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Canadian anglophone learners' realization of French liaison

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Cet article examine la réalisation de la liaison dans un corpus de douze locuteurs canadiens anglophones de la province de l'Ontario dans trois tâches: lecture, entrevue et discussion. Le taux général de liaisons approche celui des locuteurs natifs dans la parole spontanée, mais est plus bas pour la lecture à voix haute. Les liaisons catégoriques sont plus fréquentes en parole spontanée qu'en lecture et chez les locuteurs qui ont bénéficié d'une expérience d'immersion. Les liaisons variables ne varient ni en fonction de la tâche ni en fonction du niveau d'études du français ou des expériences d'immersion. Les liaisons erratiques sont très rares, apparaissant surtout dans la tâche de lecture. On observe le non-enchaînement dans 7.2% des liaisons, ce taux diminuant avec plus d'années d'études du français. Les erreurs de substitution des consonnes de liaison, observées notamment pour les liaisons variables et erratiques, et dans la lecture à haute voix, sont peu fréquentes. Les résultats suggèrent que ces locuteurs, à un niveau intermédiaire ou avancé, ont acquis l'essentiel de la liaison dans leur français L2, tout en montrant des divergences par rapport aux locuteurs natifs.

Mots-clés:

français, liaison, anglais, anglophone, langue seconde, Ontario, Canada.

1. Introduction¹

French liaison realization by Anglophone learners in the Canadian province of Ontario has been documented in a number of previous studies (Mastromonaco 1999; Thomas 2002, 2004; De Moras 2011). With the current study, using data from the *Projet Interphonologie du Français Contemporain* (IPFC) Canadian English corpus (Tennant, Shapiro & Taylor 2010), we propose to take a closer look at liaison in this population, applying a common protocol used in IPFC studies on speakers with other L1s (Detey & Kawaguchi 2008; Racine, Detey, Zay & Kawaguchi 2012; Racine & Detey this volume). The accumulated findings of these studies will shed further light on the nature of French L2 liaison acquisition, in order to address questions such as whether liaison is a lexically driven process based on written input for L2 learners, or whether morphophonological generalizations also play a role (Wauquier 2009).

It can be argued that French as an L2 in Canada, and particularly in Ontario, has a different status from elsewhere in the English-speaking world. While it is clear that English is Ontario's demographically dominant language, official bilingualism at a national level, in addition to the presence of a Francophone

¹ The author wishes to acknowledge here the contribution of Jade (Shapiro) Bloom and Nerissa Taylor in gathering, transcribing, and coding the IPFC anglais canadien corpus, as well as the two anonymous reviewers for their comments.

population that is the largest outside Quebec in terms of sheer numbers (561,160 who declare French as sole mother tongue or one of their mother tongues) (Statistics Canada 2012), if not in proportion of the overall population (4.4 per cent), creates a situation in which Ontarians having English (or another language) as their L1 benefit from at least occasional exposure to French. It should be noted as well that all Ontarians who have been schooled in the province in recent years have spent at least six years learning the basics of the language.

In this paper, we examine liaison in a corpus of university-level Anglophone learners of French. Following the IPFC protocol (Racine et al. 2012; see also Racine & Detey this volume), we take into account overall liaison realization, as well as categories of liaison (obligatory or categorical, optional or variable, erratic or prohibited), in addition to the presence or absence of enchaînement and whether or not the target liaison consonant is accurately pronounced. We also consider possible effects of biographic factors: learners' level of language study (in first or fourth year of university), the elementary and secondary school program in which they first learned French (regular "core" French vs. intensive French "immersion"), and whether or not they have had an extended study abroad experience in a French-speaking area.

2. Previous Studies

The research on French liaison is extensive and it would go beyond the scope of this article to review it all. There is little controversy regarding the descriptive definition of the phenomenon as a consonant that is pronounced between two words, word1 and word2, when word2 begins with a vowel, and under specific linguistic and stylistic conditions, as in 'les opposants' [lezɔpozɑ̃], but not pronounced when word2 begins with a consonant, as in 'les manifestations' [lemanifestasjɔ̃]. There has, however, been considerable debate on the exact nature of the process, and what theoretical model best accounts for it. The following section will only touch on the highlights of research on liaison, with a focus on what is most relevant to the current study. The reader may refer to Racine & Detey (this volume) for a more thorough literature review.

2.1 *Liaison in French L1*

Mallet (2008) and Côté (2011) provide recent comprehensive reviews of the literature on liaison, giving a diachronic account of the evolution of the phenomenon itself as arising from the weakening and deletion of final consonants, as well as a historical overview of linguistic study of liaison. Delattre's (1947) taxonomy of obligatory, optional and forbidden liaisons has been very influential, forming the basis for numerous studies and teaching approaches. As Mallet (2008) notes, a less prescriptive terminology is often preferred for the categories (e.g. categorical, variable and erratic liaisons). Durand & Lyche (2008) note that liaison has been a testing ground for several

phonological theories, starting with Schane's (1968) truncation analysis, which has been criticized by Laks (2005) for the lack of correspondence between its empirical basis and the reality of spoken French. Encrevé (1988) surveys theoretical analyses of liaison and emphasizes occasional occurrence of liaison without enchaînement in his study of French politicians' speeches. Encrevé's autosegmental account represents the liaison consonant as a floating coda element that attaches to a null onset. Morin & Kaye (1982) propose a suppletion account, while Côté (2005) argues for an epenthesis model. A number of recent studies based on data from the PFC project, drawing on empirical evidence from a large database of spontaneous and read speech, have advocated a multidimensional perspective, emphasizing the role of frequency and the extent to which liaison is lexically driven: Mallet (2008), Durand & Lyche (2008), Durand, Laks, Calderone & Tchobanov (2011), Barreca & Christodoulides (2015), to give only a few examples. For a more thorough review of the literature on liaison in French L1, see Racine & Detey (this volume).

Finally, it is worth noting here that, while the Laurentian French variety to which Ontario Anglophones are exposed does tend, as Côté (2012: 261) notes, to *"obey the main rules and tendencies observed elsewhere"* with respect to liaison, it does present a few particularities (van Ameringen and Cedergren 1981; Côté 2012): liaison with /t/ in 'je suis' and 'tu es', omission of liaison in 'ils', variable liaison with 'on', liaison // following 'ça', among others.

2.2 Liaison in French L2

Liaison in French L2 has attracted the attention of a growing number of researchers in recent years, as can be seen in reviews of the literature in Hannahs (2007) and Wauquier & Shoemaker (2013), with studies focusing on its acquisition by native speakers of a variety of European and Asian languages. Harnois-Delpiano, Cavalla & Chevrot (2012) combine production and judgement tasks in an experimental study on Korean learners, pointing out the influence of the written form on accuracy of liaison realization. A number of recent studies have been conducted using data from the IPFC project. Racine & Detey (2012) show that Spanish L1 speakers have a higher rate of liaison in the reading task than do Japanese L1 speakers, but make more liaison consonant substitution errors and have more liaisons without enchaînement than do Japanese learners. For Italian, Murano & Paternostro (2012) draw on data from IPFC Italian (Milan) showing overall rates in the reading task of 61% for obligatory liaisons and 4% for optional liaisons, as well as particular difficulties Italian learners encounter with final consonants. Barreca & Floquet (2015) address questions relating to the nature of liaison L2 acquisition in IPFC Italian (Rome), drawing on Wauquier's (2009) hypothesis that L2 learners acquire liaison based on orthographic representation of words, whereas liaison is acquired in L1 French by means of morphophonological

generalizations based on the input. Based on a typology of L2 liaison realizations in their corpus as performance errors, erroneous variant selection, phonological generalization, or morphophonological generalization, the authors argue that, while learners do use lexical strategies, they are not limited to case-by-case treatment of liaison, but rather they develop morphophonological generalizations. The reader is referred to other articles in this volume for further IPFC analyses of liaison.

A number of studies have examined liaison usage by Anglophone learners of French. Mastromonaco's (1999) doctoral dissertation examined liaison in two groups of second-year university students in an English-language university. Realization of liaisons was analyzed according to Delattre's (1947) categorization in three speaking styles: reading aloud, spontaneous speech and a description task. Obligatory liaisons were realized in 94% of occurrences, with those not pronounced being mostly in the context of DET + N and *c'est* + _____. Liaison consonants in "forbidden" contexts were pronounced in 4% of occurrences, primarily after <n> in nouns, following the conjunction "et", and before aspirated h. Mastromonaco observed that only 14% of optional liaisons were realized, mainly after verbs such as 'être' and 'devoir', as well as following 'pas' and 'quand'. Her learners made few "false" liaisons (pronunciation of a consonant other than the underlying consonant, or insertion of a consonant when there is no underlying consonant), and 93% of their liaison consonants had enchaînement. Thomas (1998) calls for the teaching of liaison in French as a second language to be better aligned with actual usage and in his studies of the advanced French interlanguage of Canadian Anglophones (Thomas 2002, 2004), he analyses liaison among other pronunciation variables. Thomas notes a rate of 91.1% for obligatory liaisons and lower rates of optional liaisons than Francophones (e.g. 66.2% following 'est', as opposed to Ågren's (1973) 97% figure for L1). He observes that *"liaison accounts for nearly 20% of the phonetic errors made by students"* (2004: 368) and that that /d/ is often substituted for liaisons in /t/, suggesting a difficulty in choosing the right liaison consonant *"when it deviates from the dominant model of close correspondence between writing and speech."* (2004: 368) He also finds that *"8.5% of correct liaisons were realized without proper enchaînement."* (2004: 368) Howard (2005) also uses Delattre's classification, and finds that Irish Anglophone learners with who have studied abroad have significantly higher rates of both obligatory (95%) and variable (12.7%) liaisons than those who have not (obligatory 82.2%, variable 8.2%). De Moras (2011) focuses on a wider range of liaison contexts than in these three other studies, using a reading task to observe liaison production by university-level students and taking into account the effect of word1 and word2 frequency. In addition, using a pre-test and post-test design, she evaluates the effect of different instructional approaches to teaching liaison. Due to the wide range of contexts included in the reading task, De Moras observed a much lower rate of

obligatory liaison production than in other studies: 60.7%. She found that this rate increased to 69.5% in the post-test following instruction, and that learners who did repetition exercises as part of the instruction made greater progress than those for whom instruction was only in the form of theoretical explanations of liaison.

This brief and admittedly selective overview of research on L2 acquisition of liaison has shown that a growing body of comparative empirical data is being developed, which will help advance knowledge of how this often-studied French sandhi phenomenon is acquired in French as a second language.

3. Corpus and Method

Before describing the methodology used for gathering the corpus that served as a source of data on L2 liaison for this study, it is important to look at how French is acquired as a second language in Ontario, a majority English-speaking province within a federation that has both English and French as official languages. It must be borne in mind that, although Francophones may be a minority in Ontario, Franco-Ontarians are the largest French-speaking provincial minority outside of Quebec. In addition, the level of local demographic concentration of Francophones varies from one locality to another, with majority status in a few locations (e.g. Hearst, Hawkesbury, Kapuskasing, Sturgeon Falls), and minority status of different proportions in others (e.g. North Bay, Sudbury, Windsor, Ottawa, Cornwall, London, Toronto, Welland). This variation in demographic strength has consequences for ethnolinguistic vitality, with Franco-Ontarians ranging from frequent users or "unrestricted speakers" to "semi-restricted" and "restricted" speakers in minority settings (Mougeon and Beniak 1991). Given this exposure to French that differs from what can be found in other parts of the English-speaking world, it would be inaccurate to state categorically that Anglophones in Ontario acquire French as either a "second" or a "foreign" language.

Publicly funded schools in Ontario can be grouped into three categories from the standpoint of French instruction: French first language schools, English-medium schools with obligatory "Core French" instruction typically beginning in grade four (age 9), and French-immersion schools, with instruction in French starting at various levels of study, with varying levels of intensity, French being used as a medium of instruction for most subjects for learners who do not have French as a first language. For students not attending French first language or immersion schools, the study of the language is optional beyond grade 9 (age 14). At the university level, students who have taken core French to the end of secondary school (grade 12, age 18) will arrive with an A2 level on the scales of the Common European Framework of Reference (CEFR) (Council of Europe, 2002), and aim to attain a B1 by the end of a first year of university studies, while those coming from immersion studies will aim to

solidify the B1 level they have already attained, or advance to the B2 range in first year. At the end of four years of university study of French in a major or specialization program, it is expected that learners will attain a solid B2 level, and that those benefitting from an extended study abroad experience in a French-speaking area will reach a C1 level.

It should also be noted that learners of French as a second language in Ontario are exposed to different varieties of L1 French, the two dominant ones being Reference French (Lyche 2010) and Laurentian French (Côté 2012), depending on the model presented by their teachers, as well as on their exposure to French in the media and in other contexts outside of the classroom. We may find in their French various features of Laurentian French: apical [r] coexisting with uvular [ʀ], assibilation of /t/ and /d/ before high front vowels and glides, and maintenance of the phonemes /ɑ/, /ɛ:/ and /œ/ that have merged with other vowels in Reference French (Tennant 2012).

The corpus studied here was gathered in 2010-11 in an English-language university in southern Ontario, following the IPFC protocol (Racine et al. 2012). In order to represent different levels of proficiency in French and the possible effects of previous school programs and participation in a study-abroad experience, we recruited equal numbers of students in first and in fourth year of study. For the first-year students, we sought a balance in numbers between those coming from French immersion school and those coming from core French, although practical issues related to availability of participants led to a smaller sample in the latter group. For fourth-year students selected for the study, three had spent their third year of university on exchange in France, while the other three had stayed in Ontario. Demographic information about the twelve participants is summarized in Table 1 below.

Group	Speaker Number & Code	Age	Sex
A	1_caloaf	19	M
A	2_caloma	19	F
A	3_calolh	23	F
A	4_calony	19	F
B	5_caloac	19	F
B	6_caloeck	19	F
C	7_calokl	24	M
C	8_calorf	22	F
C	9_caloeh	22	F
D	10_calokb	22	F
D	11_caloab	24	M
D	12_caloat	22	F

Table 1: Speakers in the IPFC - Canadian English corpus. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

Following the IPFC protocol, speakers were asked to complete the following tasks: 1) A guided interview with a native speaker of French; 2) A discussion with another L2 speaker for which each participant was asked to select a topic relating to personal experience on which to speak and then respond to questions asked by the other participant; 3) An exercise in which they listened to recorded words and repeated them (words from the PFC list as well as words prepared for the IPFC study illustrating particular difficulties); 4) Reading aloud the PFC reading passage "Le premier ministre ira-t-il à Beaulieu?". See the first article in this volume for more details on the IPFC protocol and on the criteria for identifying liaison contexts.

For this liaison study, recordings of the interview, discussion and reading passage were transcribed in a *Praat* (Boersma & Weenink 2015) text grid tier and coded by two advanced Anglophone French L2 speakers, according to the IPFC liaison protocol, for the following variables²: 1) target liaison consonant; 2) grammatical category of word1; 3) grammatical category of word2; 4) number of syllables of word1 and nasal vs. oral vowel in final syllable; 5) liaison realization, with or without enchaînement; 6) accuracy of target liaison consonant realization; 7) presence of pause, hesitation or glottal stop. *Dolmen* (Eychenne 2014) was used to extract data on rates of liaison from the coded *Praat* text grids for analysis in *Excel*. Extracted liaison tokens were coded in *Excel* based on Mallet's (2008) classification, which draws on Delattre (1947) and Durand & Lyche (2008), of categorical, variable, and erratic liaisons. The statistical analysis of these data was performed using *Goldvarb* (Sankoff, Tagliamonte & Smith 2012).

4. Results

4.1 Overall Realization of Liaison

The overall realization of liaison in the IPFC Canadian English corpus is 45.3% for the three tasks. Taking out the reading passage task in order to focus on spontaneous speech, we obtain a higher overall liaison realization rate of 47.4%. As can be expected, such figures for general overall realization rate conceal considerable individual variation in a group of L2 learners. Data in Table 1 show that speakers range from 39.4% to 62.1% in liaison rate. Looking at average liaison rate per speaker, we find a mean of 46.3% with a standard deviation of 8.3%. Also, due to varying proportions of grammatical contexts across samples (e.g. more or fewer contexts of categorical liaisons), these data need to be interpreted with caution.

² See also Racine & Detey (this volume) for more details about the coding procedure.

Speaker Code	Liaisons realized	Liaison sites	% realized
1_caloaf	57	103	55.3%
2_caloma	56	136	41.2%
3_caloh	81	205	39.5%
4_calony	85	157	54.1%
5_caloac	28	87	32.2%
6_caloe	46	99	46.5%
7_calokl	74	158	46.8%
8_calorf	41	66	62.1%
9_caloeh	33	78	42.3%
10_calokb	48	96	50.0%
11_caloab	41	104	39.4%
12_caloat	88	209	42.1%
TOTAL	678	1498	45.3%

Table 2: Realization of liaison by individual speakers in IPFC Canadian English corpus in three tasks: interview, discussion, and reading.

4.2 Liaison Realization by Task and Speaker Groups

As can be seen in the overall results reported above including and excluding the reading passage data, liaison rate varies according to task. Table 3 gives the results for overall liaison rate by task and by speaker group. For the first of these variables, the results show that liaison is most frequent in the discussion (48.9%), close to the overall average in the interview (45.1%), and least frequent in the reading passage (39.6%). The factor weights show that liaison is favoured in the discussion (.527), only slightly disfavoured in the interview (.499), and disfavoured in the reading task (.443). These results, determined by the *Goldvarb* analysis to be statistically significant, may appear surprising, given that variable liaisons are expected to become more frequent in more formal styles. It should be borne in mind, however, that these overall results do not distinguish categorical ("obligatory") from variable ("optional") contexts, and also that both of these types of context can show variation in a learner's French (see below). Furthermore, we may be dealing here less with a stylistic continuum than with tasks that challenge L2 learners to apply conventions of diction for reading aloud in French that they may not have mastered (see also Racine this volume for an illustration). Table 3 also shows results for the four groups of speakers according to French learning background: Group A (first year from immersion program); Group B (first year from "core French" program); Group C (fourth year with study abroad); and Group D (fourth year without study abroad). The differences among the groups in percentages of liaisons realized are not statistically significant.

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	279	601	46.4%	n.s.
B	74	186	39.8%	n.s.
C	148	302	49.0%	n.s.
D	177	409	43.3%	n.s.
Task				
Discussion	318	650	48.9%	0.537
Interview	196	435	45.1%	0.499
Reading	163	412	39.6%	0.443
TOTAL	677	1497	45.2%	

Table 3: Realization of liaison in IPFC Canadian English corpus by task and group. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

4.3 Categorical Liaisons

The results of our multivariate analysis of categorical (obligatory) liaisons are presented in Table 4. We observe that the overall realization rate for this type of liaison in both spontaneous speech tasks is approximately 90%. This suggests that overall, these L2 speakers approach the native norm of categorical liaison realization, but without fully attaining it. As we observed for all types of liaison taken together, realization of categorical liaisons varies significantly according to task, the factor weights showing that liaison is favoured in the discussion (.577) and the interview (.548), while it is disfavoured in the reading task (.305). However, unlike what we find with all types of liaison included together in the analysis, when we examine categorical liaisons separately, we find a significant correlation with speaker groups. Categorical liaison realization is favoured most strongly in the fourth-year speakers of Group C who spent a year abroad (.603), followed closely by the first-year students in Group A whose pre-university studies were in an immersion program (.587). Realization of categorical liaison is disfavoured among the fourth-year students of Group D who did not spend a year abroad (.413) and strongly disfavoured by the first-year students of Group B from a core French background (.298). This result supports the hypothesis that immersion experiences and additional years of French language study contribute to progress in attaining a target rate of realization of categorical liaison.

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	217	238	91.2%	0.587
B	62	84	73.8%	0.298
C	113	125	90.4%	0.603
D	152	182	83.5%	0.413
Task				
Discussion	268	297	90.2%	0.577
Interview	160	178	89.9%	0.548
Reading	116	154	75.3%	0.305
TOTAL	544	629	86.5%	

Table 4: Realization of categorical (obligatory) liaison in IPFC Canadian English corpus by task and group. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

In light of the difference in realization of categorical liaison between the spontaneous speech and reading aloud tasks, it would be instructive to look at these types of task separately. Table 5 displays results for the spontaneous speech tasks only (interview and discussion). We find a similar significant result to the one we have just observed for all of the tasks together, with liaison favoured in Groups A and C (in opposite order to what was observed above), and disfavoured in Groups B and D. When we consider the reading task separately (Table 6), we find that the differences in percentage of categorical liaisons realized are not statistically significant. It would appear, therefore that, unlike in spontaneous speech, categorical liaison realization in the reading aloud task is not improved by immersion experiences or additional years of French study for these L2 speakers. This supports the interpretation suggested above that reading aloud is a task of a different nature from spontaneous speech, requiring the implementation of specific conventions that these speakers have not acquired.

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	178	189	94.2%	0.615
B	47	58	81.0%	0.297
C	81	87	93.1%	0.572
D	122	141	86.5%	0.389
TOTAL	428	475	90.1%	

Table 5: Realization of categorical (obligatory) liaison in IPFC Canadian English corpus by group (spontaneous speech only: discussion and interview). Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	39	49	79.6%	n.s.
B	15	26	57.7%	n.s.
C	32	38	84.2%	n.s.
D	30	41	73.2%	n.s.
TOTAL	116	154	75.3%	

Table 6: Realization of categorical (obligatory) liaison in IPFC Canadian English corpus by group (reading task only). Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

It can also be interesting, in order to refine our analysis, to look at how each group realizes categorical liaison in specific high frequency contexts. Table 7 shows liaison realization in the context of a pronoun followed by a form of the auxiliary verbs 'avoir' or 'être' (PRO_L_AUX), the most frequent categorical (obligatory) liaison context in the corpus, for each of the four groups. It is striking to note how close speakers approach 100% in their realization of liaison in this high frequency context. While there are no dramatic divergences among the groups in their liaison rate in this context, we can see that the lowest proficiency group has the highest number of liaisons not realized, seven out of 89, and Groups B and C each have only one liaison not realized. It should be noted that, of the 13 liaisons not realized in this syntactic context, five involve the subject clitic 'ils', which in vernacular Laurentian French tends to be realized as [i], as noted above (Côté 2012), so it would not be accurate to count these cases as liaison errors. Five other cases of non-liaison were in the sequence 'tout est' in the reading passage, while two others involved 'on' before a form of 'avoir' or 'être'. Finally, speaker 3 pronounces "nous avons" without liaison.

Group	Liaisons realized	Liaison sites	% realized
A	82	89	92.1%
B	25	26	96.2%
C	24	25	96.0%
D	74	78	94.9%
TOTAL	205	218	94.0%

Table 7: Realization of liaison in three tasks by speakers in the IPFC Canadian English corpus, in the grammatical context PRO_L_AUX (pronoun followed by auxiliary verb 'avoir' or 'être'). Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

The data in Table 8 for the DET_L_NOM (determiner followed by noun) context, the second most frequent categorical liaison context in the corpus, show an expected high rate of liaison for Group C (94.6%) and a surprisingly

high rate for the lowest-proficiency group, Group A (94.8%). Thirteen of the non-realized liaisons in this context are in the reading passage: 'son usine' (speakers 1, 3, 6, 8, 11), 'les opposants' (speakers 5, 10, 11), 'quelques articles' (Speakers 5, 10), 'les élections' (speaker 10), 'des activistes' (speaker 10). In the spontaneous speech tasks, we find the following pronunciations without liaison: speaker 1 'des exercices'; speaker 5 'mon évènement' and 'mon école'; speaker 6 'les oiseaux'; speaker 8 'leurs accents', speaker 11 'un autobus' and 'tes amis'; and speaker 12 'mes amis'.

Group	Liaisons realized	Liaison sites	% realized
A	54	58	94.8%
B	11	18	61.1%
C	35	37	94.6%
D	31	40	77.5%
TOTAL	131	153	86.3%

Table 8: Realization of liaison in three tasks by speakers in the IPFC Canadian English corpus, in the grammatical context DET_L_NOM (determiner followed by noun). Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

The third most frequent categorical liaison context in the corpus is that of fixed expressions, a heterogeneous group, including 34 occurrences of 'peut-être', 12 of 'tout à fait', nine of 'en effet', five of 'États-Unis', two of 'jeux olympiques', as well as one each of 'je vous en prie', 'tout à coup', and 'sans abri'. The data in Table 9 reflect a wide range of individual variation, with no discernible pattern in liaison realization that can be explained with reference to differing levels of proficiency between the groups. Ten of the 13 non-realized liaisons in fixed expressions occurred in the reading passage: for nine speakers in 'jeux olympiques' (a term that is lexicalized without a liaison consonant in vernacular Laurentian French), and for speaker 11 in 'en effet'. The three non-liaisons in fixed expressions in spontaneous speech are for the least proficient speaker, speaker 5, whose lexical representation of 'États-Unis' appears not to have a liaison consonant.

Group	Liaisons realized	Liaison sites	% realized
A	22	24	91.7%
B	7	12	58.3%
C	27	29	93.1%
D	8	12	66.7%
TOTAL	64	77	83.1%

Table 9: Realization of liaison in three tasks by speakers in the IPFC Canadian English corpus in fixed expressions. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

4.4 Variable Liaisons

Table 10 presents the results of the *Goldvarb* analysis of variable (optional) liaisons. We note that the differences in percentages of realization of this type of liaison among the three tasks and four proficiency groups are not statistically significant. The lack of a significant difference in use of variable liaisons between spontaneous speech and reading-aloud task is consistent with the observation made earlier that these L2 learners have not mastered the stylistic dimension of variable liaison. They not only realize fewer liaisons overall in the reading task than in spontaneous speech, but they also do not, realize, in the reading task, significantly more of those liaisons that are expected to be more frequent in such a formal style. Once again, we can attribute this performance to specific difficulties with the reading-aloud exercise.

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	59	331	17.8%	n.s.
B	10	86	11.6%	n.s.
C	31	160	19.4%	n.s.
D	24	211	11.4%	n.s.
Task				
Discussion	49	331	14.8%	n.s.
Interview	36	252	14.3%	n.s.
Reading	38	204	18.6%	n.s.
TOTAL	123	787	15.6%	

Table 10: Realization of variable (optional) liaison in IPFC Canadian English corpus by task and group. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

When we examine the results for the most frequent grammatical context for variable (optional) liaisons in the corpus, an auxiliary verb ('avoir' or 'être') followed by a past participle (AUX_L_PPA) presented in Table 11, we also observe a lack of correlation with group proficiency levels. In addition, speakers in Group A, where the highest number of tokens are found, vary widely in their liaison realization: speaker 1: 0%, speaker 2: 25%, speaker 3: 76.5%, speaker 4: 90%. Similar fluctuations can be found in other groups, where the numbers of tokens are smaller. Only three of the liaisons pronounced in this context are in the reading passage, in the sequence, 'ont eu'. In the discussion and interview, we find 20 occurrences of 'suis' (with [z]) with past participle of 'aller' (19) and 'arriver' (1), six of 'est' with past participle of 'aller' (4), 'allumer' (1), and 'enlever' (1); three of 'sont' with past participle of 'aller' (10) and 'éteindre' (20); and two of 'sommés' with past participle of 'aller'.

Group	Liaisons realized	Liaison sites	% realized
A	24	38	63.2%
B	1	5	20.0%
C	2	5	40.0%
D	7	14	50.0%
TOTAL	34	62	54.8%

Table 11: Realization of liaison in three tasks by speakers in the IPFC Canadian English corpus, in the grammatical context AUX_L_PPA (auxiliary verb followed by past participle). Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

4.5 Erratic Liaisons

After categorical and variable liaisons, the third category we examine is that of erratic (forbidden) liaisons, which we do not expect to find in the speech of L1 speakers. We see in the data in Table 12 that a consonant was pronounced in only 10 out of 81 possible contexts in the corpus. These include seven pronunciations of a final [n] in 'Berlin' before 'en' in the reading passage, a context that could be argued not to be an instance of liaison at all, but rather a fixed final consonant, one final [n] pronounced in 'Comment, en plus' (speaker 8) and in 'région en' (speaker 8), both in the reading passage as well. There was only one erratic liaison consonant pronounced in the spontaneous speech tasks, by speaker 1 in the aspirated h context 'en haut'. No significant correlation was found between realization of erratic liaison and task or proficiency group.

	Liaisons realized	Liaison sites	% realized	Factor weight
Group				
A	3	32	9.4%	n.s.
B	2	16	12.5%	n.s.
C	4	17	23.5%	n.s.
D	1	16	6.3%	n.s.
Task				
Spontaneous	1	27	3.7%	n.s.
Reading	9	54	16.7%	n.s.
TOTAL	10	81	12.3%	

Table 12: Realization of erratic (forbidden) liaisons in IPFC Canadian English corpus by task and group. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

4.6 Liaison without Enchaînement

Results for the proportion of liaisons realized by the speakers without enchaînement are presented in Table 12. The overall percentage of liaisons

without enchaînement is 7.2%, and it should be noted that 42 out of these 49 liaisons are pronounced with a pause or a glottal stop. Nineteen of them occur in the discussion task, eight in the interview, and 21 in the reading task. Liaison without enchaînement is significantly more frequent in the reading task (.667) than in the interview (.466) and the discussion (.433), illustrating once again the difficulty of the reading aloud exercise. The data also show a significant correlation with liaison type, with non-enchaînement being strongly favoured with erratic liaisons (.924), favoured with variable liaisons (.557), and disfavoured with categorical liaisons (.476). It should be recalled that, in L1 French, liaison without enchaînement is an infrequently occurring characteristic of certain public speaking styles (Encrevé 1988), and it is found to be almost non-existent in the PFC corpus (Durand & Lyche 2008). In addition, in native speech, its occurrence is limited to contexts of variable (optional) liaison. While, in the absence of other evidence, the higher rate of non-enchaînement in variable liaisons compared to categorical liaisons might be interpreted as reflecting L2 speakers' knowledge of these L1 constraints on the phenomenon, an explanation in terms of learner errors would be more plausible. As noted in the literature review, lack of enchaînement of a liaison consonant by an L2 speaker of French can be interpreted as an error relating to the open syllable structure of French generally, which contrasts with the closed syllable pattern of Anglophone learners' L1 (Tennant, in press). This interpretation is supported by the significant differences observable in Table 13 between our groups of speakers in the proportion of liaisons that are realized without enchaînement. Non-enchaînement is favoured in the lower-proficiency groups (A and B) and disfavoured in the higher proficiency groups (C and D). In addition, within Group A, two of the four speakers produce most of these consonants without enchaînement, speaker 1 having 12 and speaker 3 having 11. In Group D, six out of the eight liaisons without enchaînement observed are from speaker 11. The one speaker in the corpus who uses enchaînement with all of his liaison consonants, speaker 7, spent his third year in France and speaks with a very high level of proficiency.

	Liaisons realized	Liaison sites	% realized	Factor weight
Liaison Type				
Categorical	33	544	6.1%	0.476
Variable	11	123	8.9%	0.557
Erratic	5	10	50.0%	0.924
Group				
A	30	279	10.8%	0.673
B	7	74	9.5%	0.579
C	4	148	2.7%	0.227
D	8	176	4.5%	0.439

	Liaisons realized	Liaison sites	% realized	Factor weight
Task				
Discussion	19	318	6.0%	0.433
Interview	9	196	4.6%	0.466
Reading	21	163	12.9%	0.667
TOTAL	49	677	7.2%	

Table 13: Proportion of liaisons without enchaînement in three tasks by speakers in the IPFC Canadian English corpus. Group A: 1st year immersion or French school * (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

4.7 Liaison Errors with Non-Target Consonants

Table 14 displays the results from our corpus for substitutions of non-target liaison consonants. Four out of 22 of these are pronounced with a pause or glottal stop. Frequency of errors is significantly correlated with liaison type, with errors being strongly favoured in variable liaisons (.958) and in erratic liaisons (.795), and disfavoured in categorical liaisons (.322). In addition, frequency of errors varies significantly according to task, with the reading-aloud task strongly favouring consonant substitution errors (.915), while errors are considerably disfavoured in the discussion (.354) and interview (.274). Once again, we can invoke the particular difficulty of the reading task in the interpretation of these results.

	Liaisons realized	Liaison sites	% realized	Factor weight
Liaison Type				
Categorical	2	541	0.4%	0.322
Variable	19	124	15.3%	0.958
Erratic	1	10	10.0%	0.795
Group				
A	6	278	2.2%	n.s.
B	4	74	5.4%	n.s.
C	8	149	5.4%	n.s.
D	4	174	2.3%	n.s.
Task				
Discussion	2	316	0.6%	0.354
Interview	1	197	0.5%	0.274
Reading	19	161	11.8%	0.915
TOTAL	22	674	3.3%	

Table 14: Proportion of non-target liaison consonants in three tasks by speakers in the IPFC Canadian English corpus. Group A: 1st year immersion or French school (~B1); Group B: 1st year Core French (~A2); Group C: 4th year with study abroad in France (~C1); Group D: 4th year without study abroad in France (~B2).

Furthermore, the lack of significant correlation with group indicates there is no evidence to confirm the hypothesis that a higher level of proficiency would lead to fewer such errors. Indeed, the highest-proficiency group, the fourth-year students in Group C who had studied in France, along with the first-year students from immersion backgrounds in Group B, show the highest rate of errors (5.4% of liaisons). If we break down these errors by task, we find that only three occur in the interview and discussion tasks: 'c'est [d] un' (speaker 3); 'nous [s] avons' (speaker 5); 'sont [n] éteints' (speaker 12). None of the speakers in Group C make such errors in these spontaneous speech tasks. The rest of the errors occur in the reading task: 'grand [d] émoi' (speakers 1, 5, 6, 7), 'grand [n] émoi' (speakers 10 11), 'jeux [d] olympiques' (speaker 1), 'circuits [t] habituels' (speakers 7, 8), 'comment [n] en plus' (speaker 8), 'vraiment [n] une étape' (speaker 8), and 'grand [d] honneur' (speakers 1, 3, 4, 6, 8, 10). Speaker 8, in Group C, makes the highest number of errors, while speaker 2 (in Group A) and speaker 7 (in Group C) make no errors at all. In short, these speakers, in spontaneous speech, have little difficulty using the right liaison consonant. Difficulties arise for all of these L2 speakers, whatever their proficiency level, in getting all aspects of liaison right in a challenging reading-aloud task.

4.8 Specific Laurentian Liaisons Not Observed

It should be noted that, other than the cases of the pronoun 'ils' noted above, our speakers did not diverge from Reference French norms in liaison by using vernacular Laurentian French forms noted in Côté (2012), e.g. /t/ as liaison consonant in 'je suis' and 'tu es'.

5. Discussion

The aim of this study was to take a closer look at liaison in Canadian Anglophones' L2 French than in previous studies, and, in so doing, to contribute data that lend themselves well to comparison with those of IPFC studies, currently available and in preparation, on corpora of French L2 learners with other first languages.

Considering all types of liaison together, speakers in our corpus realized 45.3% of liaisons (47.4% for spontaneous speech tasks alone). This approximates the 44.1% rate for 35 survey points in the PFC database (Durand et al. 2011: 113). In our corpus, categorical liaison was realized at a rate of 86.5%, while 15.7% of variable liaisons were realized and 12.3% of erratic liaison contexts showed pronunciation of the consonant. Categorical liaisons are more frequent in spontaneous speech tasks than in the reading-aloud task, and in spontaneous speech tasks, speakers who have benefitted from an immersion learning opportunity (an immersion program in school or a study abroad program) come closer to attaining the native target of categorical realization of these liaisons than those who have not. Realization of variable

liaisons, on the other hand, is related neither to task nor to proficiency group, suggesting that these speakers, whether at an intermediate or an advanced level, with or without study abroad experience, do not fully acquire the stylistic dimension of this type of liaison. Finally, we find a very low level of pronunciation of consonants in contexts identified as potential sites for erratic (forbidden) liaisons. Almost all of these involved the consonant [n] in the reading task; occurrences of erratic liaisons in spontaneous speech were negligible.

In our corpus, 7.2% of liaisons were realized without enchaînement, with non-enchaînement occurring primarily with erratic and variable liaisons, and less frequently with categorical liaisons. The overall proportion of non-enchaînement is consistent with results of other studies of Canadian Anglophones: Mastromonaco (1999: 213), who noted a 93% rate of enchaînement of liaison consonants, and Thomas (2004: 368), who observed that 8.5% of liaisons in his corpus were pronounced without enchaînement. Our data further showed that non-enchaînement was more frequent in reading aloud than in spontaneous speech, and among intermediate learners in comparison to advanced learners. This result, combined with the fact that non-enchaînement is favoured in reading aloud and disfavoured in spontaneous speech, suggests that we are dealing, to a large extent, with an effect of the written form. It also suggests that these speakers may, as they advance in their learning, acquire this dimension of liaison that is linked to the predominantly open syllable structure of French, a structure that differs from that of their L1. Data from Anglophone learners at lower levels of overall French proficiency would be needed to confirm this interpretation.

Errors involving substitution of non-target consonants occur in only 3.3% of liaisons in the corpus, mostly in variable and erratic liaison types, and rarely with categorical liaisons. Moreover, they occur primarily in the reading-aloud task, appearing in less than 1% of liaisons in spontaneous speech. In our corpus, there is no significant difference among proficiency groups as regards the frequency of consonant substitution errors, which can be said to be random occurrences, primarily an artefact of oral performance of a written text.

A number of our results (realization of categorical liaison, liaison without enchaînement, consonant substitution errors) show a fundamental difference between how Anglophone L2 speakers realized French liaisons in the reading-aloud exercise as opposed to spontaneous speech. Our learners, without difference as to overall proficiency level, did not show style shifting to a higher rate of variable liaison realization when performing the reading task. They clearly have not mastered the conventions of this genre, although they probably could with explicit training in it, as De Moras' (2011) study suggests. The results for the spontaneous speech tasks should, for this reason, be considered to be more representative of these L2 speakers' competence with

liaison than those for the reading task. And those results suggest that these intermediate and advanced learners have mastered the core of liaison, approaching the L1 target in their rate of realization of categorical (obligatory) liaisons, while making a negligible number of substitution errors, and applying the expected enchaînement about 95% of the time. The results also suggest that rate of categorical liaison increases with immersion experiences and that non-enchânement diminishes at higher levels of French language study.

What are the implications of these findings for theoretical discussions on the nature of L2 liaison acquisition? As noted in the literature review, Barreca & Floquet (2015) propose a typology of liaison realizations that could serve as a means of evaluating, in light of corpus data, Wauquier's (2009) hypothesis that L2 acquisition of liaison is based on a case-by-case treatment of liaison using surface orthographic representation, as opposed to Harnois-Delpiano et al.'s (2012) hypothesis that L2 learners develop phonological generalizations. Our results show examples of some elements of Barreca & Floquet's typology: a) performance errors such as 'grand [d] honneur' reflecting spelling influence, and liaison without enchaînement, possibly under the influence of L1 syllable structure; b) phonological generalizations in the form of (infrequent) erratic liaisons ('en haut'); c) liaison consonant substitution errors ('jeux [d] olympiques'). It should be emphasized, however, that these forms are infrequent in our corpus, and that we don't find certain kinds of generalization errors that Barreca & Floquet observe among Italian L1 speakers, such as insertion of an unexpected liaison consonant before a consonant-initial word ('les [z] garçons') or a vowel-initial word ('quatre [z] enfants'). In short, we find scant data in our results to support the view that Anglophone speakers at this level make errors that reflect phonological generalizations, in addition to, or instead of, using lexical strategies in their acquisition of liaison. We would likely need to examine data from learners at earlier levels of acquisition to find more robust evidence of such generalizations.

6. Conclusion

Our results suggest that these Canadian Anglophone learners at intermediate and advanced levels have succeeded in acquiring the main elements of French liaison, although they have not fully attained a native level of realization of categorical liaisons, nor have they mastered style shifting with variable liaisons. They appear to progress in acquiring enchaînement with more years of French study, while erratic liaisons and liaison consonant substitution errors occur infrequently and sporadically in their French, especially in spontaneous speech. It should be borne in mind that these results come from a population of Anglophones acquiring French in a milieu where exposure to the language is readily available. Future studies applying the IPFC protocol to learners of French in other English-speaking countries will give a fuller picture of how

Anglophones acquire liaison. This research, combined with work on other L1 populations in the *Projet IPFC* in this volume and elsewhere, will contribute to a rich source of data that will allow us to expand considerably our understanding of how liaison is acquired in French as a second or foreign language.

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