XXXXXXX XXXXX - Honors Thesis Proposal

Submission Date: Fall 2018

Anticipated Graduation Date: April 2019

Working title: Using Electropalatography to Analyze Intra-Speaker Variability in German L2 Fricative Production

Project Purpose

The purpose of this project is to assess the variance that occurs in linguapalatal contact patterns during the production of [ç], [x], and /ʃ/ in native English speakers learning German as a second language. It is hypothesized that L2 learners will experience significantly more variance in the production of non-native speech sounds than native language speakers.

Project Importance

Electropalatography (EPG) is a useful feedback tool that allows speech scientists to gather data about tongue contact with the roof of the mouth or palate during speech. The technology has recently undergone advancements that make it more functional and accessible as a research and instructional tool. Variation in speech in a normal vs a stressed system has been examined in terms of various communication disorders, but not in terms of second language learning. Examining variance in speech production using EPG data will allow researchers to gain insight into the processes of normal speech production in various settings. These data may help us to better understand both normal speech production and the speech production during second language learning.

Project Overview

Dr. Shawn Nissen of the BYU Communication Disorders Department has been using EPG as a research tool in his lab since early 2008. Laboratory assistants and graduate students have aided in studies examining native English speech production using EPG as a measurement tool. In 2014, Dr. Nissen began to work as part of a collaborative research effort exploring the use of EPG in second language learning. As a research assistant in Dr. Nissen's lab over the last year, I have had exposure to the research skills necessary to pursue this line of research, including data collection, analysis, and interpretation.

Good!

Research in Dr. Nissen's lab often involves the collection of speech data from multiple speaker production across different linguistic contexts. Previous findings have generally reported findings in terms of mean values that have been collapsed and averaged to create a single representation of the average production of a sound for each speaker. While this is an effective measurement for native speakers, I have noticed in my work as a research assistant that non-native speakers often produce non-native sounds with considerable variability. After discussion with Dr. Nissen, the two of us agreed that there is a need for an examination of the intra-speaker variability in speech productions for L2 speakers compared to native speakers. I predict that in the production of unfamiliar non-native sounds, L2 speakers will exhibit greater

variability than in the speech productions of the non-native language. By analyzing the variance of non-native sound production, I hope to provide greater understanding into the process of learning a second language that can be used to assist with second language acquisition and accent reduction.

In order to complete my thesis, I will be examining data previously gathered by graduate students who have worked in Dr. Nissen's lab in the last three years. The first set of data was gathered by Isaacson in 2015, which includes fricative productions by native German speakers, i.e. [ç], [x], and /ʃ/. Both [ç] and [x] are non-English sounds, but the /ʃ/ fricative is found in the English language as the "sh" sound. The second data set was gathered by Lester (2017) and Cope (2018), and includes the German sounds [x] and [ç] produced by native English speakers learning German as an L2.

For each study, I will examine the production of each target sound for each speaker and conduct an analysis of the variance between each production. I will then compare the variance that exists between each sound when produced by a native speaker and by a non-native speaker. Thus, the aims of this thesis are to (1) examine the intra-speaker variability in linguapalatal contact for native and L2 German speakers for the fricatives [ç], [x], and /ʃ/, and (2) examine the extent to which intra-speaker variability differs between native and L2 German speakers. I hope that addressing these research aims will lead to interesting and informative conclusions that can be helpful to both second language learners and future researchers.

Qualifications of Thesis Committee

- Honors Coordinator: Dr. David L. McPherson
- Faculty Advisor: Dr. Shawn L. Nissen
    - Dr. Nissen is an associate professor in the BYU Communication Disorders program who has specialized in the area of second language acquisition research for several years. Many of his recent works (both published articles and mentored master's theses) have been part of a collaborative project regarding the application of electropalatography in second language learning. I have worked in Dr. Nissen's lab for the past year as a research assistant and have aided in various aspects of these projects. Dr. Nissen's expertise in this specialized area of speech research will be invaluable for me as I complete this honors thesis.
- Faculty Reader: Dr. Katy Cabbage
    - I took both Language Development and Disorders of Articulation and Phonology from Dr. Cabbage last winter semester. She has extensive knowledge in the processes of language learning and acquisition, as well as expertise in the areas of literacy and language acquisition and phonological awareness. Her research and professional experience will help her to provide excellent insights as my faculty reader.

Project Timeline:

Proposal Acceptance Date - October 15

- Reading and resource gathering in the following areas:
  - Electropalatography technology and uses within the field of speech pathology
  - Normal speech production
  - Speech Production in second language learners
  - Variance in speech production
  - Previous studies conducted in Dr. Nissen's lab to create normative data
- Performing data processing to prepare data for analysis
- Preliminary drafting of methods section
- Complete IRB review for approval of secondary analysis of data

October 15th – November 15th

- Preliminary drafting of literature review/introduction section
- Preparing data for analysis
  - Creation of spreadsheets to run though MATLAB
- November 1st: First draft of literature review

November 15th

- First draft of thesis reviewed by faculty advisor (minus full results and discussion if not yet available)

November 16th - December 7th

- Revising first draft of thesis (structure/content editing – big picture)
- Additional reading if required for literature review
- Continued work on data analysis and interpretation
  - Creation of graphs/other data interpretation
- Preliminary drafting of results and discussion

December 10th

- Second draft of thesis reviewed by faculty advisor (including results and discussion if available)

January 7th- 31st

- Revising second draft of thesis (continued structure/content editing but beginning to work on small details)
- Additional reading/data analysis as needed
- January 15th – submit polished draft to Honors Coordinator and Faculty Reader for review

Feb 1st

- Final draft of thesis reviewed with faculty advisor

Feb 2nd - 18th

- Final revisions (fine detail revisions, as needed)

Feb 19th

- Submit finalized thesis and defense form

IRB or IACUC Approvals:

This thesis will draw from data previously collected in Dr. Nissen's lab over the last three years. Each of those projects have previously received IRB approval. I am currently processing a review with the IRB office in order to confirm that my secondary data analysis in this context is approved.

Funding

No funding is being requested for this Honors Thesis.

Culminating Experience

This project will represent a culminating experience for me as a BYU Communications Disorders undergraduate. I know that I have been fortunate to participate in the research community of our department because opportunities for research assistants are limited. This thesis will allow me to more fully understand the research process and apply that knowledge in my future career. While I have no definitive plans for my final paper (conferences, publishing, etc.), I know that it will be an asset to me as I apply to graduate schools in the fall and throughout the remainder of my career in this field.