LANGUAGE ATTITUDES VS. SOCIO-DEMOGRPHIC INFORMATION

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Continuing on the previous analysis, the association between participants' socio-demographic background and their language attitudes will be investigated. The focus will be placed on three key variables: country of birth, preferred type of French to learn, and the origin of French teachers. Generally, we are interested in this question: do

- participants of different continent/country of birth
- participants preferred to learn different type of French
- participants taught by French teacher of different origins

evaluate speakers of various accents and races differently?

1. Analysis of Three Demographic/Linguistic Variables

To examine the potential effect of country/continent of birth, origin of French teachers, and preference for French accent on languages attitudes, visualizations and statistical tests will be employed. Kruskal Wallis test is a non-parametric alternative to the one-way ANOVA. Compared to parametric tests, non-parametric tests do not assume that the data comes from a particular distribution. The null hypothesis is that the location parameters of the distribution of the variable of interest are the same in each group, while the alternative hypothesis is that they differ in at least one group. From the output of the Kruskal-Wallis test, it is known that there is a significant difference among groups, but it is unclear about which pairs of groups are different. To identify which groups are different, a significant Kruskal-Wallis test is usually followed up by a Dunn's test, which is a post-hoc non-parametric test. We will start from the examination on the accent of speakers in section 1.1 and then race of speakers in section 1.2.

1.1. Accent.

This subsection will investigate if participants from different groups of country/continent of birth, taught by French teachers of various origins, and having different preferences for French accent will hold dissimilar attitudes to a certain accent.

1.1.1. *Country/Continent of Birth vs. Accent.*

Recall that if the data is grouped by the country of birth, 52 participants were born in Canada, and 42 were not. For people who were not born in Canada, a great proportion of them are from Asia (32), which is followed by America (6) and Europe (4). Continent America is defined to be a landmass comprising the totality of North and South America except Canada in this analysis. As a result, there will be four levels in the variable of *Country/Continent of Birth*: America (6), Asia (32), Europe (4), and Canada (52). Figure A.5 visualizes how participants from different continent/country of birth evaluate a certain French accent. It can be observed from this figure that overall participants from Europe and America tend to present more positive attitudes to each accent compared to those who are from Asia and Canada. In addition, Figure A.6 compares the mean scores of participants born in different continent/country across five accents. Specifically, participants from Europe give apparently more positive feedback to the Acadian accent and English accent, along with slightly more positive feedback to the African accent compared to participants from America. By contrary, higher scores are given by the group of American participants to European accent and Quebec accent than the group of European participants. To verify the empirical findings, Kruskal-Wallis tests are conducted to check if the difference of different groups in each accent is significant, with the results summarized in Table 1.

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Based on the guidelines for Kruskal-Wallis test [1], the group of participants from Europe will not be involved in the test due to insufficient sample size because it will to inaccurate p-values. It is demonstrated in Table 1 that there is no significant difference among groups of continent/country of birth in the evaluation for each accent.

Accent	Test Statistics	P-value
Acadian	4.50	0.105
African	0.23	0.892
English	3.14	0.208
European	5.06	0.080
Quebec	1.84	0.399

TABLE 1. Results of Kruskal-Wallis Tests on Continent/Country of Birth for Each Accent

1.1.2. ***Origins of French Teacher vs. Accent.*** If grouping the participants by the origins of their French teachers, there are 46 participants taught by teachers from France, 24 participants taught by teachers from Quebec, 4 participants taught by teachers from both France and Quebec, and 18 participants taught by teachers from other countries/districts. As shown in Figure A.7, the evaluation behaviors of four groups from each accent are unlike the groups by the continent/country of birth. Figure A.8 compares the mean scores of participants taught by French teachers of different origins in each accent. It appears that participants taught by teachers from both France and Quebec gave the highest scores to the Acadian accent, African accent, English accent, and Quebec, while giving the lowest scores to European accent. For the remaining three groups, the mean evaluations to the European accent and English accent are almost identical; participants taught by teachers from Quebec present more positive attitudes to the Acadian accent and Quebec accent and less positive attitudes to the African accent than the another two groups. Table 2 summarizes the results of Kruskal Wallis test on the groups of participants taught by various French teachers in each accent. The group of participants taught by teachers from both France and Quebec will be removed prior to the test due to the sample size consideration. As evidenced by Table 2, there only exist significant difference among three groups in the evaluation on recordings spoken in Acadian accent.

Accent	Test Statistics	P-value
Acadian	6.20	0.045
African	0.21	0.900
English	0.45	0.797
European	2.25	0.325
Quebec	4.76	0.093

TABLE 2. Results of Kruskal-Wallis Tests on Origins of French Teacher for Each Accent

Followed up by a Dunn's test to identify which pair of groups are significantly different, it is shown in Table 3 that participants taught by teachers from Quebec held significantly more positive attitudes toward than Acadian accent compared to those who are taught by from elsewhere. Except for this pair, all the pair-wise comparisons among three groups across five accents are non-significant. As a reminder, participants taught by teachers from both France and Quebec are excluded.

Group 1	Group 2	Test Statistics	P-value	Adjusted P-value
Elsewhere	France	1.64	0.101	0.304
Elsewhere	Quebec	2.49	0.013	0.039
France	Quebec	1.27	0.205	0.615

TABLE 3. Results of Dunn's Test on Origins of French Teacher for Acadian Accent

1.1.3. ***Preference for French Accent vs. Accent.*** If grouping the data by the type of French accent that participants prefer to learn, 55 participants prefer to learn French from France, 7 participants prefer to learn French from France, and 32 participants have no preference. It can be observed from Figure A.9 and Figure A.10 collaboratively that three groups of participants evaluate Acadian accent and African accent similarly. For the other three accents (English, European, and Quebec), participants who preferred to learn French from France hold more positive attitudes to all these three accents compared to the other two preference groups. Surprisingly, the European accent is most favored by participants who preferred to learn French from France, but the Quebec accent is least favored by participants who preferred to learn French from Quebec. Despite the existence of differences, the results of Kruskal-Wallis tests presented in Table 4 indicate that differences are all insignificant.

Accent	Test Statistics	P-value
Acadian	0.88	0.644
African	0.081	0.960
English	1.82	0.403
European	3.40	0.183
Quebec	0.93	0.628

TABLE 4. Results of Kruskal-Wallis Tests on Preference of French Accent for Each Accent

1.2. **Race.** The subsection will examine if participants from different country/continent of birth, taught by French teachers of different origins, and having various preferences for French accents will hold dissimilar attitudes to dichotomous races.

1.2.1. ***Comparison of Languages Attitude Toward A Certain Race.*** It is demonstrated in Figure A.11 that participants from Asia and Canada tend to give less positive feedback to speakers of either race compared to participants from America and Europe. If grouping the participants by the origins of their French teachers, Figure A.12 reveals that participants who have French teachers from Both Quebec and France held more positive attitudes to black speakers compared to the other three groups, while recordings from white speakers are less favored by participants who have French teachers from Both Quebec and France compared to the other three groups. If grouping the participants by the preferred type of French to learn, the evaluation behavior is pretty similar among three groups to either race. Following the same methodology in analysis of the accent, Kruskal Wallis tests are implemented on three grouping variables receptively over two races. As evidenced by Table 5, regardless of the race of speakers, there is no significant difference of language attitudes among participants grouped by any one of the grouping variables.

Race	Grouping Variable	Test Stiatiscs	P-value
Black	Continent/Country of Birth	3.36	0.187
	Origins of French Teacher	1.03	0.597
	Preferred Type of French to Learn	1.35	0.510
White	Continent/Country of Birth	0.77	0.681
	Origins of French Teacher	2.7	0.260
	Preferred Type of French to Learn	0.03	0.986

TABLE 5. Results of Kruskal Wallis Test on Different Grouping variables Across Race

1.2.2. ***Comparison of Languages Attitudes Across the Race of Speaker.*** It is found in the previous analysis that participants gave significantly more positive evaluations to black speakers than to white speakers. More in-depth examination on race will be conducted after recruiting the effect of three grouping variables one by one. After dividing the participants by each grouping variables, we calculate the the mean scores of evaluation on black speakers and white speakers respectively for each level of the grouping variables. It is shown in Table 6 that on average black speakers received more positive feedback than white speakers in all groups. To assess the significance of the difference, a Wilcoxon Signed Rank test will be adopted, which is a non-parametric alternative to the paired samples t-test for comparing paired data. Two data samples are paired if they come from repeated observations of the same subject. Observing the p-values listed in Table 6, participants who were born in Canada held significantly more positive attitudes toward black speakers compared to other participants, and participants who preferred learn French from France gave significantly higher scores to black speakers than to white speakers.

	μ_{Black}	μ_{White}	Test Statistics	P-value
Continent/Country of Birth				
America	45.83	43.53	253	0.681
Asia	40.66	39.54	5748	0.872
Canada	42.29	40.42	17900	0.011
Europe	47.85	46.05	108	0.628
Origin of French Teacher				
Elsewhere	41.53	39.77	2704	0.323
France	42.38	40.74	12984	0.168
France and Quebec	46.00	41.80	12	0.279
Quebec	42.34	41.14	3664	0.456
Preferred Type of French To Learn				
French from France	42.95	40.89	19682	0.045
French from Quebec	41.26	39.89	296	0.351
No preference	41.11	40.14	6054	0.557

TABLE 6. Results of Wilcoxon Signed Rank Tests on Race

1.3. **Examine the Effect of Accent, Race, and One Demographic/Linguistic Variable simultaneously.** After exploring the effect of each demographic/linguistic variable individually, it is of interest that whether there is any interaction effect between the demographic/linguistic background and their languages attitudes to speakers of different races and accents. Namely, do the evaluations on speakers of different races and accents will be depend on any of these demographic/linguistic variable?

To determine whether there is a significant interaction between accent, race, and any one of the demographic/linguistic variables on the language attitudes, mixed ANOVAs will be performed. The primary purpose of a mixed ANOVA is to explore if there is an interaction between the within-subjects factor and between-subjects factor on the dependent variable. In this study, accent and race will be two within-subject variables, and the demographic/linguistic variable will be a between-subject variable. Due to extremely insufficient sample sizes, the group of participants who were born in Europe and the group of participants who were taught by French teachers from both Quebec and France will not involve in the model.

Table B.7, B.8, and B.9 summarize the results of mixed ANOVAs using three different between-subject variables respectively. The results reveal that there are neither significant three-way interactions among accent, race and any one of the three demographic/linguistic variables nor two-way interaction between accent and any one of the three demographic/linguistic variables and two-way interaction between race and any one of the three demographic/linguistic variables. An interaction effect means that the effect of one factor depends on the other factor. The lack of significant interaction effect in this study reveals that the effect of accent or race of speakers on language attitudes will not depend on the participants' country/continent of birth, preferred type of French to learn and origins of their French teachers, which echo the results from section 1.1 and 1.2.

2. **Supplementary Analysis**

As discussed in the previous meeting, the origins of French teachers may affect participants' criteria of the potential to be a good French teacher at UBC. To have a straightforward impression, Figure 1 visualize the frequency of different responses to the question "I think this is beautiful French" for each accent grouping by participants' preferred type of French to learn. Comparing the groups of participants who preferred to learn French from France and French from France respectively, it can be observed from the first two plots of Figure 1 that only participants who preferred to learn French from France gave negative evaluation to Quebec accent. For the group of participants who had no specific preference, more critiques are given to the European accent compared to the Quebec accent.

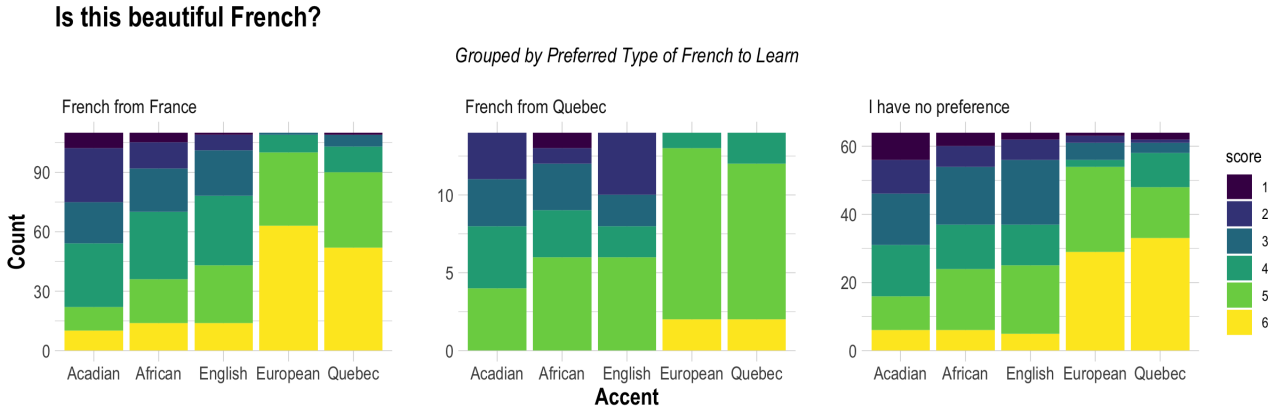

FIGURE 1. Response to Beautiful French Grouped by Preferred Type of French to Learn

It is shown in Figure 2 that participants taught by teachers from France present more positive attitudes to the European accent than those who were taught by teachers from Quebec. Conversely, participants taught by teachers from Quebec held more positive attitudes to Quebec accents compared to those who were taught by teachers from France. For participants taught by teachers

from both Quebec and France, their evaluations to both Quebec accent and Quebec accent are all positive. For participants taught by teachers from elsewhere, it appears that the European accent is more favored by them and regarded as "beautiful French."

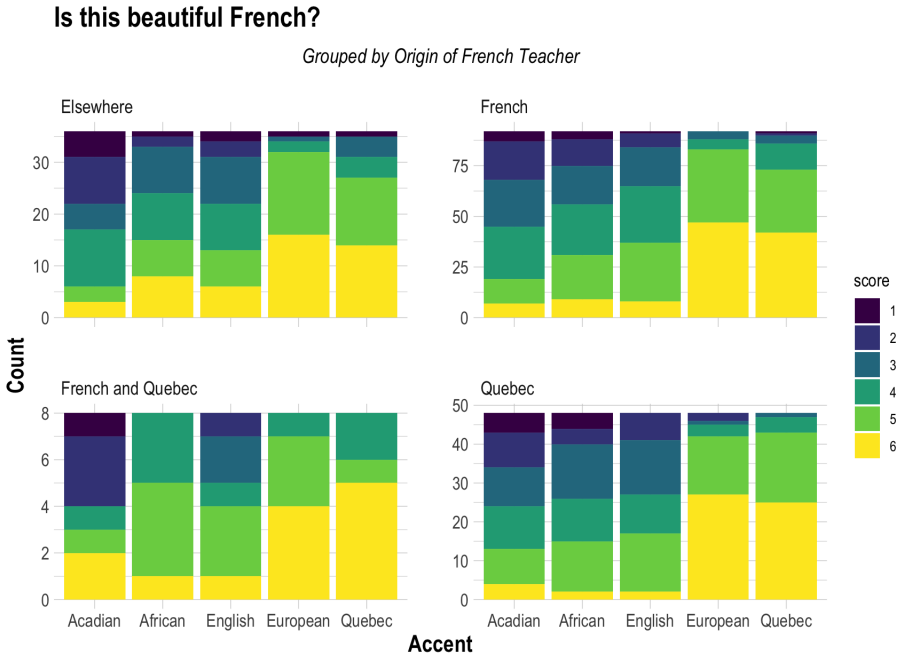

FIGURE 2. Response to Beautiful French Grouped by Origin of French Teacher

There is another question asking whether the speaker will be a good French teacher at UBC. For the group of participants who preferred to learn French from France, it is shown in the first plot of Figure 3 that slightly less positive feedback was given to European accent than Quebec accent, For the group of participants who preferred to learn French from Quebec, all of them held positive attitudes toward European accent, while a small portion of slightly negative evaluation was given to Quebec accent. For participants who had no specific preference, it appears that they would prefer speakers with Quebec accent to be French teachers at UBC.

If grouping the participants by origins of French teachers for the same question, Figure 4 reveals that both participants taught by teachers from France and participants taught by teachers from Quebec held more positive attitude to speakers with Quebec accent compared to speakers with Quebec accent, while the difference is more obvious in the group of participants taught by teachers from Quebec. For the groups of participants whose teachers are from both France and Quebec, their evaluation of Quebec and French accent are identical, which echo their language background. For the groups of participants taught by French teachers from elsewhere, they are more likely to agree that speakers with Quebec accents will be good teachers at UBC.

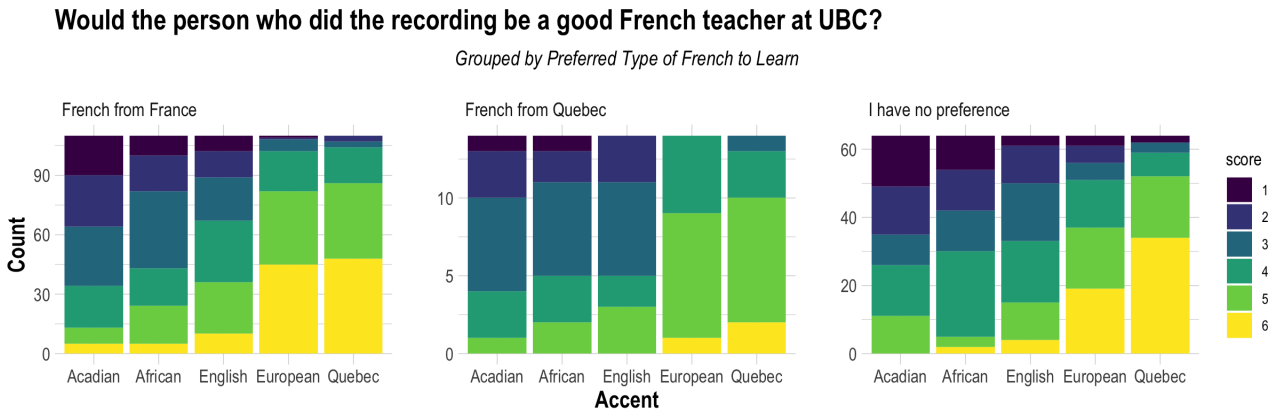

FIGURE 3. Response to the Potential to be French Teacher Grouped by Preferred Type of French to Learn

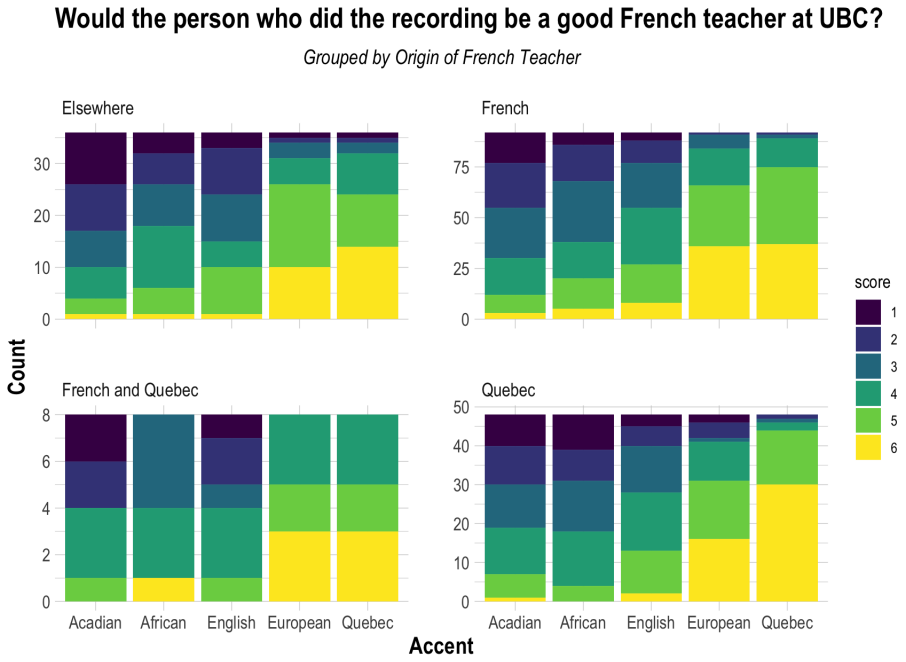

FIGURE 4. Response to the Potential to be French Teacher Grouped by Origin of French Teacher

References

[1] Minitab. *Data considerations for Kruskal-Wallis Test.* Minitab Express Support. https://support.minitab.com/en-us/minitab-express/1/help-and-how-to/modeling-statistics/anova/how-to/kruskal-wallis-test/before-you-start/data-considerations/

Appendix A. Figures

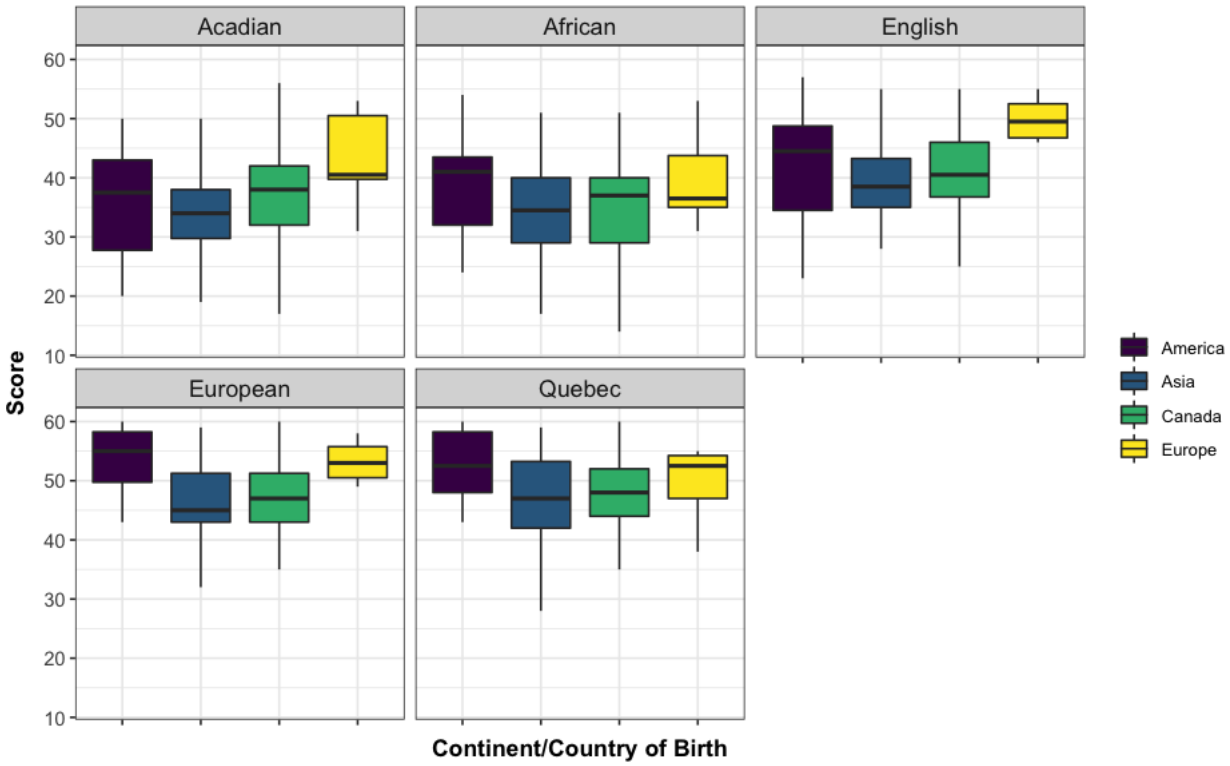

Figure A.5. Accent vs. Continent/Country of Birth

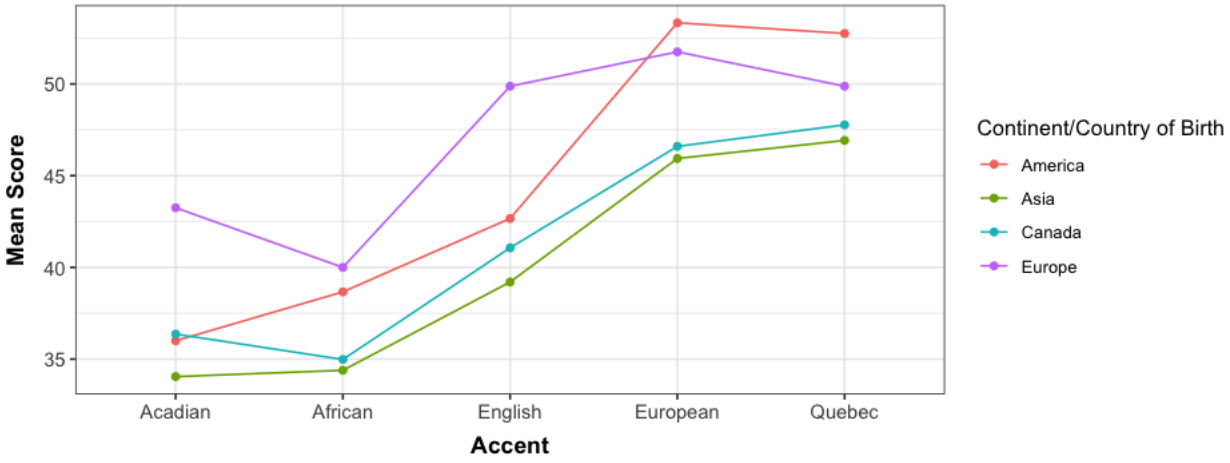

Figure A.6. Mean score of participants from each continent/country across accent

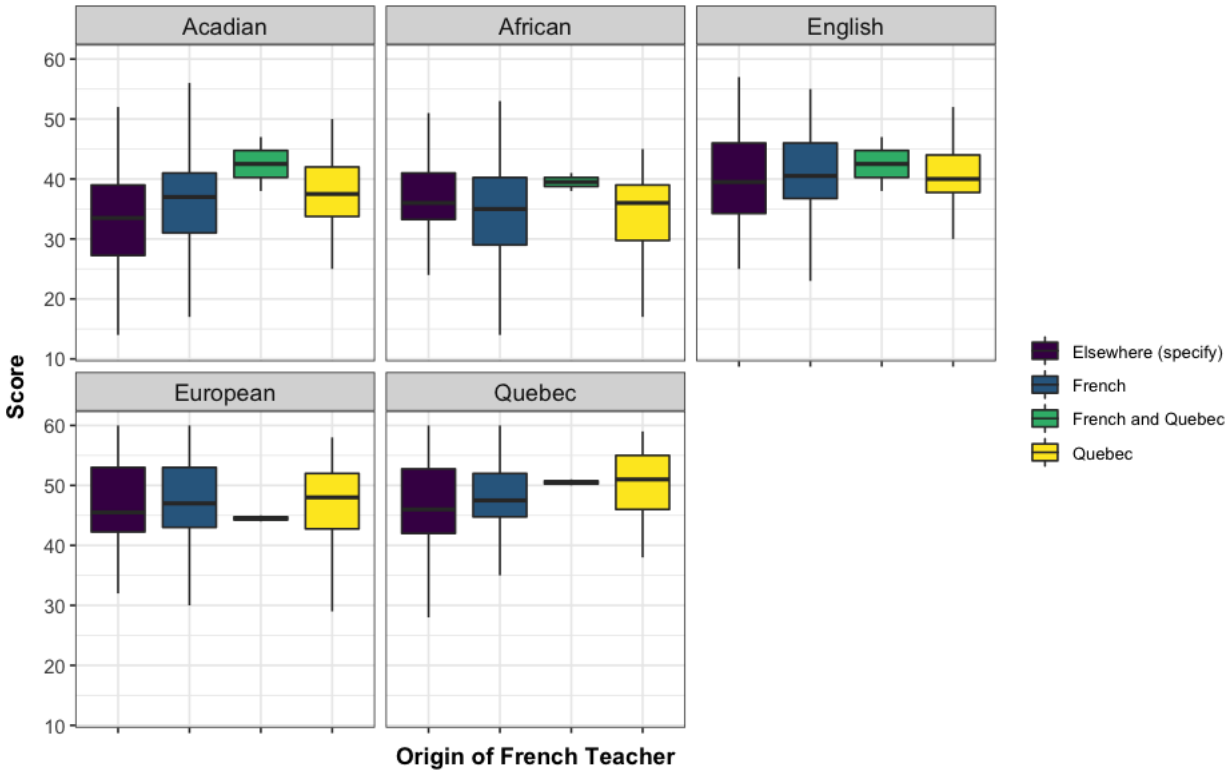

FIGURE A.7. Accent vs. Origin of French Teacher

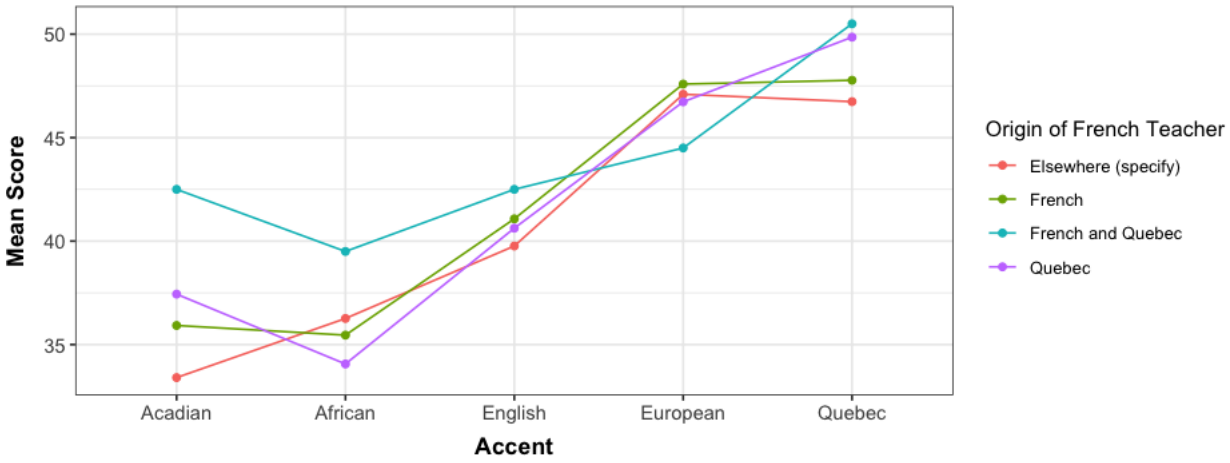

FIGURE A.8. Mean score of participants with French teacher of different origins across accent

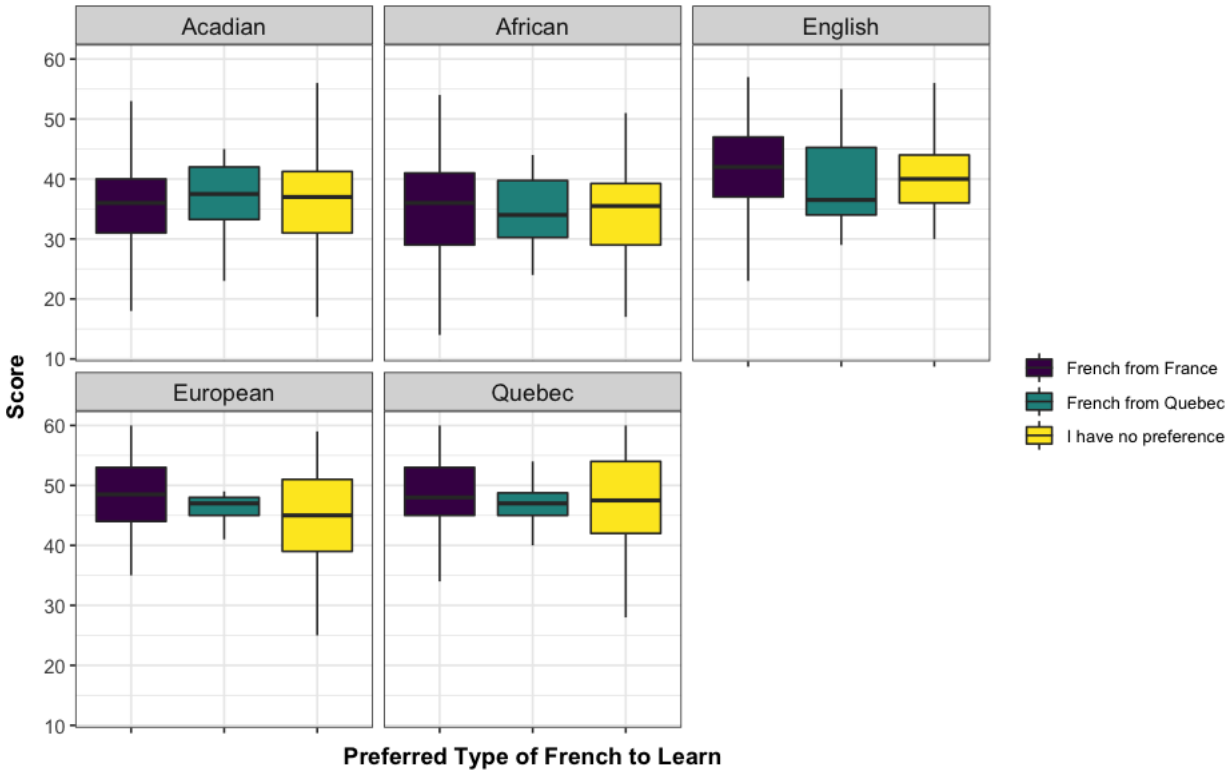

FIGURE A.9. Accent vs. Preference for French Accent

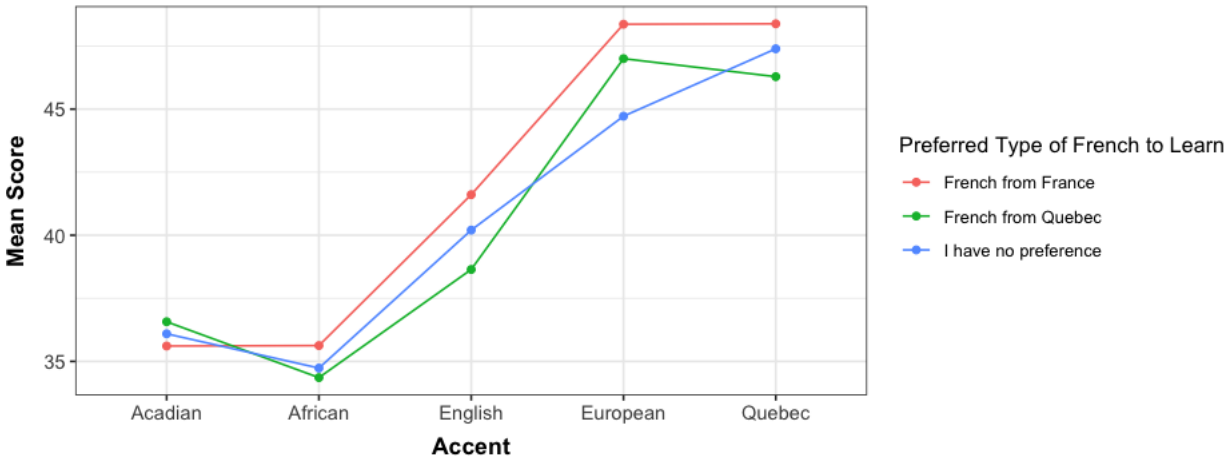

FIGURE A.10. Mean score of participants with different Preferred French accent to learn across accent

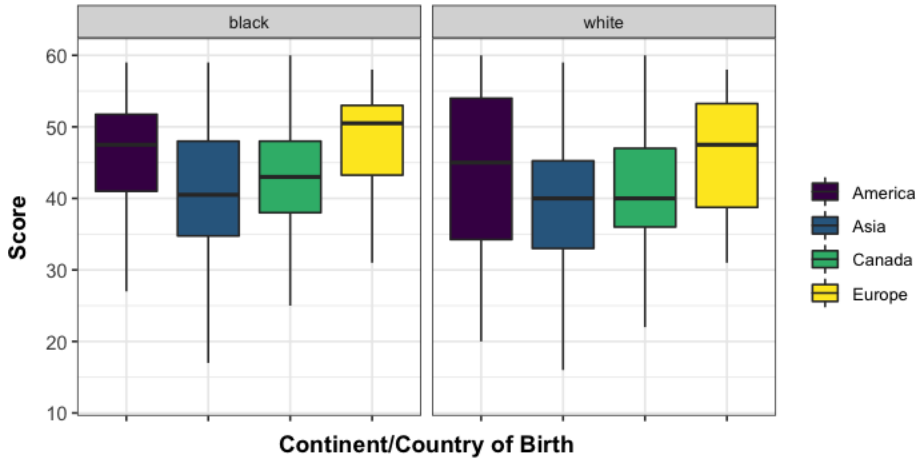

FIGURE A.11. Race vs. Continent/Country of Birth

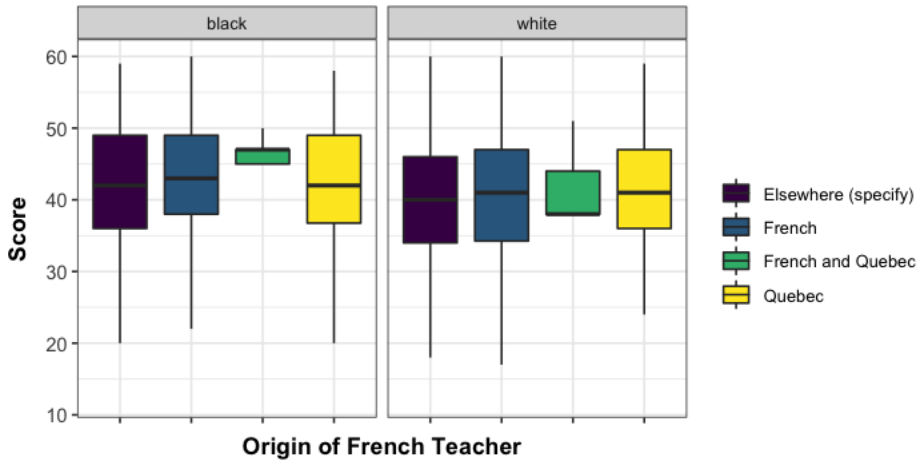

FIGURE A.12. Race vs. Origin of French Teacher

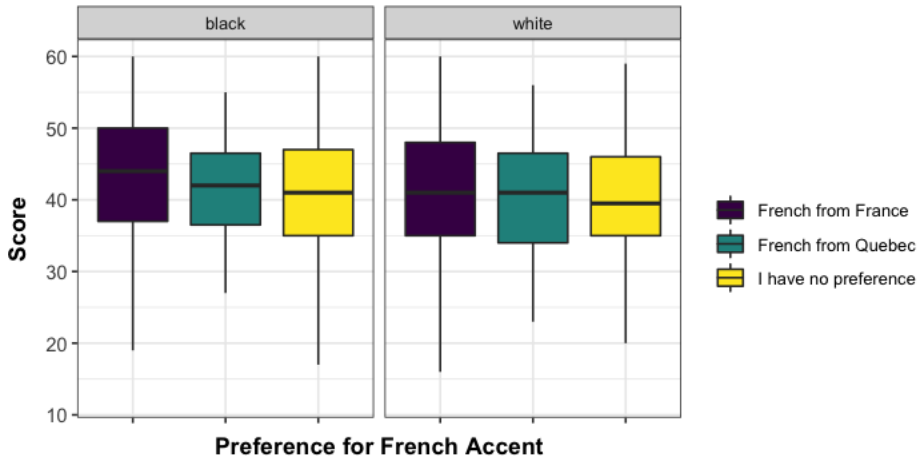

FIGURE A.13. Race vs. Preference for French Accent

Appendix B. Tables

Effect	**F**	**P-Value**
Continent	2.254	1.11e-01
Accent	78.600	4.13e-33
Race	18.369	4.78e-05
Continent: Accent	1.191	3.13e-01
Continent:Race	1.251	2.92e-01
Accent:Race	6.695	3.39e-05
Continent:Accent:Race	1.279	2.53e-01

Table B.7. Mixed ANOVA on Accent, Race, and Continent/Country of Birth

Effect	**F**	**P-Value**
Type of French	0.605	5.48e-01
Accent	67.837	2.96e-30
Race	14.873	2.17e-04
Type of French: Accent	1.123	3.49e-01
Type_of_french:Race	2.152	1.22e-01
Accent:Race	4.016	3.00e-03
Type_of_french:Accent:Race	1.085	3.73e-01

Table B.8. Mixed ANOVA on Accent, Race, and Preferred Type of French to Learn

Effect	**F**	**P-Value**
Teacher_origin	0.318	7.28e-01
Accent	129.218	5.86e-47
Race	29.207	5.50e-07
teacher_origin: Accent	1.689	1.32e-01
teacher_origin:Race	0.325	7.23e-01
Accent:Race	8.517	1.44e-06
teacher_origin:Accent:Race	0.674	7.14e-01

Table B.9. Mixed ANOVA on Accent, Race, and Origin of French Teacher

Department of Statistics, University of British Columbia