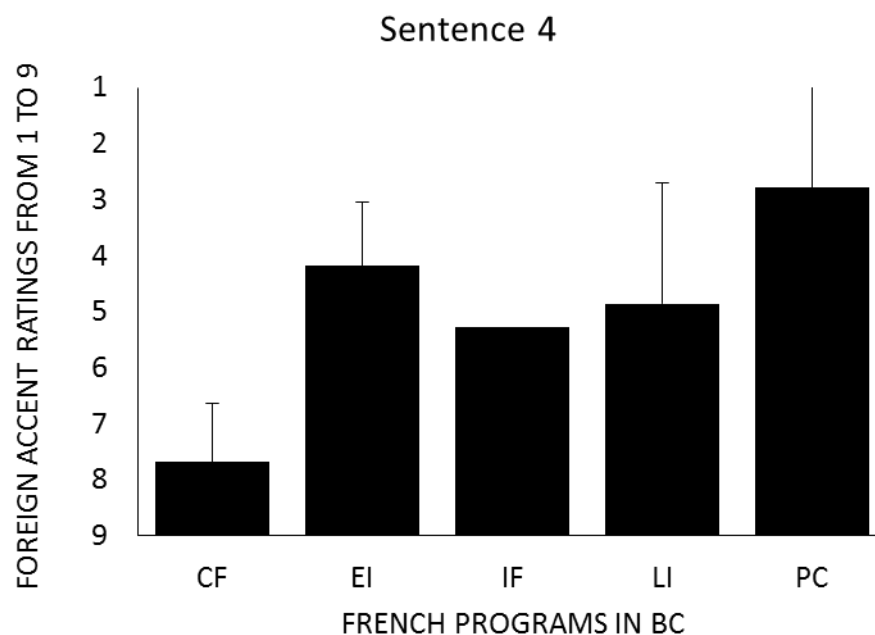
**Figure 4.5. Pronunciation Ratings for S7<sup>9</sup>**



<sup>9</sup>Listeners were instructed to rate the French pronunciation of the whole sentence from 1 (native accent) to 9 (very strong foreign accent).

*S4 (J'ai laissé les documents à mon bureau)* also showed more clear mean group differences as indicated in Figure 4.6. However listeners were not able to make as clear a distinction between some speaker groups as they had for *S7*. This time, IF and CF mean values were not similar (7.69 and 5.29 respectively), and were closer to EI (4.18) and LI (4.86) mean values. PC mean values of 2.79 suggest that this speaker group was again rated as more native-like than all other speaker groups. The mean difference between the FI groups was low (0.68) which might indicate again, that listeners found it difficult to distinguish between the accents of the two groups.

**Figure 4.6. Pronunciation Ratings for S4<sup>10</sup>**



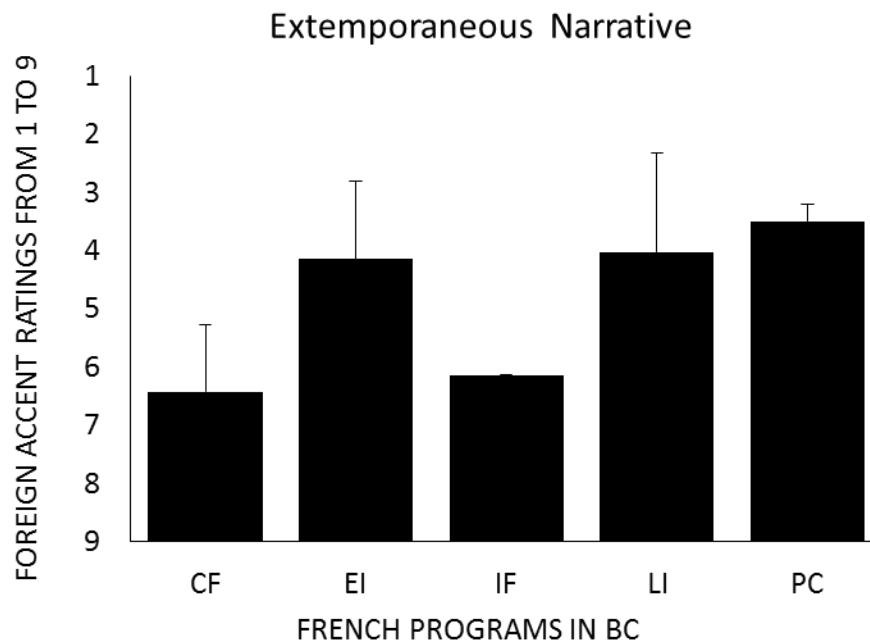
<sup>10</sup>Listeners were instructed to rate the French pronunciation of the whole sentence from 1 (native accent) to 9 (very strong foreign accent).

### **4.2.3. Picture Narration (Extemporaneous Speech) Mean Values**

Mean foreign accent ratings for the extemporaneous narration seemed to indicate that the pattern of FI students being rated between CF and PC students continues, as indicated by Figure 4.7. However, it does appear that CF speakers were rated as sounding more native for the extemporaneous narration task (mean score of 6.43), than for the sentence tasks. The EI and LI groups were rated much the same, with mean scores of 4.14 and 4.57, respectively. Once again, the PC group was rated as having the least foreign accent, with a mean score of 3.50, though this score was lower than the group's score for the sentence rating tasks.



**Figure 4.7. Pronunciation Ratings for Extemporaneous Speech**



#### **4.2.4. Statistical Analysis of Speaker Group Mean Scores**

Ratings for the speakers were submitted to a series of Analysis of Variance (ANOVA) tests for between-group analysis. Only EI, LI and CF speakers were used for analysis, because they had similar numbers of participants. Among these groups, the ANOVA tests indicated significant group effects for *lundi*:  $F(2,14) = 7.445, p = 0.006$ ; *S1*:  $F(2,14) = 13.433, p = 0.001$ ; *S7*:  $F(2, 14) = 11.854, p = 0.001$ ; *S4*:  $F(2,14) = 11.870, p = 0.001$ , and for extemporaneous speech:  $F(2,14) = 5.508, p = 0.017$ .

In the case of *temps*, however, the between-group effect was not significant ( $F(2,14) = 2.103, p = 0.159$ ). A Welch test for equality of means was applied to address a violation of the homogeneity assumption for *bureau*. It indicated a significant between-group effect for *bureau* for EI and CF groups:

$F(2,14) = 5.961, p = 0.018$ . The test of homogeneity of variance suggested no other violations for words, sentences and the extemporaneous narratives.

A series of post hoc pairwise comparisons were computed to further explore the between-group differences. Bonferroni adjusted tests indicated that for *lundi*, both the EI group and LI group were rated significantly better than the PC group ( $p = 0.01$  and  $0.028$  respectively), while the EI and LI groups did not differ significantly from each other ( $p \approx 1.000$ ). The tests revealed no significant difference between any of the groups for *temps* (as was previously indicated by ANOVA testing). In the case of *bureau*, Games-Howell tests were used because of the violation of the homogeneity assumption. These indicated that only the EI group performed better than the CF group ( $p = 0.035$ ), while the LI group did not differ from either the CF group or the EI group ( $p = 0.682$ , and  $0.092$  respectively).

For the sentences, the Bonferroni adjusted test indicated that both the EI group and LI group were rated as significantly less accented for *S1* than the CF group ( $p = 0.001$  and  $0.006$  respectively). Once again, there were no significant differences between the EI group and the LI group. The findings were parallel for *S7*, with ratings for the EI and LI groups being significantly better than ratings for the CF group ( $p = 0.001$  and  $0.033$ ). Only the EI group was rated as significantly better than the CF group for *S4* ( $p = 0.001$  vs.  $p = 0.062$ ). Again, for both *S7* and *S4*, there were no significant differences between the EI group and the LI group ( $p = 0.699$  and  $0.382$  respectively).

Finally, the extemporaneous productions were found to be rated similarly to *S4*, with only the EI group being statistically different from the CF group ( $p = 0.019$ ). In this case there were no significant differences between either the LI and CP groups or the LI and EI groups ( $p = 0.124$  and  $\approx 1.000$  respectively).

In summary, of the three words, only the *lundi* and *bureau* results demonstrated significantly better ratings for the EI and LI groups than the CF group. As pointed out at the beginning of 4.2.4, IF and PC ratings were excluded from all statistical analyses. EI and LI speakers were not found to be significantly different, however, for any of the word tokens. The results for sentence and extemporaneous narrative ratings were found to be slightly different from the results for word token ratings. This time, there were clear between-group differences for all items. The EI and LI groups were statistically better than the CF group for *S1* and *S7*. However, the LI group was not significantly better than the CF group for *S4*. Similar to the word ratings, EI and LI groups did not exhibit statistical significance for sentence and extemporaneous narration ratings. With respect to EI and LI, it was generally found that the rating differences were always too small to be statistically meaningful, and EI and LI groups therefore never differed significantly. Furthermore, the EI group ratings were always significantly better than the CF group for sentence and extemporaneous narration ratings. In most cases, LI groups were also rated as being significantly better than CF groups.

### **4.3. Program ID Choice Task**

Due in part to the listeners being somewhat unfamiliar with high school and elementary school programs in BC, the original program ID choice task – in which they were asked to identify all speakers' French program backgrounds – proved to be too difficult in most cases. This was because the university French programs do not split FI students from non-FI program students for second, third and fourth year French courses.) The listeners mostly chose not to answer this question, as was mentioned in the methodology.

In order to obtain usable data on listeners' perceptions, five of the seven listeners were invited to return to perform a revised version of the task. Speakers

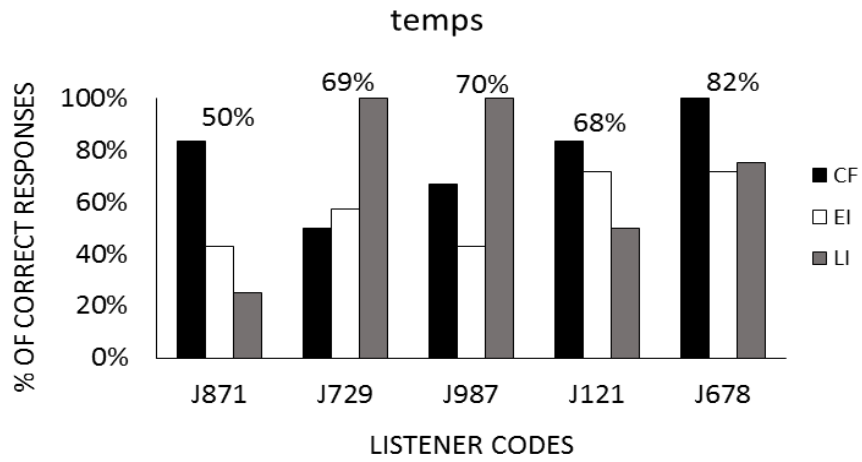
from the IF and PC were eliminated for this task for two reasons: (1) their numbers were not equal to the number of FI and CF speakers (there were only 1 IF and 2 PC speakers and such a low number of participants was not statistically useful); (2) because listeners were the least familiar with these two programs. Listeners were asked to listen to all the words, sentences and extemporaneous narrations once again and choose whether they believed the speakers were FI or CF. Because the ratings data indicated that differences between EI and LI were not statistically different, the two programs were grouped together under the category of FI for the program ID choice task. Consequently, listeners had only two groups from which to choose, instead of five.

#### **4.3.1. Program ID Choice Task Results**

The results from the listening task were tallied and as demonstrated by Figures 4.8, 4.9 and 4.10, listeners were able to correctly identify the speakers' programs most of the time. The three figures show the accuracy of each listener per category and demonstrate that in all cases except one, every listener was able to correctly identify speaker categories with better than 50% accuracy for all three word tokens. Furthermore, listeners had an accuracy rating of 67%, 68% and 65% for *temps*, *lundi* and *bureau*, respectively. It was also found that the accuracy results for EI were similar to LI speakers' results.

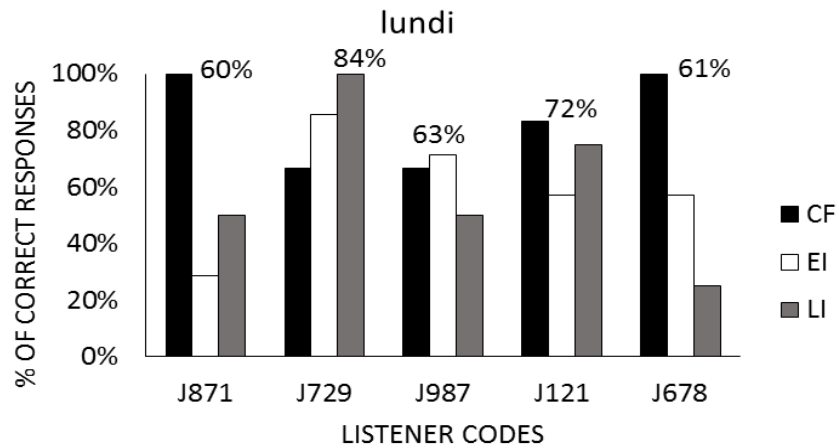
However, though the word rating results under 4.1 had been statistically significant for two out of the three words, the accuracy ratings for words in the program ID choice task were only slightly above chance. This may mean that although individual words were in some respects enough speech for identifying the kind of program the speakers finished, they yielded less accurate results than longer elicitations.

**Figure 4.8. Correct Speaker Program Choices by Judges for “Temps”<sup>11</sup>**



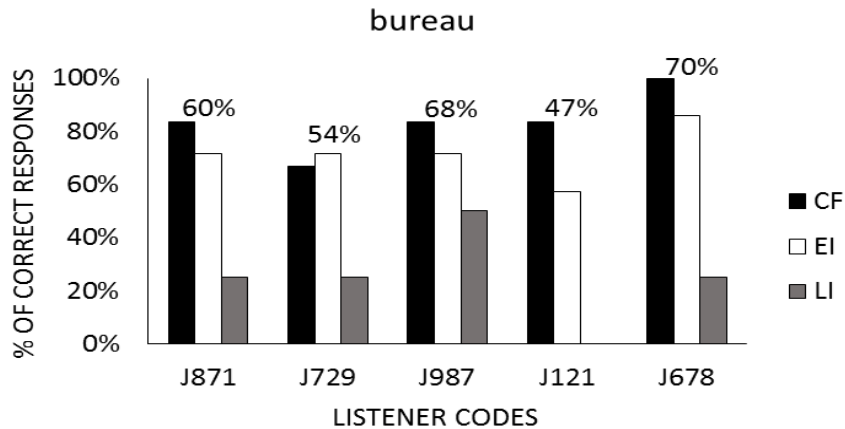
<sup>11</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

**Figure 4.9. Correct Speaker Program Choices by Judges for “Lundi”<sup>12</sup>**



<sup>12</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

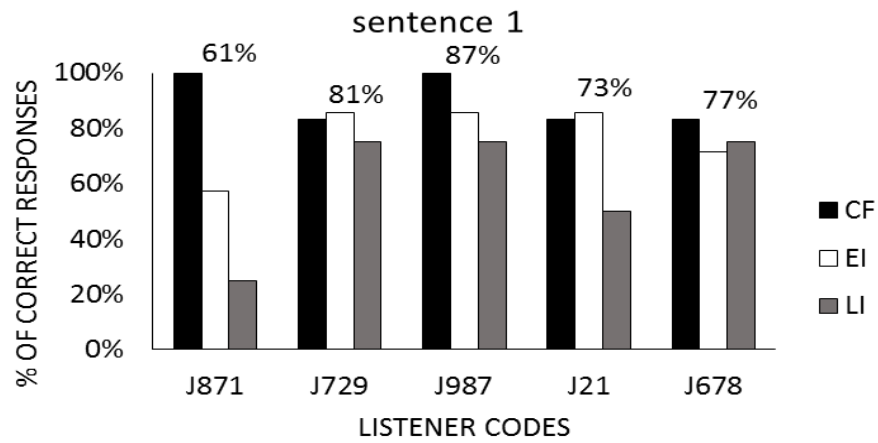
**Figure 4.10. Correct Speaker Program Choices by Judges for “Bureau”<sup>13</sup>**



<sup>13</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

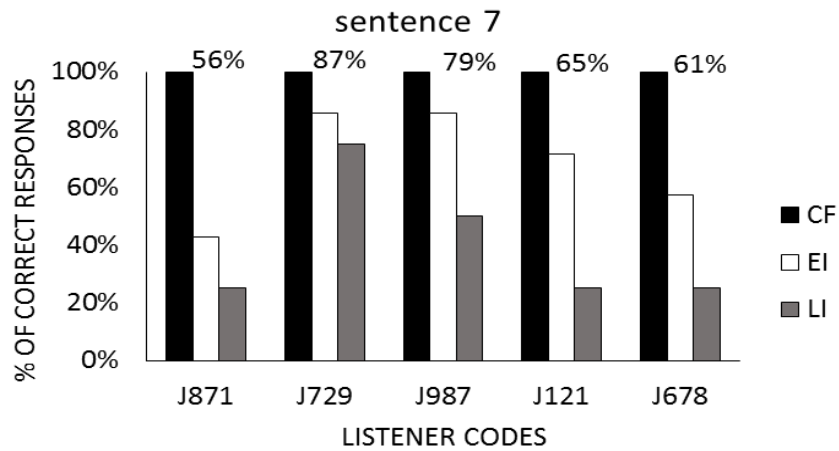
Results from the previously discussed rating-task indicated more statistically significant results for sentence ratings than for word token ratings. Furthermore, longer stimuli also demonstrated more accurate results from judges (Flege, 1984). It was therefore expected that the sentence program ID choice tasks results, presented below, would yield more significant results as well. This proved indeed to be the case, especially for CF speakers (90% accuracy from listeners for *S1*, 100% for *S7* and 97% for *S4*), as can be seen under Figures 4.11 to 4.12. Here, all listeners were well above 50% chance. Listeners were accurate 75.8% in guessing what program speakers finished for *S1*, were accurate 69.6% of the time for *S7*, and 79.8% of the time for *S4*. Furthermore, every listener was accurate above chance for each observed sentence.

**Figure 4.11. Correct Speaker Program Choices by Judges for S1<sup>14</sup>**



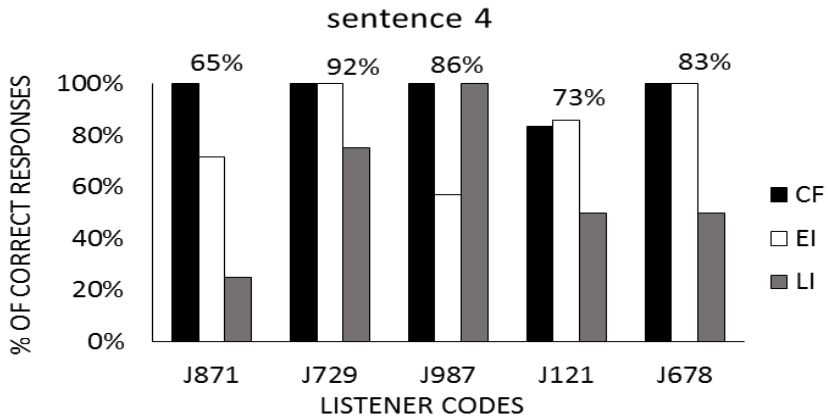
<sup>14</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

**Figure 4.12. Correct Speaker Program Choices by Judges for S7<sup>15</sup>**



<sup>15</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

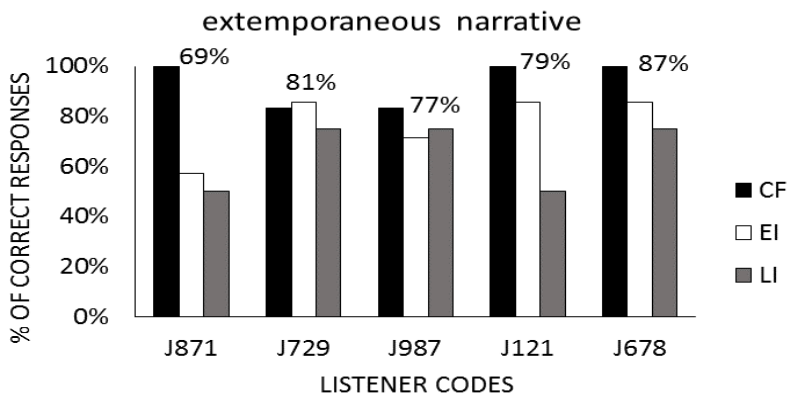
**Figure 4.13. Correct Speaker Program Choices by Judges for S4<sup>16</sup>**



<sup>16</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.

The extemporaneous results were very comparable to the sentence results. As seen in Figure 4.14, CF speakers were the most accurately labeled (with a 93% accuracy rating), followed by EI (77%) and then LI (65%). However, in this case the gap between EI and LI results was smaller, and again accuracy results ranged from 69% to 87% for listeners. In total, the listener results for this last task were 80% accurate.

**Figure 4.14. Correct Speaker Program Choices by Listeners for Extemporaneous Speech<sup>18</sup>**



<sup>18</sup> Percentages indicate the overall choice accuracy for all three speaker groups per listener.



### 4.3.2. Program ID Choice Task Significance Results

Further formal analysis was conducted to account for significance. The total number of correct program identifications was determined for each listener, for each word, sentence and extemporaneous speech sample. The binomial distribution was used to evaluate whether each total was statistically better than chance. All results found to be 0.05 or below are significantly better than chance performance. These outcomes are summarized in Table 4.3.

Listeners scored above chance levels only 6 times for individual word tokens: two listeners for each word. For the sentences, three out of five listeners scored above chance for *S1* and *S7*. All listeners scored above chance for *S4* and for the extemporaneous narration. The results of the ID choice task may indicate that it was easier for the listeners to identify programs when they heard longer utterances (sentences and extemporaneous speech vs. words).

**Table 4.3. Binomial Probability Results for Words, Sentences and Extemporaneous Narration**

Item	j871	j729	j987	j121	j678
<i>temps</i>	0.1855	0.0944	0.0944	0.0472*	0.0052**
<i>lundi</i>	0.1484	0.0052**	0.0944	0.0472*	0.0944
<i>bureau</i>	0.0944	0.1484	0.0472*	0.1855	0.0182*
<i>S1</i>	0.0944	0.0052**	0.0010***	0.0182	0.0182*
<i>S7</i>	0.1484	0.0010***	0.0052**	0.0472*	0.0944
<i>S4</i>	0.0472*	0.0001***	0.0052**	0.0182*	0.0010***
Narration	0.0472*	0.0052**	0.0182*	0.0052**	0.0010***

\*  $p < 0.05$

\*\*  $p < 0.01$

\*\*\*  $p < 0.005$

Evidence suggests that listeners could distinguish FI from CF speakers at above chance levels. The listeners' performance was by no means perfect and there appears to be a difference in their success at differentiating between speakers. For example, listener j871 was only able to differentiate significantly between speakers for *S4* and the narration task. Listener j729 was the best at

differentiating between speaker groups. In general, the longer the elicitations were, the more likely listeners were to distinguish between FI and CF speakers.

Further analysis as summarized under Table 4.4 suggests that some speakers were more readily identified as FI or CF than others. Only FI two speakers (EI1469, LI1847) were more readily labeled as CF. Of these two, LI1847 was most often mistaken as a CF speaker.

**Table 4.4. Percentage of Times Each Speaker’s Program was Correctly Identified**

Speakers	Speakers L1	words	sentences	narration
CF1806	TA**	93%	93%	100%
CF5844	MA	60%	93%	100%
CF7209	EN	93%	93%	60%
CF7716	EN	93%	100%	100%
CF8024	KO	47%	93%	100%
CF9685	EN	100%	100%	100%
EI1469*	EN	73%	40%	40%
EI2080	EN	53%	87%	80%
EI2523	EN	27%	80%	60%
EI2893	EN	93%	87%	100%
EI2981	EN	73%	80%	80%
EI8048	EN	53%	87%	80%
EI8550	EN/SP/RU	67%	73%	100%
LI1847*	EN	33%	27%	20%
LI2009	EN	47%	80%	100%
LI5481	EN	40%	53%	60%
LI9778	EN	87%	53%	80%

\*Star indicates speakers who were most often erroneously labeled by listeners.

\*\* For Abbreviations see Table 3.1.

## 4.4. Acoustic Analysis

In order to see just how much of a phonetic difference there was between CF and FI speakers, it was also important to look at the individual characteristics of the sounds produced by FI or CF speakers and see if any similarities arose.

### 4.4.1. /t/ Voice Onset Time (VOT) for FI and CF Speakers

Following the analysis of the speaker rating and program ID choice task results, the /t/ from *temps* was looked at to see if any measured differences between FI and CF speakers could be reported. The /t/ from *temps* yielded no significant difference for 1-5 accent ratings among EI, LI and CF speakers, as seen in 4.1.1. However, it has been shown that a L2 speaker's production of L2 sounds is often affected by the speaker's L1 production of that sound (Flege, 1991). Consequently, if FI students merely had an English accent, it would be expected that the VOT of the /t/ would be closer to that of the English sound rather than French sound. There are noticeable differences between English and French /p/, /t/, /k/ stops. The French /t/ is a voiceless dental stop formed with the tip of the tongue pressed against the back of the front teeth and has a short-lag VOT, while the English /t/ is formed when the tip of the tongue meets the alveolar ridge (Dalbor, 1980; Flege, 1991) and has long-lag voiceless aspiration (Abraham and Lisker, 1973; Williams, 1977; Flege and Eefting, 1986). The VOT values measured for all speakers, along with the 1 (poor) to 5 (excellent) ratings from the word tokens ratings task and percentage of correct program guesses can be seen in Table 4.5.

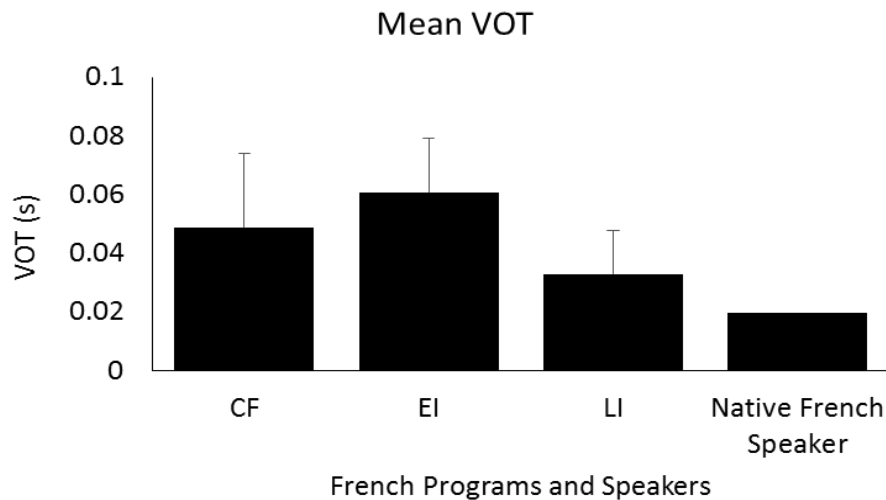
**Table 4.5. Table of VOT, Ratings and Program ID Choice Results**

Speaker Code	VOT (s)	Ratings Score*	% of Correctly Identified Programs
CF1806	0.019	2.86	100%
CF5844	0.076	3.43	80%
CF7209	0.058	3.71	80%
CF7716	0.069	2.86	80%
CF8024	0.018	3.29	20%
CF9685	0.056	2.71	100%
EI1469	0.068	4.29	80%
EI2080	0.049	3.43	60%
EI2523	0.08	2.71	0%
EI2893	0.021	4.71	100%
EI2981	0.047	3.29	80%
EI8048	0.047	3.71	40%
EI8550	0.113	3.29	40%
IF7328	0.039	2.71	N/A
LI1847	0.017	3.00	60%
LI2009	0.069	3.86	40%
LI5481	0.024	4.00	80%
LI9778	0.021	4.71	100%
PC7020	0.066	3.57	N/A
PC7261	0.060	2.71	N/A
French speaker	0.020	N/A	N/A

The recorded voice of the native French speaker used as a model for the recordings had a VOT of 0.0196s (Table 4.3.). As Figure 4.15 indicates, on average, it was found that the VOT of CF speakers was longer than the VOT of native French speakers /t/ ( $M = 0.049s$   $SD = 0.025s$ ), but shorter than the average VOT of EI speakers ( $M = 0.061s$   $SD = 0.030s$ ). LI VOT was recorded to be the shortest, though still not as short as the native French speaker's /t/, measured in this research ( $M = 0.033s$   $SD = 0.024s$ ). Out of these participants, only CF speakers (and among them only 2) managed to produce lengths that were closer to the expected length of the native French /t/ (with lengths of 0.019s

and 0.018s for CF1806 and CF 8024 respectively). Furthermore, 100% of listeners guessed that speaker CF1806 completed CF, while only 20% of judges guessed correctly for speaker CF8024. However, it did not appear that FI speakers generally had more a native VOT for /t/.

**Figure 4.15. Correct Speaker Program Choices by Judges for Extemporaneous Speech**

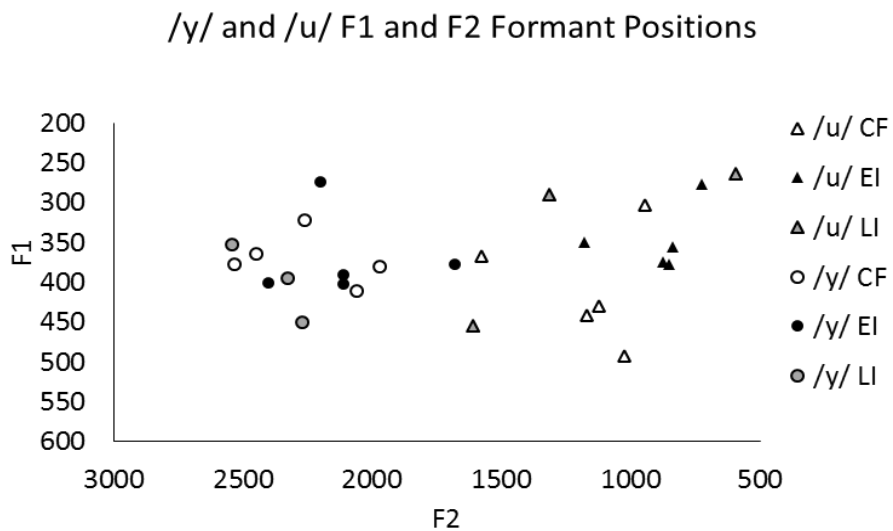


#### 4.4.2. Formant Analysis

Previous research has indicated that F2 frequencies are better indicators of French /y/ and /u/ production accuracy than F1 or F3 frequencies (Flege & Hillenbrand, 1984). However, other studies have looked at both F1 and F2 formants to see the spread from speaker group to speaker group for each analyzed token. This includes a study conducted by Munro, Derwing and Saito (2012), who compared Slavic and Madarin speakers' vowel acquisition over a seven year period. For this research, the words *bureau* (word analysed by listeners) and *coup* (not analysed by listeners) were used and only female speakers' formant measurements were taken into account due to the very low number of male speakers (4).

Figure 4.15 demonstrates the F1 and F2 formant frequencies of CF, EI and LI female speakers spread across a scatter plot. It was noted that some of these values had to be manually measured due to erroneous results from Praat. According to Figure 4.15, there does seem to be a separation for /y/ (*bureau*) and /u/ (*coup*) sounds for all three speaker groups, though the degrees of separation vary between groups (as can be seen with the means scores in Table 4.6. below).

**Figure 4.16. /y/ and /u/ Formant positions for CF, EI and LI Speakers**



**Table 4.6. /y/ and /u/ Formant Measurements (Hz) for CF, EI and LI Females**

Speaker Group	F1 /y/	F2 /y/	F1 /u/	F2 /u/
CFMean	371	2255	407	1168
EIMean	368	2102	347	895
LIMean	399	2379	336	1175

The mean F2 frequency for /y/ for EI speakers differed very slightly from CF speakers (153Hz higher for CF), while LI speakers differed even less from CF and were higher (124Hz higher for LI speakers than for CF).

For an English speaker to produce a native French /u/, the F2 frequency would have to be low (Flege, 1987). EI speakers did produce a lower mean frequency for /u/ than CF speakers (a difference of 273Hz). It was expected that LI speakers would follow this trend and have a lower F2 frequency than CF speakers. Flege (1987) found that as groups gained experience in a language, their /u/ frequency became lower. However, in the present study it was found that mean /u/ frequency production for LI was very slightly higher by 7Hz.

#### **4.4.3. Statistical Evaluation of /y/ and /u/ Formant Frequencies and VOT**

Though Figure 4.15 did visibly demonstrate a general formant difference between /y/ and /u/ production between FI and CF speakers, the graph showed that there was not sufficient data to identify individual differences between FI and CF groups for each token sound. For this purpose, t-test significance testing was again applied. The testing revealed that when speakers were divided into CF vs. FI categories for F1 and F2 /y/ and /u/ tokens, there was no significant difference between the two groups. This meant that any differences in listeners' ratings could not be attributed to speakers' F1 or the F2 scores (yF1  $p=0.734$ ; yF2  $p=0.738$ ; uF1  $p=0.123$ ; uF2  $p=0.360$ ).

On the other hand, further t-tests indicated that the F3 measurement was significantly lower (meaning better) in /y/ for the EI group than for the CF group ( $p=0.001$ ). Furthermore, when F1 and F2 were normalized by dividing them by F3, the ratio for F1 and F3 for /u/ was significantly lower for the FI group than for the CF group ( $p=0.035$ ) [F1 and F3 ratios for /u/ were significantly lower for the FI group than for the CF group ( $p=0.035$ )]. No other significance was found for /u/.

Further t-testing also revealed that there was no evidence of a difference in /t/ VOT among three groups ( $p=0.415$ ). This is perhaps not surprising, as there

was also no significant difference between the CF, EI or LI groups for the ratings task for *temps* (as seen under 4.2.1).



## **Chapter 5.**

### **DISCUSSION**

The present research on the pronunciation of FI graduates in British Columbia aimed to determine whether or not the FI program leads students to develop an L2 French accent that differs from the traditionally expected Anglophone accent. The research stems from a lack of previous studies on the pronunciation of French FI graduates. Most research on L2 pronunciation has tended to focus on the non-native nature of students' accents when compared to native speakers' accents (Genesee, 1978; Hammerly, 1991; Netelenbos, 2013) or on the superior speaking capabilities of FI students when compared to those of students who have taken traditional FSL programs (Genesee, 1978). When CF, FI and PC program students have been compared, it was mostly to assess their reading and writing skills or other academic abilities (Genesee, 1978, Tatto, 1983). On the other hand, research that has looked at accent development has tended to focus on particular pre-existing cultural or ethnic groups (Giles & Johnson, 1981, 1987; Gumperz, 1982; Heller, 1982; Labov, 1978; Tajfel 1974, 1981).

Furthermore, this research contributes to the growing body of studies on L2 pronunciation in classrooms. Although Jesney carried out a comparative analysis of L2 phonetic studies between 1973 and 2003, she did not list studies on how English speakers mastered French pronunciation in schools. Birdsong (2004) did look at the longitudinal effects that living in a French environment had on the L2 pronunciation of late L1 English speakers. However, few other studies have examined the French pronunciation of L2 learners in a predominantly

Anglophone environment. One exception is Netelenbos (2013) who also indicated that there was a lack of research on FI pronunciation. Her study measured the voiced and voiceless VOTs for EI students in an elementary school, and compared their pronunciation to that of native speakers rather than to each other and other speakers.

The current study, therefore, focused on EI, LI, CF and PC graduates who volunteered to have their voices recorded. Listeners rated the strength of L2 FI accents in comparison to the accents of other high school French program graduates. The L2 and L1 speakers were evaluated on three tasks: a word delayed-repetition task (each with a different target sound), a sentence delayed-repetition task and an extemporaneous narration. Although all speakers were rated, there were too few PC and IF participants to provide sufficient data for statistical analyses. Therefore, these two groups were excluded from formal analyses.

This study also focused on whether or not it was possible for listeners to distinguish between FI and other French program peers by accent alone. This was determined with a program ID choice task (FI or CF) in which listeners based their program selection on the pronunciation of the previously rated words, sentences and narrations.

Lastly, after all ratings and program ID choice tasks were completed, acoustic measurements were made to establish which acoustic segments (if any) were different for the FI and CF accents. These were done by looking at /y, /u/ formant measurements and /t/ VOT measurements. The results of the ratings task will be discussed below under 5.1 and the program ID choice task under 5.2. Finally, 5.3 will discuss the VOT and formant analysis results.

## 5.1. Task 1: Ratings

### 5.1.1. Program-Related Differences in Accent Ratings

Because the FI program is thought to produce more competent (or at least more fluent) French speakers (Genesee, 1978) than other French language programs, it was expected that listeners might rate FI speakers more favourably than CF speakers. In fact, the results illustrated that single-word productions on their own were not always sufficient for listeners to distinguish between FI and other program groups, with the exception of *lundi* and *bureau*. In that case, only the EI group was significantly better than the CF group. In addition, EI and LI groups' ratings were never statistically different for word tokens.

The sentence rating and extemporaneous rating task results were significantly different between EI and CF groups. In particular, the EI group was rated significantly better for all three sentences than the CF group. In addition, the *S1* and *S4* results also showed that the LI group was rated as significantly better than the CF group. This appears to suggest that longer elicitations were needed for listeners to distinguish between degrees of accent among speaker groups from L2 French programs in this study. The narration rating results also showed that EI speakers were significantly better-rated than CF speakers, though no statistically significant difference was found between LI and CF speaker groups. These rating results presented an interesting development in that ratings for EI and LI speakers were almost never statistically different, apart from *S4* and the picture story (in which the CF and LI results were not statistically different). At the same time, EI speakers' ratings were significantly better than CF speakers' ratings in all cases. Taken together, these findings do not provide enough evidence in favor of a distinct accent for FI students vs. CF students. To obtain such evidence, very detailed phonetic analysis of all or most sounds would have to be conducted. As this study is exploratory, not all sounds were considered, though, as discussed below, VOT for the /t/ from *temps* was

examined and a formant analysis of the /y/ from bureau and the /u/ from coup was performed.

Additionally, when looking at degree of accent alone, there also seemed to be no difference between EI and LI groups despite the fact that EI students had spent more years learning French from elementary to high school (12 years for EI and 7 years for LI). The mean difference between the FI groups was low (0.68), suggesting again that listeners found it difficult to distinguish between the accents of the two groups. This may provide evidence that LI and EI speakers' accents sounded very similar to the listeners. This concurs with Netelenbos' (2013) study on FI VOTs, which found that the age at which learning started did not appear to be significant.

In contrast, other L2 speech research has shown that the length of experience with an L2 is sometimes tied to performance. For instance, a study of Mandarin and Slavic speakers over the course of 7 years found that Slavic speakers improved in all measured categories (comprehensibility, fluency and accent). Moreover, the speakers continued to improve during all the middle stages of examination (two months to two years to seven years, etc.) (Derwing, Munro & Saito 2013). This may have been due to their motivation to assimilate into their linguistic environment. In the present study, assimilation did not seem to be a factor in the case of FI speakers, as none of the speakers lived and completed their French program studies in a predominantly Francophone environment. Derwing, Munro and Saito (2013) likewise found that Mandarin speakers did not improve their pronunciation, partly perhaps because of the strong ties to their L1 community. There also appear to be social benefits for minority L1 speakers who do not improve their L2 pronunciation, Gatbonton et al. (2005) found that in cases where the minority group is large, some speakers choose to sound foreign to prevent appearing "less loyal" to their L1 community. Language is therefore sometimes a marker of group affiliation, and the FI students in this study may also have chosen to sound more similar to each other

to fit in with their “FI community”, rather than sound like either CF or PC speakers (who are both outsiders). This was indicated in a personal anecdote that one of the listeners presented during her rating task: she had found out that her son (a Francophone) had been “faking” an L2 French accent to avoid sounding different from his FI peers. It may be therefore be possible that pronunciation is also part of the “Immersion Identity”.

Another point of interest was that the listeners (who knew how many programs were represented by the speakers, but did not know the number of speakers in each program), always rated FI speakers as having a better pronunciation than CF speakers, but never rated FI speakers as though they were native speakers. However, it was also true that neither of the two speakers in the PC group were rated as having a fully native accent. Although their results were not formally analyzed, this is an intriguing point and merits further analysis. As BC is not a Francophone environment, it would be interesting to see how native French PC speakers compare to FI speakers, as the only places where PC students would be exposed to French would be at their schools (like FI) and in their homes. Other studies have compared FI speakers with native French speakers, but most of these studies were conducted in places with stronger Francophone communities, such as Ontario (Mougeon et al., 2004, 2010). Overall, it appears that the strength of FI students’ accents was being rated in terms of a comparison between native speakers and CF speakers (rated as foreign accented speakers). The within-group variance for sentence and narration tasks was also low, as indicated by significance testing, which demonstrated not only that the mean scores were different from speaker group to speaker group, but also that speakers ratings were very similar within each group. As was mentioned in Section 3.3.3., the 9-point scale was previously found to be a wide enough range for listeners to rate longer elicitations and to avoid ceiling effects (Jesney, 2004; Southwood & Flege 1999). Given that groups were rated so similarly, it stands to reason that their pronunciation at least varied

from FI to CF. However, it was not possible to establish all phonetic differences that underlay the distinction on the basis of accent ratings.

There is still another reason to argue for homogeneity among FI speakers. This study also found that FI students with French speaking parents (or parent) who spoke French at home were not rated as much more native sounding than their other FI peers. In fact one of these speakers was rated as more foreign than some L2 FI speakers with English speaking parents. Listeners were also not always able to identify FI speakers with francophone parents. In addition, not all FI speaker with French-speaking parents self-identified as Francophone, despite having French-speaking parents. This could illustrate the strength of relationships within the FI group, given that speakers who would be considered Francophone did not identify as such, and even sounded more like their FI peers.

## **5.2. Program ID Choice Task**

### **5.2.1. Listeners' Abilities to Identify Speakers' Programs**

The results of the Program ID Choice task (forced choice FI vs. CF) indicated that listeners could typically identify FI speakers separately from CF speakers. In general, it was found that the token word results were less accurate (but still significantly accurate in many cases), while sentences and the extemporaneous narration program ID choice results were the most accurate for all groups. In fact, eight of the 17 narrations were judges correctly 100% of the time. Although global accuracy was well above 50% accuracy for words, sentences and narrations, scores tended to be much lower for LI speakers than for EI speakers. Section 5.1.1, demonstrated that the rating differences for EI and LI were not statistically relevant, except for the ID choice results. In addition, there was considerable variability among listeners in their success on the

identification task, with one judge performing above chance on five of the seven test items, but another succeeding on only two.

In general, the EI and CF program ID choice task results showed that listeners could identify what program the speakers finished with moderate accuracy. This could simply be because FI students had more experience with French than CF students, and thus had more time to improve their accents. Another reason could be that no PC or IF speakers were included in this part of the study. If so, then in the program ID task, the listeners might have chosen FI for those speakers whose accents were more native and CF for speakers who sounded less native. In fact, the data from the rating tasks did indeed show better overall pronunciation ratings for the FI speakers than for the CF speakers. However, this was not the case for the accent ratings of *temps*, even though four of the five listeners were successful ( $\geq 69\%$ ) on the program ID task for that word. Given that outcome, another possible reason for the findings is that the listeners did not simply rely on the speakers' "degree of accent" in making their choices, but rather were able to detect particular accent features that distinguished the FI and CF speakers.

Interestingly, while the extemporaneous results discussed in 4.2.4 suggest that there was no statistical difference between the accent ratings of CF and LI speakers or between the ratings of EI and LI speakers, CF speakers were much more readily identified as being in the CF category for the Program ID Choice task than LI speakers were for the FI category. This could suggest that while listeners were capable of discerning which program speakers finished if the choice was between two categories, their discernment may not derive simply from pronunciation alone, but rather from a combination of grammatical, lexical (as was previously suggested in other works), and pronunciation differences. When these factors are combined, they help the listeners to identify the program that speakers finished. This was also suggested by some of the listeners upon completion of the listening tasks.

To continue, the results of the speakers' web surveys revealed that most FI students spent much more in-school time with their FI peers than with their English program peers and considerably more time with their FI peers outside of school. This concurs with the case study conducted by Courcy (2001), who found that FI students claimed to have closer relationships with their FI classmates than with English program peers. FI pronunciation could therefore be partly a result of group affiliation, which may lead speakers to imitate each other and develop a homogenised accent, as discussed under 5.1.1. Orr (2011) found anecdotal evidence that homogenised accents could occur when a common L2 was used as a tool for communication among different L1 speakers. Further anecdotal evidence from the web survey suggests that many listeners already believed that FI students had similar accents to each other, but not to either CF or PC students.

### **5.3. VOT and Formant Analysis**

As this study also focused on pinpointing some segmental features for FI students that could be used to distinguish them from CF students, VOT and formant analyses were performed for three token sounds from the word ratings task (/t/, /y/, /u/). These three sounds were selected because they were used in previous studies on French L2 pronunciation (Flege, 1987, 1991; Netelenbos, 2013).

#### **5.3.1. VOT for /t/**

VOT measurements for /t/ indicated no significant differences among the EI, LI and CF speaker groups. On the other hand, it is unclear how important VOT was for listeners. Even though VOT mean scores showed no statistical differences, listeners could still identify what program speakers had finished, even in the case of temps, as seen under section 4.3. This suggests that



listeners relied on something other than /t/ production for the program ID choice task. Another reason why listeners still correctly identified FI speakers in the program ID choice task may have been that a longer VOT for /t/ was not considered foreign. Caramazza et al. (1973) found that although VOTs were initially the same for voiced and voiceless consonants in French (from France) and Canadian French, “Canadian French” speakers (from Quebec in the study) had a significantly longer lag in VOT of /t/ than speakers from France due to “historic developments” such as heavy contact with English speakers. Furthermore, Caramazza et al. (1973) found that Canadian French lag-time was similar to Canadian English lag-time for voiced and voiceless consonants. Because listeners for this research were asked to consider all dialects of French as native, the longer VOT for /t/ for EI speakers might have been considered a Canadian French trait as opposed to a foreign sound. It is unknown whether or not EI speakers attempted to emulate Quebecois French – which would account for their longer VOT for /t/– or if the /t/ lag came from their L1 English. Irrespective of the reason for the observed VOT patterns, it is possible that FI students do not feel as though their accent represents any kind of stigma in society. FI speakers still live in a relatively English-speaking environment (certainly more so than Francophone speakers), and they are native or near-native speakers of a federally-endorsed dominant language (English). They have also been studying French for much longer and in a more intense setting than CF students (6 to 9 hours a week in high school for FI vs. 2 to 3 hours for CF), so their French proficiency is higher than that of other Anglophone L2 French learners. If this assumption is correct, FI students’ confidence in their spoken French may be higher than CF students’ confidence.

### **5.3.2. Formant Analysis for /u/ and /y/**

Formant frequencies from two vowels (/u/, /y/) were also analysed to see if significantly different formant productions could be found between FI and CF

speakers. Only the normalized (in terms of F3) F1 formant yielded a significant difference for /u/ for CF vs. FI. It was found quite consistently that FI speakers produced a more native French /u/ in terms of that dimension. However, listeners did not rate the /u/ from *coup*, so no further analysis could be carried out. Also, only female listeners were considered here because again, there were not enough male speaker participants to warrant formal analysis.

## **Chapter 6.**

### **CONCLUSION**

The present study focused on answering three questions related to the pronunciation of students in BC's FI program. This study's aim was to create more interest on this previously overlooked topic. The questions were: How do listeners rate the strength of L2 accents from FI in comparison to CF? Can L1 French listeners distinguish between FI and CF speakers based on this L2 accent alone? What segments, if any, make the FI accent different from the CF accent? In general, it was found that FI accents were rated as more native-like than CF accents and that listeners could indeed distinguish between FI and CF speakers. It was not possible, however, to draw definitive conclusions about the role of particular segments in the listeners' judgements. Because this research was exploratory, there is room for improvement should future researchers wish to further address similar questions. The following sections detail recommendations for improving the various tasks and analysis involved in this study.

#### **6.1.1. Ratings: Some Comments on Procedure and Suggested Improvements for Future Research**

Because this research was exploratory, many issues arose during the data collection phase of this investigation with respect to ratings. Re-examining the procedure and the results revealed that one of the first recommended changes would be to equalize the number of speakers from each French program group. In this study, the lack of sufficient PC speakers made it difficult to conduct a proper cross-program examination, as these speakers' results lacked statistical significance and had to be excluded from the analysis. The desired

change could be achieved by being granted access to BC high schools and recording an equal number of CF, FI and PC students – perhaps even whole classes – and then comparing ratings. This way, PC students' accents could be compared to FI accents to see if the FI ratings really fall in the middle of the 9-point scale. This could better help to confirm or disconfirm whether FI speakers' accents are rated differently from all other French program accents in BC.

Secondly, listeners could rate a greater number of words representing a larger number of target sounds. In this study, ten words with ten token sounds were recorded, but only 3 of them were selected for ratings and program ID choice tasks. When performing the formant analysis for /u/ from the token word *coup*, it was not possible to analyse the formants with respect to the rating results, as the /u/ sound had not been rated. On the other hand, the /t/ VOT rating scores did not differ significantly between French program groups. Therefore, only the /y/ could be analysed. This would be easy to correct, should this study be replicated or expanded, as the corpus remains accessible and the rating task can be set up again without having to bring in new speakers. (A new set of listeners would have to be called in again to perform for ratings.)

The recommendations for improving the elicitation procedure for the sentence rating task are two-fold: firstly, it would be important to be completely sure that all productions are completely identical in grammar and content, so that the only difference between speakers would be their accents. During the recording of the delayed repetition tasks, some speakers had trouble remembering or understanding the sentences even after multiple playbacks. Although this occasionally happened to FI speakers, it was more common among CF speakers. This could be another explanation for why FI speakers were rated as better than CF speakers. Secondly, it was noted that during the extemporaneous speech, listeners took varying amounts of time evaluating speakers' sentences. For future studies, it might be interesting to see the amount of time it takes listeners to evaluate each speaker.

Finally, with respect to the extemporaneous narration task, pronunciation was not the only element listeners could pay attention to when rating speakers. Other elements could be morphosyntactic and lexical errors (McDermott, 1986). It should also be noted that although listeners were advised to rate speakers on pronunciation alone for all three tasks, they may not have always done so. In fact, many listeners said that the narration was the easiest task to rate, as they were familiar with the mistakes or linguistic mannerisms of FI and CF students.

### **6.1.2. Program ID Choice Task: Some Comments on Procedure and Suggested Improvements for Future Research**

As is the case for the ratings task, some modifications and clarifications are recommended for the program ID choice task. First, the choice task used in this study was not performed at the same time as the ratings task. During the first attempt listeners were instructed to rate and select what program they thought the speakers had finished. Because originally there were also IF students and PC speakers to choose from, many listeners found that this choice task was too difficult. One listener chose not to perform it because that individual had the least experience with Canadian French programs. Other listeners reported that they did not know what to look for when making selections for the program choice task because they had less experience with PC and IF students than with CF or FI students. It would have been better to use listeners who had more experience with all these French programs, or to have assigned the choice task only to FI and CF speakers to begin with.

Additionally, as was mentioned before, the number of IF and PC speakers were too few to be analysed, so they were excluded from formal analyses. After some discussion, a decision was made to call back all listeners (six from seven) who had experience with at least CF and FI programs. The sixth listener was out of the country, so in the end, five listeners returned to perform the new choice task. This program ID choice was now a two-answer forced-choice task in which

EI and LI were grouped together under one category FI. The reason for this change was that the rating results indicated no significant difference between EI and LI speakers. The time difference between when the rating and the program ID choice tasks were performed might have had an effect on the results, although listeners were given the exact same stimuli as before. If this study was expanded to investigate high school students, it would be possible to use instructors who teach FI, CF or PC as expert listeners.

### **6.1.3. Recommendations for VOT and Formant Analysis**

With respect to the specific phonemes associated with FI, this study has shown that the sentence results for both the rating and program ID choice tasks yielded the most significantly different results between CF and FI speaker groups. It can be argued that it is groups and combinations of sounds, rather than isolated phonemes, that produce the recognizable phonetic, and possibly prosodic, characteristics of the FI student accent. Prosody was not looked at in this research, and researchers might include it in future studies. On the other hand, it was possible to clearly identify what program the CF, EI and LI speakers finished. Since the ratings of FI students' accents were more similar on a scale of 1-9 to each other than to CF speakers' ratings, it is possible to surmise that some accent characteristics do exist, though this study provides inconclusive evidence regarding the matter. Further research is required to obtain a more conclusive answer to this study's last question.

### **6.1.4. Final Thoughts in FI Accents**

Overall, the results of this research indicated that native-French listeners could distinguish FI speakers from CF speakers and could rate the two groups' differently. In general, longer utterances provided the most accurate results. Although the research analysed only a portion of the recorded words and sentences, the results are an important step toward identifying FI accents as

distinct from other L2 French accents. However, further research needs to be conducted on FI accents (such as comparing FI accents to PC accents) in order to better determine if the FI program produces a distinct accent. This very intriguing question remains largely unsolved, although the present study provides the beginning of an answer. I hope this study will generate greater interest in FI accents and FI group affiliation in the future.

FI remains popular in Anglophone provinces, where it has garnered praise for its ability to foster English-French bilingualism and criticism for its apparent elitism and failure to provide students with native-like proficiency. The study thus had a different focus than determining which program was “better” or “worse” in terms of language acquisition.

As for myself, this study has opened up new questions in regards to FI pronunciation such as: when during the elementary and high school years does FI pronunciation start to develop, or stagnate?; do accents differ from one school to the other?; should pronunciation be specifically taught and graded in schools?; and are FI speakers aware of any similarities amongst their own accents? Netelenbos (2013) already found that voiced and voiceless stops stagnate among EI students even after grade 1, and anecdotal evidence has suggested that FI students can even pinpoint what FI school their peers attended based on lexicon. In short, the FI microcosm presents, in my mind, an endless source of linguistic and pedagogical fascination, and if this research has raised more questions than it answered, then it has fulfilled its purpose. I can only hope this study will spark the interest of more researchers in the future, and though it is certain that I will continue to research this topic, I look forward to reading all further research on this brand of “Immersionese” in the future.

## References

- Abdelilah-Bauer, B. (2008). Le bilinguisme tardif. *Le défi des enfants bilingues* (pp. 111-121). Paris: La découverte.
- Abdelilah-Bauer, B. (2008). De la naissance à 3 ans, le bilinguisme précoce simultané. *Le défi des enfants bilingues* (1st ed., pp. 70-81). Paris: La découverte.
- Abercrombie, D. (1956). *Problems and Principles: Studies in the Teaching of English as a Second Language*. Green and Co.
- Abramson, A., & Lisker, L. (1973). Voice timing perception in Spanish word-initial stops. *Journal of Phonetics*. 1. 1-8
- AudaCity (2014). <http://audacity.sourceforge.net/>
- Baker, C. (2000). *A parents' and teachers' guide to bilingualism*. (2nd ed.). Clevedon, UK: Multilingual Matters.
- BC Ministry of Education. French immersion program policy. Retrieved 10/14/2013, 2013, from <http://www2.gov.bc.ca/gov/topic.page?id=DCBD126F605646F7B16D62E5D09CD289>
- Bernstein, B. (2013). Languages and social class. *The British Journal of Sociology*, 11(3), 11/07/2013.
- Birdsong, D. (2003). Authenticité de prononciation en français L2 chez des apprenants tardifs anglophones: analyses segmentales et globales. *Acquisition et interaction en langue étrangère*, 18, 31 October 2013.
- Birdsong, D. (2007). Nativelike pronunciation among late learners of French as a second language. In O-S Bohn, & M. J. Munro (Eds.), *Language experience in second language speech learning: In honor of James Emil Flege* (Bohn, O-S; Munro, M. J. ed., pp. 99-116). Amsterdam: John Benjamins Publishing Company.



- Boersma, P, Weenink, D. (2014). Praat: doing phonetics by computer.  
<http://praat.org>
- Bongaerts, T., Planken, B., & Schils, E., (1995). Can late learners attain a native accent in a foreign language? A test of the critical period hypothesis. In D. Singleton & Lengyel (Eds.), *The age factor in second language acquisition*. 30-50. Clevedon, UK: Multilingual Matters.
- Boursin, J.-L., Filiolet, C., & Vandendriessche, A. (2010). *La phonétique par les textes*. Eds. Belin.
- Brière, E. J. (1966). An investigation of phonological interference. *Language*, 42. 768-796.
- Canadian Parents for French. (2012). Voices of new Canadians: Fact sheet for educators. (Public). 421-428.
- Canadian Parents for French. (2013). French immersion celebration week 2013. Retrieved 05/31, 2013, from [www.cfp.bc.ca/site3/index.php/events/french-celebration-week](http://www.cfp.bc.ca/site3/index.php/events/french-celebration-week)
- Caramazza, A., Yeni-Komshian, G. H., Zurif, E. B. & Carbone, E. (1973) The acquisition of a new phonological contrast: The case of stop consonants in French-English bilinguals. *The Journal of the Acoustical Society of America*. 54
- Courcy, M. (2001). *Learners experiences of immersion education: Case studies of French and Chinese*. Clevedon, GBR: Multilingual Matters.
- Courcy, M., Warren, J., & Burston, M. (2002). Children from diverse backgrounds in an immersion programme. *Language and Education*, 16(2), 112-127. doi:10.1080/09500780208666823
- Cox, T. (1998). Vers une norme pour un cours de phonétique française au Canada. *Canadian Modern Language Review*, 54(2), 172-172.
- Crystal, D. (2008). *A Dictionary of Linguistics and Phonetics (6<sup>th</sup> Ed.)*. Malden, Massachusetts. Blackwell Publishing Ltd.
- Dalbor, J. (1980). *Spanish Pronunciation* (Holt, Rinehart, and Winston, New York).

- Derwing, T. M., Munro, M. J., & Thomson, R. I., (2007). A Longitudinal study of the ESL learners' fluency and comprehensibility development. *Applied Linguistics*. 29(3). 359-380.
- Flege, J. E. (1984). The detection of French accent by American listeners. *Journal of the Acoustical Society of America*. 76(3). 692-707
- Flege, J. E. (1987). The production of "new" and "similar" phones in a foreign language: Evidence for the effect of equivalence classification. *Journal of Phonetics*, 15, 47-65.
- Flege, J. E. (1991). Age of learning affects the authenticity of voice-onset time (VOT) in stop consonants produced in a second language. *The Journal of the Acoustical Society of America*, 89(1), 395. doi: <http://dx.doi.org.proxy.lib.sfu.ca/10.1121/1.400473>
- Flege, J. E. (1995). Second language speech learning theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 232-277) York Press.
- Flege, J. E., & Hillenbrand, J. (1984). Limits of phonetic accuracy in foreign language speech production. *Journal of the Acoustical Society of America*, 76(3). 708-721.
- Flege, J. E., & Eefting, W. (1986). Linguistic and developmental effects on the production and perception of stop consonants. *Phonetica*. 43. 155-171.
- Flege, J. E., Munro, M. J., & MacKay, I. R. A. (1995). Factors affecting strength of perceived foreign accent in a second language. *Journal of the Acoustic Society of America (JASA)*. 97(5). 3125-3134.
- Friesen, J. (2013, Jan. 28). French immersion enrolment skyrockets as a new linguistic category emerges. Retrieved from: <http://www.theglobeandmail.com/news/national/education/French-immersion-enrolment-skyrockets-as-a-new-linguistic-categoryemerges/article7935100/?page=all>
- Gardner, R. & Tremblay, P. (1994). On motivation, research agendas and theoretical frameworks. *Modern Language Journal*. 81. 344-362.
- Gatbonton, E., Trofimovich, P., & Magid, M. (2005). Learners' ethnic group affiliation and L2 pronunciation accuracy: a sociolinguistic investigation. *TESOL Quarterly*. 39(3). 489-511.

- Genesee, F. (1978). A longitudinal evaluation of an early immersion school program. *Canadian Journal of Education / Revue Canadienne De l'Éducation*, 3(4), 31-50. doi:10.2307/1494684
- Genesee, F. (1987). *Learning Through Two Languages : Studies of Immersion and Bilingual Education*. Eds. Cambridge, MA: Newbury House Publishers.
- Genesee, F. (2007). French immersion and at-risk students: A review of research evidence. *Canadian Modern Language Review*, 63(5), 2013/06/01. 655-687.
- Giles, H., & Johnson, P. (1981). The role of language in ethnic formation. In J. C. Turner & Giles (Eds.), *Intergroup behaviour* (pp. 199-243). Oxford: Basil Blackwell.
- Giles, H. & Johnson, P. (1987). Ethnolinguistic identify theory: A social psychological approach to language maintenance. *International Journal of the Sociology of Language*, 68 69-99.
- Gumperz, J. J. (1982). *Discourse strategies*. Cambridge University Press.
- Hammerly, H. (1989). *French immersion: Myths and reality*. Calgary: Detselig Enterprises Ltd.
- Hansen, J. G., & Liu, J. (1997). Social identity and language: *Theoretical and methodological issues*. *TESOL Quarterly*, 31(3), 567. doi:10.2307/3587839
- Hart, D., & Lapkin, S. (1998). Issues of social-class bias in access to French immersion education. In S. Lapkin (Ed.). *French second language education in Canada: Empirical studies*. Toronto, ON: University of Toronto Press
- Heller, M. (1982). Language, ethnicity and politics in Québec. Unpublished doctoral dissertation, University of California, Berkley.
- Huang, R., Hansen, J. H. L., & Angkititrakul, P. (2007). Dialect/Accent classification using unrestricted audio. *Audio, Speech, and Language Processing*, 15(2), 453-464. doi:10.1109/TASL.2006.881695
- Jesney, K. (2004). The use of global foreign accent rating in studies of L2 acquisition. University of Calgary Language Research Centre Reports,

- Jones, D. (1960). *An outline of English phonetics: 9<sup>th</sup> Edition*. Ed Heffer.
- Labov, W. (1978). *Le parler ordinaire: La langue dans les ghettos noirs des États-Unis* (A. Kihm Trans.). (1st ed.). Paris, France: Éditions de Minuit.
- Lapkin, S., Swain, M., & Argue, V. (1983). *French immersion: The trial balloon that flew*. Toronto: OISE Press.
- Lazaruk, W. (2007). Linguistic, academic, and cognitive benefits of French immersion. *Canadian Modern Language Review*, 63(5), 2013/05/31.
- Lewis, C. C. (1986). *Secondary French immersion: A comparison of those students who leave the program and those who stay*. (Unpublished Masters Thesis). Simon Fraser University.
- Lippi-Green, R. (1994). Accent, standard language ideology, and discriminatory pretext in the courts. *Language in Society*, 23(2), 162-165.  
doi:<http://www.jstor.org.proxy.lib.sfu.ca/stable/4168513?seq=3>
- Lippi-Green, R. (1997). *English with an accent: Language, Ideology, and discrimination in the United States*. Psychology Press.
- Lippi-Green, R. (2012). *English with an Accent Language, Ideology and Discrimination in the United States*. Routledge (2<sup>nd</sup> Ed.), NY.
- Lenneberg, E.H. (1967). *Biological foundations of language*. New York, Wiley.
- Lyster, R. (1987). Speaking immersion. *Canadian Modern Language Review*, 43(4), 701-717.
- McDermott, W.L. Calla. (1986). *The Scalability of Degrees of Foreign Accent*. Ph.D. Dissertation. Cornell University, Ithaca, NY.
- Mougeon, R., Nadasdi, T., & Rehner, K. (2010). The sociolinguistic competence of immersion students. Salisbury: *Multilingual Matters*.
- Mougeon, R., Rehner, K., & Nadasdi, T. (2004). The learning of spoken French variation by immersion students from Toronto, Canada. *Journal of Sociolinguistics*, 8(3), 408.
- Moyer, A. (2004). Age, accent, and experience in second language acquisition: an integrated approach to critical period inquiry (No. 7). *Multilingual Matters*. 40.

- Munro, M. J. (1998). The effects of noise on the intelligibility of foreign-accented speech. *Studies in Second Language Acquisition*, 20, 139-154.
- Munro, M. J., Derwing, T. M., & Flege, J. E. (1999). Canadians in Alabama: A perceptual study of dialect acquisition in adults. *Journal of Phonetics*, 27, 385. doi:10.1006/jpho.1999.0101
- Munro, M. J., Derwing, T. M., & Saito, K. (2013). English L2 vowel acquisition over seven years. In J. Levis & K. LeVelle (Eds.). *Proceedings of the 4th Pronunciation in Second Language Learning and Teaching Conference, Aug. 2012*. (pp. 112-119). Ames, IA: Iowa State University.
- Netelenbos, N. (2013). The development of voice onset time in French immersion children. (Unpublished Masters). University of Lethbridge, Lethbridge, Alberta.
- Orr, R.; Quené, H.; Beek, R.; Diefenbach, T.; Leeuwan, D.; & Huijbregts, M. (2011). An International English Speech Corpus for Longitudinal Study of Accent Development, *Interspeech*, 1880-1892.
- Oyama, S., 1976. A sensitive period for the acquisition of a non-native phonological system. *Journal of Psycholinguistic Research* 5 (3), 261-283.
- Peal, E., & Lambert, W. E. (1962). The relation of bilingualism to intelligence. *Psychological Monographs*, 76 (27), 1-23.
- Pemberton, K. (2013,). More French teachers needed in B.C.: report *Vancouver Sun*. April 11 2013
- Piske, T., MacKay, I. R. A., & Flege, J. E. (2001). Factors affecting degree of foreign accent in an L2: A review. *Journal of Phonetics*, 29, 191-215.
- Rehner, K., & Mougeon, R. (1999). Variation in the spoken French of immersion students: To ne or not to ne, that is the sociolinguistic question. *Canadian Modern Language Review*, 56(1), 124.
- Southwood, M. H., & Flege, E. J. (1999). Scaling Foreign Accent: Direct Magnitude Estimation versus Interval Scaling. *Clinical Linguistics and Phonetics*. 13(5), 335-349.
- Spencer, J. (1958). Received pronunciation: Some problems of interpretation. *Lingua*, 7, 7-29. doi:10.1016/0024-3841(57)90064-5

- Statistics Canada. (2008). French immersion 30 years later. Retrieved 26/05, 2013, from [www.statcan.gc.ca/pub/81-004-x/200406/6923-eng.htm#d](http://www.statcan.gc.ca/pub/81-004-x/200406/6923-eng.htm#d)
- Swain, M., Lapkin, S., & Hart, D. (1990). The role of mother tongue literacy in third language learning. *Vox*, 4, 111-121.
- Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science in social Information*. 13, 65-93.
- Tajfel, H. (1981). *Human groups and social categories: Studies in social psychology*. Cambridge: Cambridge University Press.
- Tatto Mabel, A. (1983). A comparative analysis of grammatical errors in the written code between grade eleven immersion French and grade eleven core French. (Unpublished Master of Arts Teaching of French). Simon Fraser University, Burnaby.
- Uritescu, D., Mougeon, R., & Handouleh, Y. (2002). Le comportement du schwa dans le français parlé par les élèves des programmes d'immersion française. *La linguistique fonctionnelle au tournant du siècle. Actes du 24e colloque international de linguistique fonctionnelle* (pp. 335-346). Toronto, Ontario: GREF.
- Wente, M. (2013, 5th of February). Why is French immersion so popular. *The Globe and Mail*
- Williams, L. (1977 a). The voicing contrast in Spanish. *J. Phon.* 5. 169-185.
- Williams, L. (1980). Phonetic variation as a function of second language learning. *Child Phycology Vol. 2 Perception*. Eds. G. Yeni-Komshian, J. Kavanagh, C. Ferguson (Academic, New York). 185-216.

## Appendix A.

### Web Survey Questions

#### Speaker Questions

##### Q1 . Listener Code

##### Q2 . Year of birth (indicate only the year)

##### Q3 . Choose your sex.

- Male
- Female
- Other

##### Q4 . What is your place of birth? (City and country)

##### Q5 . What is/are your native language(s)?

##### Q6 . What is/are your parents' native language(s)?

##### Q7 . Year of high school graduation (indicate only the year)

Three empty dropdown menus for data entry.

**Q8 . In what city did you graduate? (Please add the country, if not Canada)**

A large empty text input field with a vertical scrollbar on the right and horizontal scrollbars at the bottom.

**Q9 . Do you consider yourself Francophone?**

- Yes
- No

**Q10 . When you completed high school, you also finished:**

- Core French (FSL)
- Early Immersion
- Late Immersion
- Programme Cadre (francophone school)
- IF (Intensive French)
- None of these

**Q11 . If you answered Early or Late Immersion, how much time did you spend with your Immersion peers IN SCHOOL relative to with your English program peers?**

- I spent much less time with my French Immersion peers than with my English program peers.
- I spent a little less time with my French Immersion peers than with my English program peers.
- I spent an equal amount of time with my French Immersion peers as with my English program peers.
- I spent a little more time with my French Immersion peers than with my English program peers.
- I spent much more time with my French Immersion peers than with my English program peers.



- N/A

**Q12 . If you answered Early or Late Immersion, how much time did you spend with your Immersion peers OUTSIDE OF SCHOOL relative to with your English program peers?**

- I spent much less time with my French Immersion peers than with my English program peers.
- I spent a little less time with my French Immersion peers than with my English program peers.
- I spent an equal amount of time with my French Immersion peers as with my English program peers.
- I spent a little more time with my French Immersion peers than with my English program peers.
- I spent much more time with my French Immersion peers than with my English program peers.
- N/A

**Q13 . Did you at any point during your elementary or high school years, live in, or, participate in an exchange in a francophone community outside of BC?**

- Yes
- No

**Q14 . If yes, how long was your exchange/stay?**

- Less than 6 months
- 6 months
- 6 months -1 year
- 1 year
- More than 1 year
- N/A

**Q15 . On a scale of 1 (least proficient) to 7 (most proficient), how proficient is your oral English?**

**1 (least) 2 3 4 5 6 7 (most)**

Answer :

**Q16 . On a scale of 1 (least proficient) to 7 (most proficient), how proficient is your oral French?**

1 (least) 2 3 4 5 6 7 (most)

Answer :

**Q17 . On a scale of 1 (rarely) to 7 (very often), how often do you use French outside of the University/school setting??**

1 (rarely) 2 3 4 5 6 7 (very often)

Answer :

**Q18 . Besides the Standard French Accent, on a scale of 1 (little or no exposure) to 7 (very exposed), how much exposure did you have to other accents/dialects of French IN the school setting?**

1 (no exposure) 2 3 4 5 6 7 (very exposed)

Answer :

**Q19 . Besides the Standard French Accent, on a scale of 1 (little or no exposure) to 7 (very exposed), how much exposure did you have to other accents/dialects of French OUTSIDE the school setting?**

1 (no exposure) 2 3 4 5 6 7 (very exposed)

Answer :

**Q20 . On a scale of 1 (little importance) to 7 (very important), how important for you, is pronunciation for language proficiency?**

1 (little importance) 2 3 4 5 6 7 (very important)

Answer :

**Q21 . On a scale of 1 (little importance) to 7 (very important), how important for you, is PERCEPTION of pronunciation for language proficiency?**

1 (little 2 3 4 5 6 7 (very

importance)

important)

Answer :

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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**Q22 . If there is ONE thing that I could improve about my French speaking skills, it would be:**

- My grammatical accuracy
- My lexical knowledge (vocabulary)
- My pronunciation
- Other

**Listener Questions**

**Q1 . Listener Code**


\*

**Q2 . Gender.**

- M
- F

**Q3 . Year of Birth.**

Answer :

**Q4 . Place of birth.**


\*

**Q5 . My mother tongue is:**

**Q6 . Other places you have lived for more than 1 year.**

**Q7 . Are you familiar with the French language programs offered in BC?**

- Yes
- No

**Q8 . On a scale of 1 (least familiar) to 5 (most familiar) how familiar are you with the various French programs in BC?**

1 (least familiar)   2   3   4   5 (most familiar)

Answer :

**Q9 . Check off all the French programs that you have heard of in BC.**

- Core French/FSL
- Early French Immersion
- Late French Immersion
- Programme Cadre/Programme francophone
- Intensive French/IB French

**Q10 . On a scale of 1 (least) to 7 (most), rate your English language proficiency.**

1 (least)   2   3   4   5   6   7 (most)

Answer :

**Q11 . On a scale of 1 (least) to 7 (most), rate your French language proficiency.**

1 (least)   2   3   4   5   6   7 (most)



## Appendix B.

### Speakers' Self-Proficiency Ratings and Importance of Pronunciation

Type of Program	Self-professed Ratings from 1 (least) to 7 (most)	Importance of French Pronunciation from 1(least) to 7 (most)
Core French	4	7
Early Immersion	6	7
Early Immersion	5	7
Intensive French	3	7
Late Immersion	4	7
Core French	2	6
Core French	4	6
Early Immersion	3	6
Early Immersion	5	6
Early Immersion	6	6
Early Immersion	5	6
Late Immersion	4	6
Late Immersion	5	6
Programme Cadre	6	6
Core French	4	5
Core French	4	5
Early Immersion	4	5
Programme Cadre	4	5
Late Immersion	5	4
Core French	3	3