An Exemplar-based Cross-Treatment Comparison of the Acquisition of the Spanish Vowel Space

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Introduction

- What makes a person sound native?
  - From previous work (part of which you heard earlier), there are many factors, both segmental and suprasegmental
  - VOT, Duration, Articulation of laterals,etc.
    - Focus on Consonantal variation

- One which has not been studied as in-depth is Spanish vowel acquisition
  - My personal interest is in vowel production and perception, so this seemed like an ideal fit

Research Questions

- Can learners acquire a more native-like vocalic system?
  - From the literature, we get mixed results
- How do they do it?
  - What processes are involved in the acquisition?
- Can instruction have an effect?
  - From the literature, the answer is yes
- What about Study Abroad programs?

Segment Studies

- Within SLA, and Spanish L2, there has been a long history of the study of the acquisition of segments
  - We have heard many good presentations, which also cite many others
- E.g. Flege's Speech Learning Model (1988, 1992, 1995, 1999a, 2002)
  - Learners' exposure to segments allows them to produce with greater accuracy
  - L2 speakers/learners are attuning to input
  - There is no definitive 'critical period'

Segment Studies - continued

- Direct instruction of segments has been shown to increase the native-likeness of learners' production

- Dalbor (1997), Elliot (2003), Gonzalez-Bueno (1997), Jenkins (2004)
  - These studies found that pronunciation classes and explicit instruction were beneficial to students, and their acquisition of non-native phones
    - Gonzalez-Bueno in particular found that direct instruction could help improve the production of stop consonants

Comparison Studies

- What would be a way to compare these findings?
- Direct instruction vs. Study Abroad (SA)
  - Can help develop curricula and understand relative efficacy of each
  - Study Abroad students are surrounded by native input
    - By receiving this input, they should improve
  - Pronunciation Classes receive intense, direct instruction on the articulation (and the phonology) of segments (among other aspects)
    - By focusing attention on segments (and other features), these students gain an awareness of pronunciation, and thus improve.
  - There have not been very many studies, at least with regard to Spanish, that have compared these two findings

Comparison Studies

- 3 studies included Spanish SA
- Simões (1996) – SA – Costa Rica
  - improvement after SA in pronunciation of syllable nuclei
- Lord (2000) – SA and SA/Pronunciation Class
  - Those with previous pronunciation class improved much more (28% vs. 5.8%) – focused on stop production
- Diaz-Campos (2004) – compared SA to Class
  - Mixed results – improvement in initial stop and word final laterals, but no change in intervocalic spirantization

Current Study

- My study follows in the same vein as Diaz-Campos (2004), with some differences
- I examine the vowel spaces of 3 groups pre- and post-treatment (vowel space defined by a F1/F2 plot)
  - SA Cohort – Summer Abroad with homestay
  - Pronunciation class – Spanish Phonetics/Pronunciation
  - Other Advanced – 300 level culture/civilization/literature
- Pre-and Post- vowel spaces will be compared to native norms
  - Quilis and Esgueva (1983)

Hypotheses

- Learners who participated in Study Abroad will show improvement in their post-treatment vowel space.
- Learners who explicitly studied pronunciation will show improvement in their post-treatment vowel space.
  - This group will show the most improvement.
- Learners from other advanced classes will improve, but not to the same level as the other two groups

Methodology

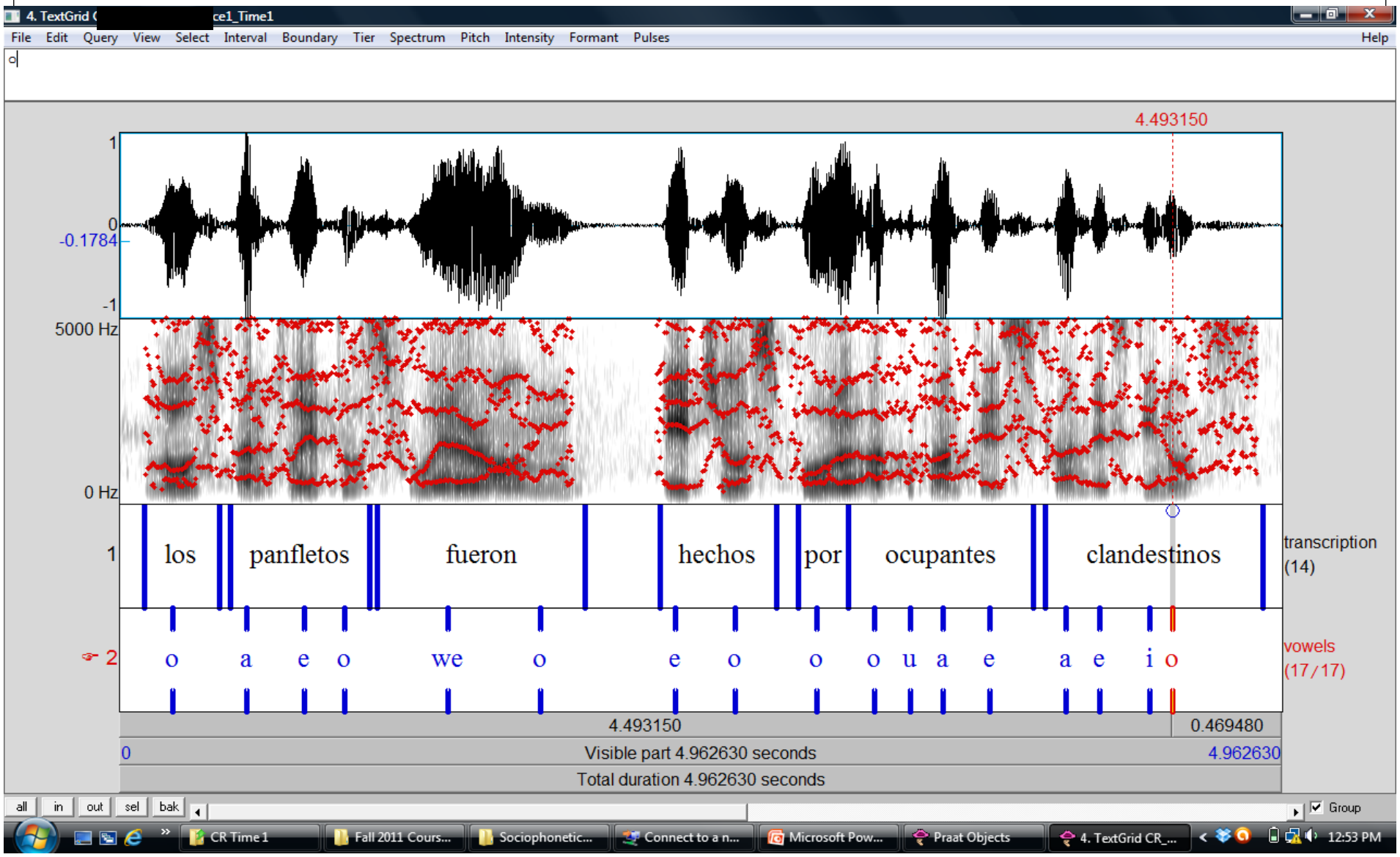
- Annotated corpus of student speech
  - Pre-and Post Treatment
- Extraction of vowels from both times of this corpus
  - 5 sentence continuous blocks that contained all five vowels
    - I excluded glides and diphthongs
- Extraction of the F1 and F2 values for each vowel
- Comparison of the space to Native norms

Participants

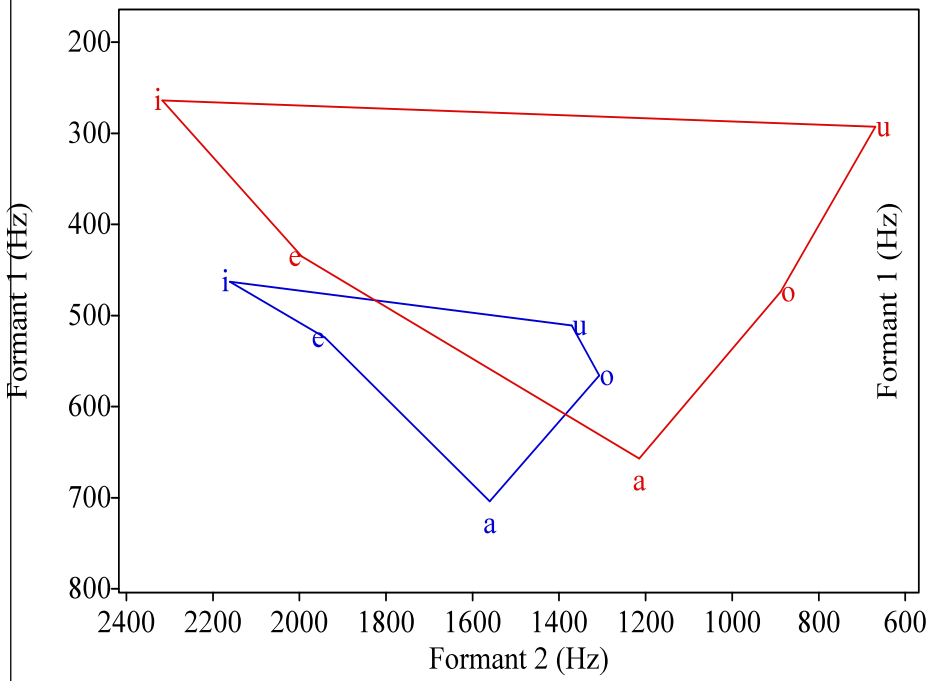
- 2 speakers from each Student Group
  - Study Abroad
  - Pronunciation Class
  - Other Advanced

- Randomly Selected from the Corpus
  - 1 Male/1 Female from each group

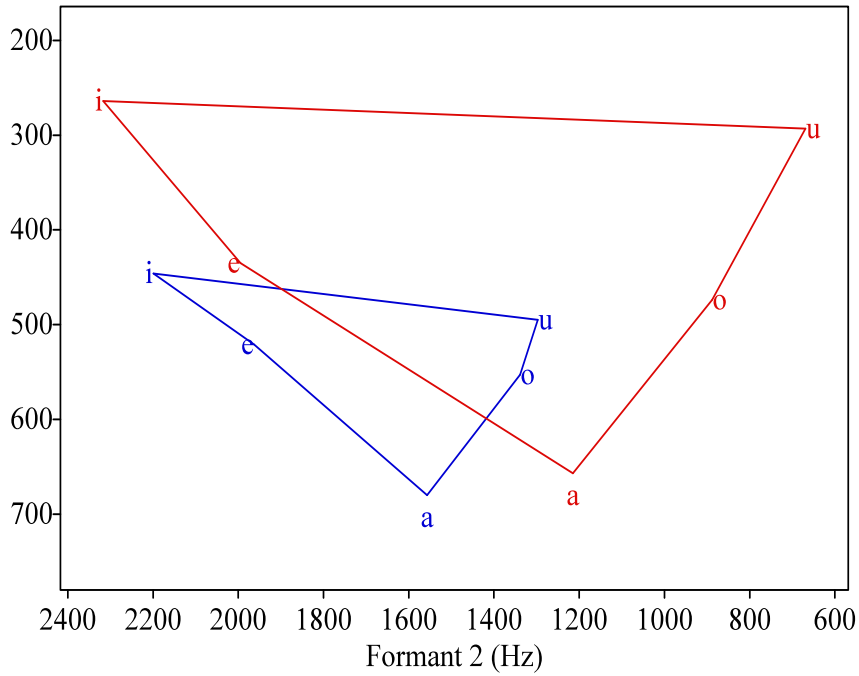
Example Textgrid



Results

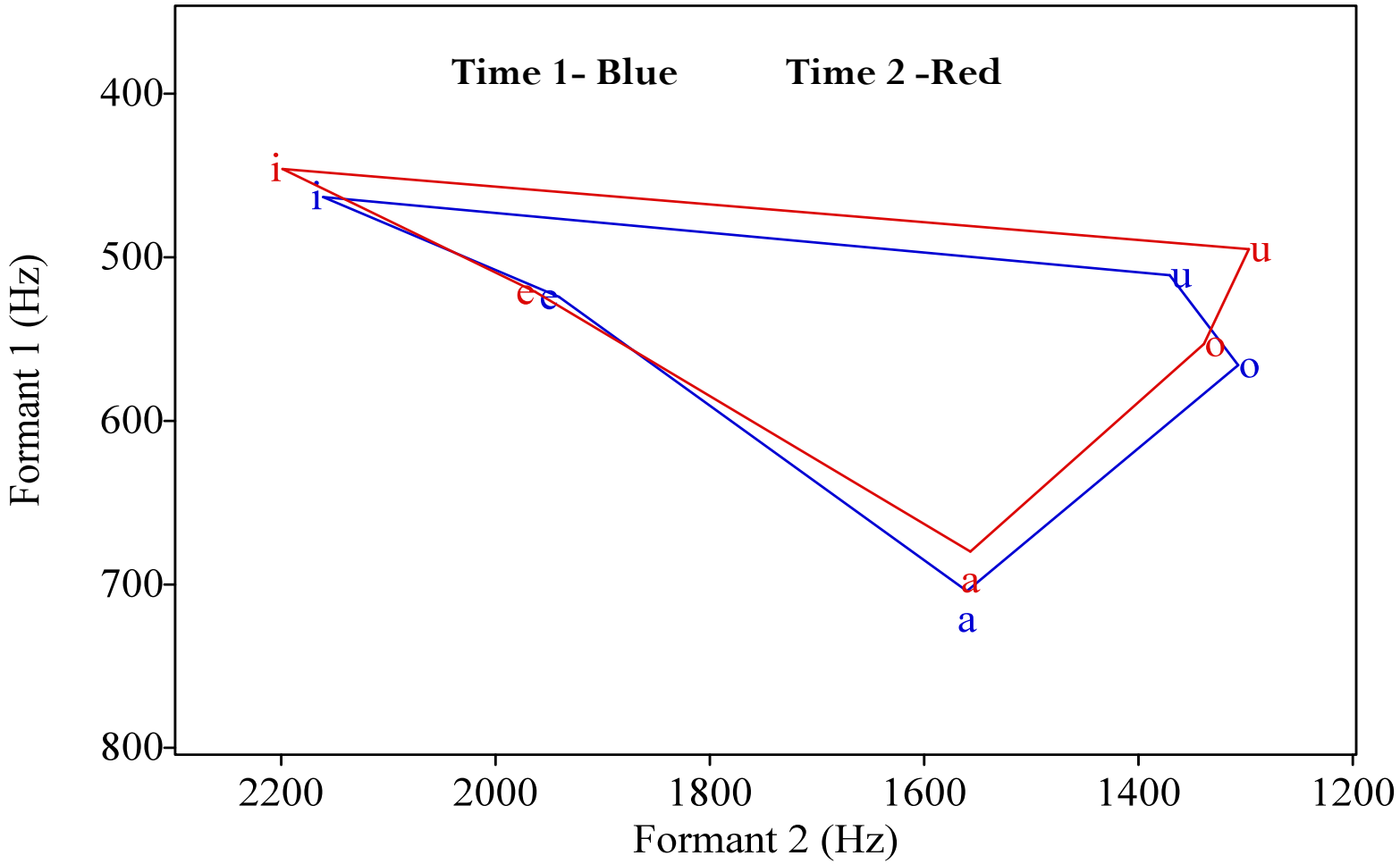


Overall Time 1



Overall Time 2

Results


Time 1- Blue
Time 2 -Red
400
500
600
700
800
Formant 1 (Hz)
2200
2000
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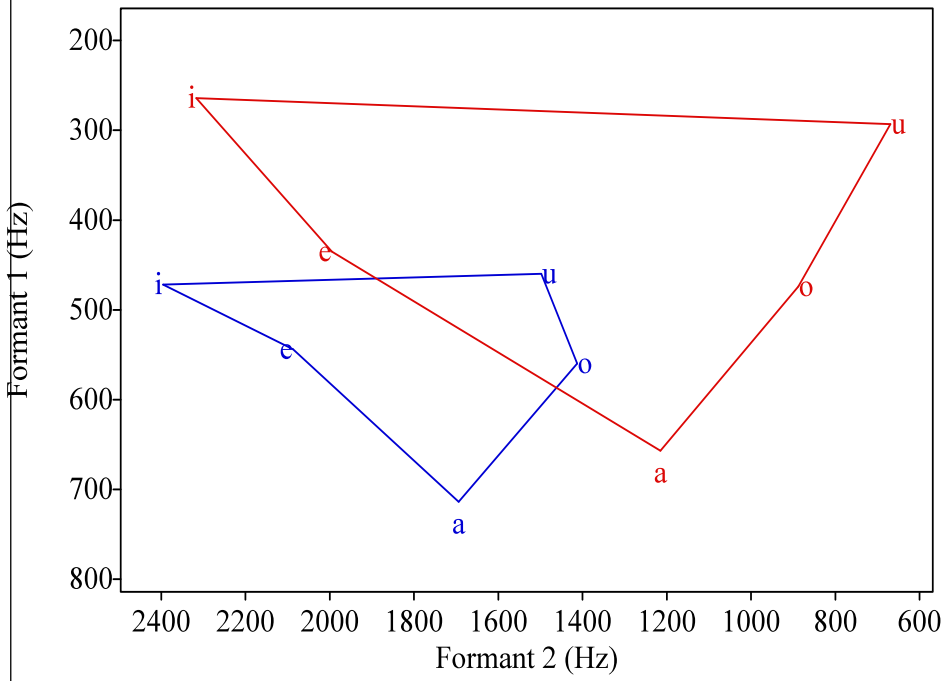
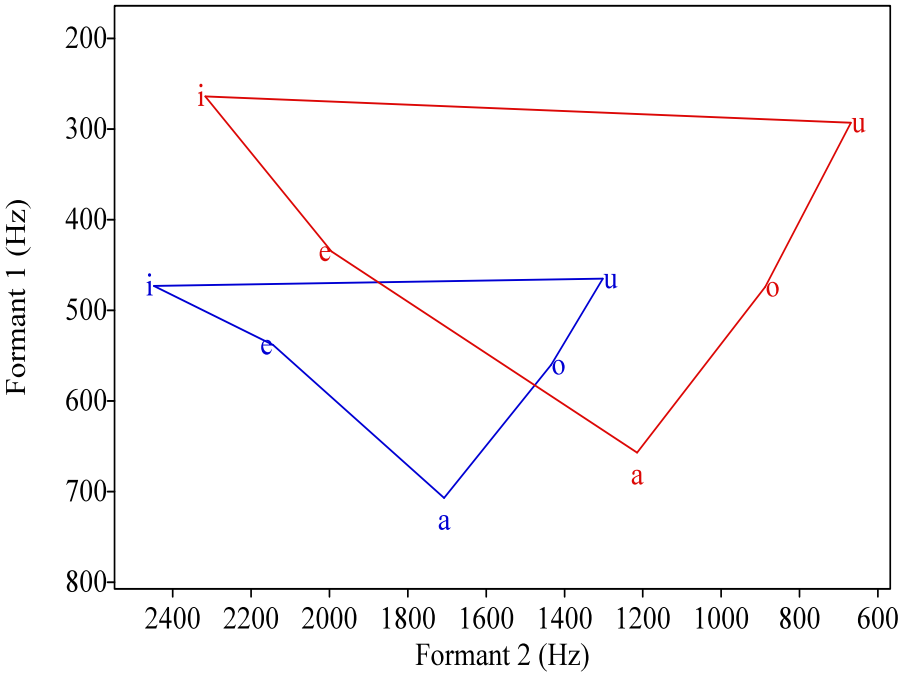
Group Results – Pronunciation Class

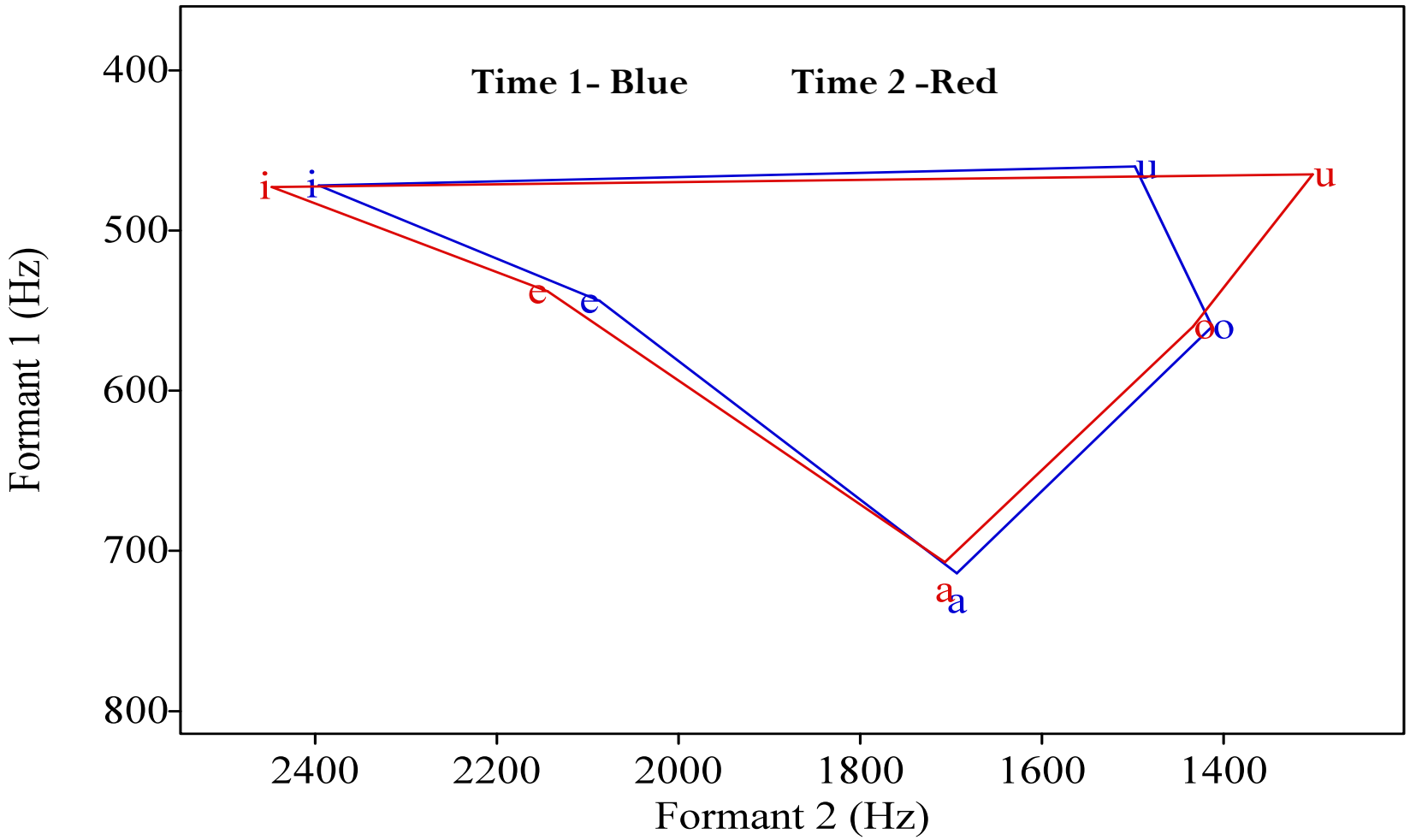


Pronunciation Time 1

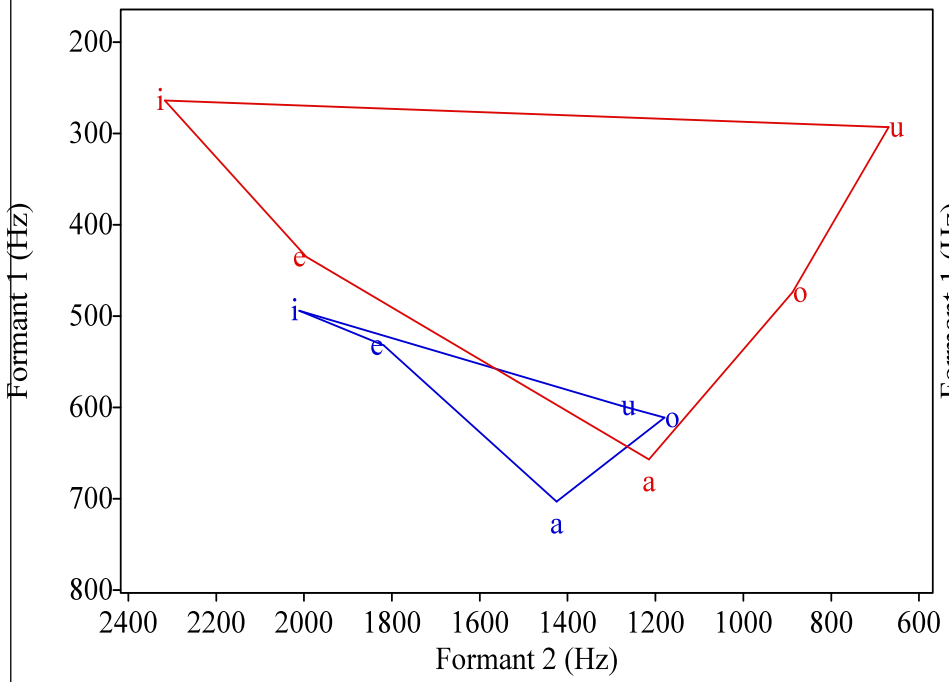


Pronunciation Time 2

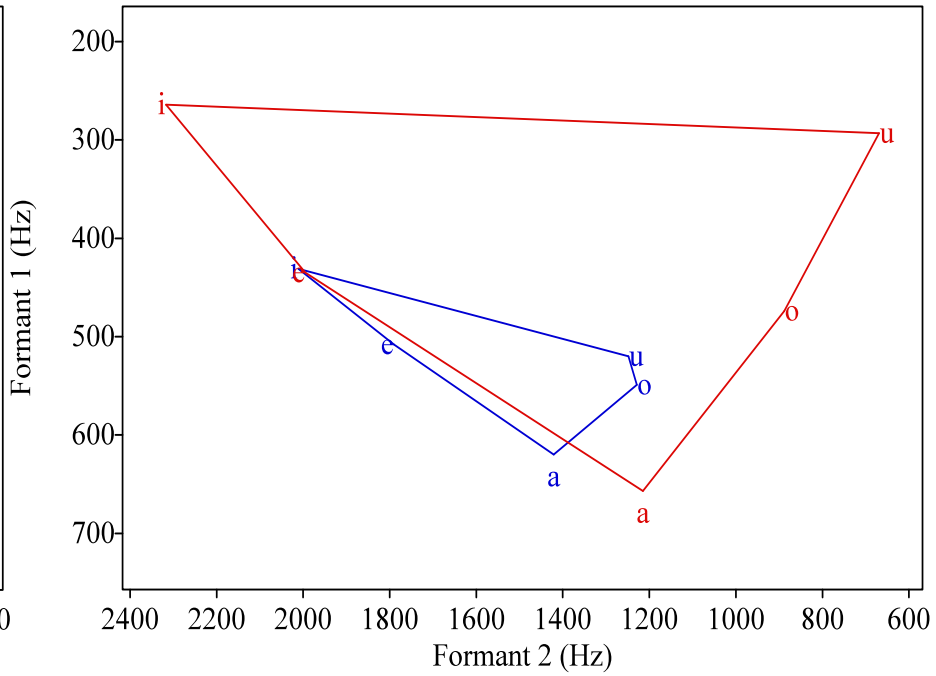
Group Results – Pronunciation Class



Group Results – Study Abroad

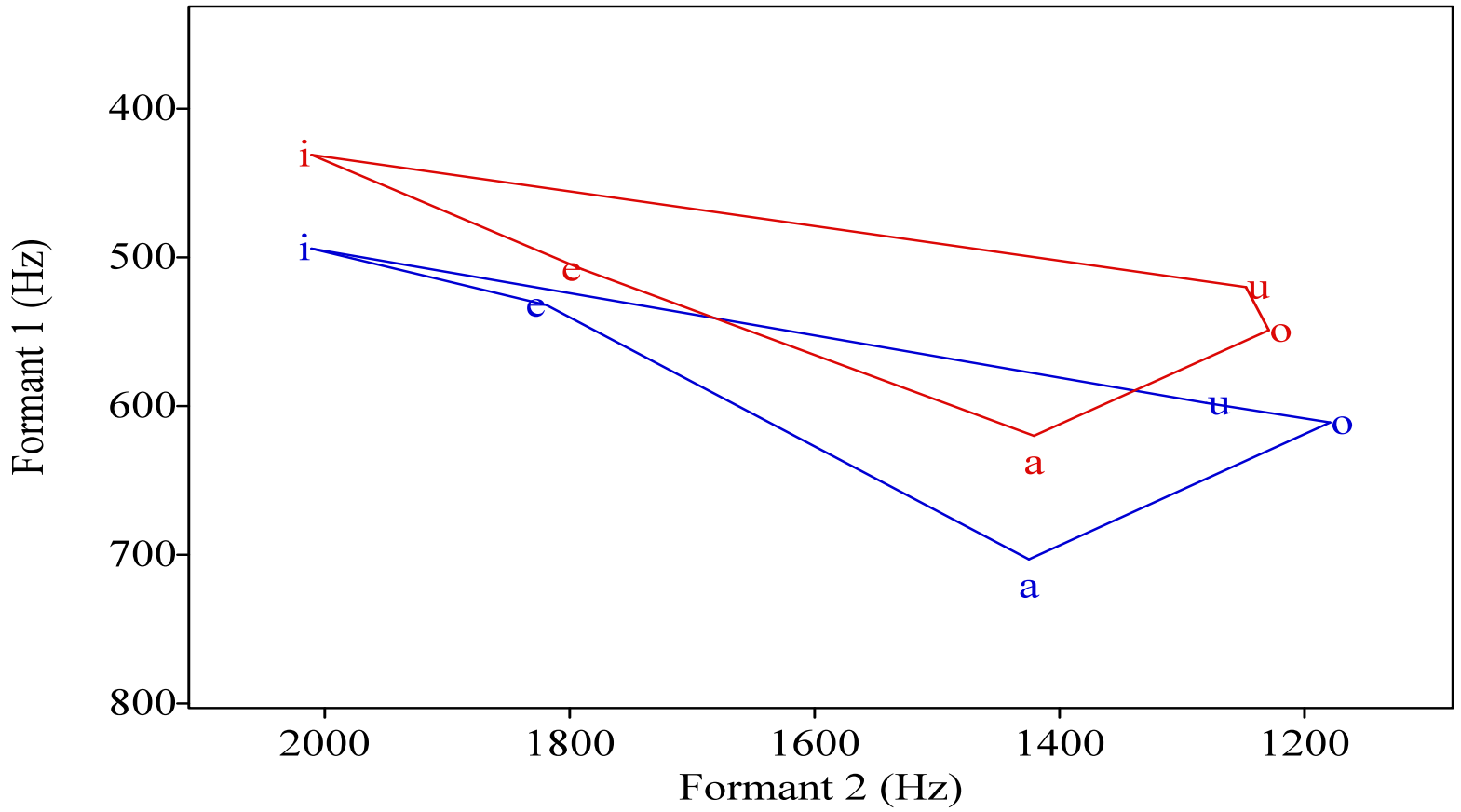


Study Abroad Time 1

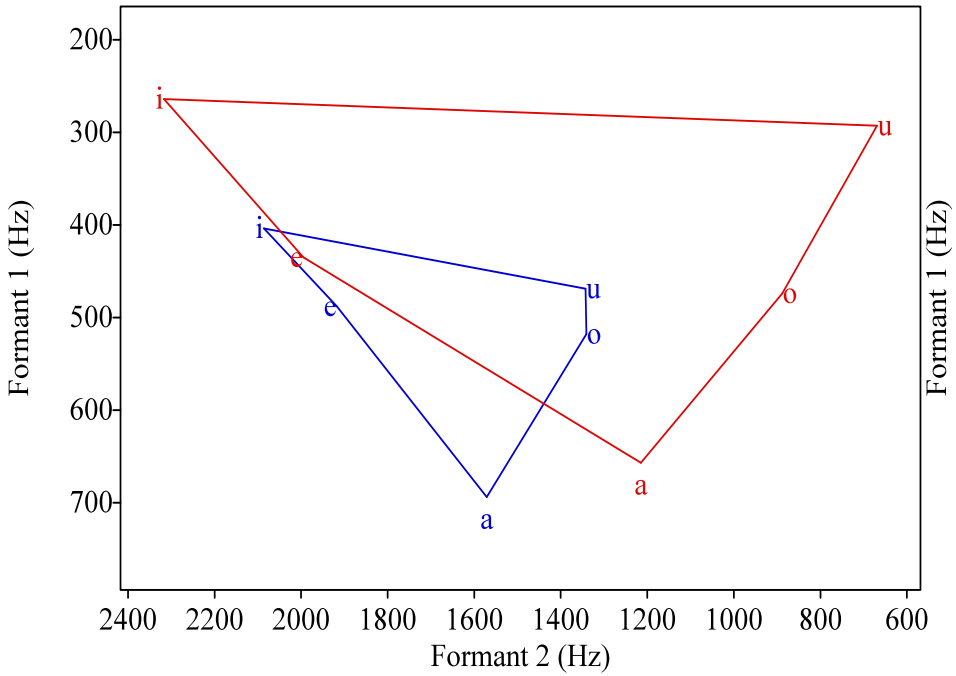


Study Abroad Time 2

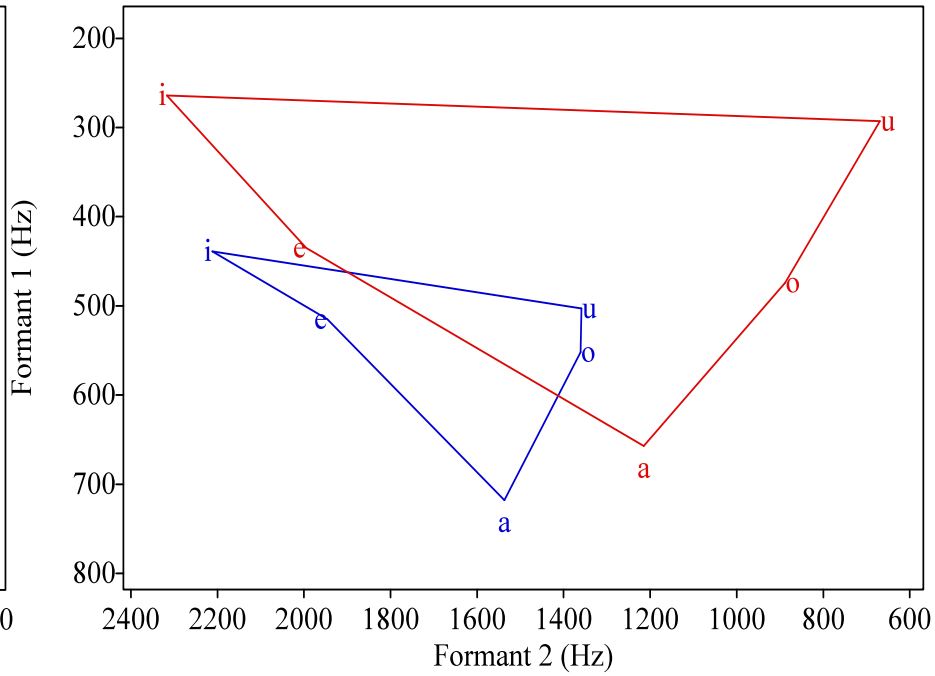
Group Results – Study Abroad



Groups Results – Other Advanced

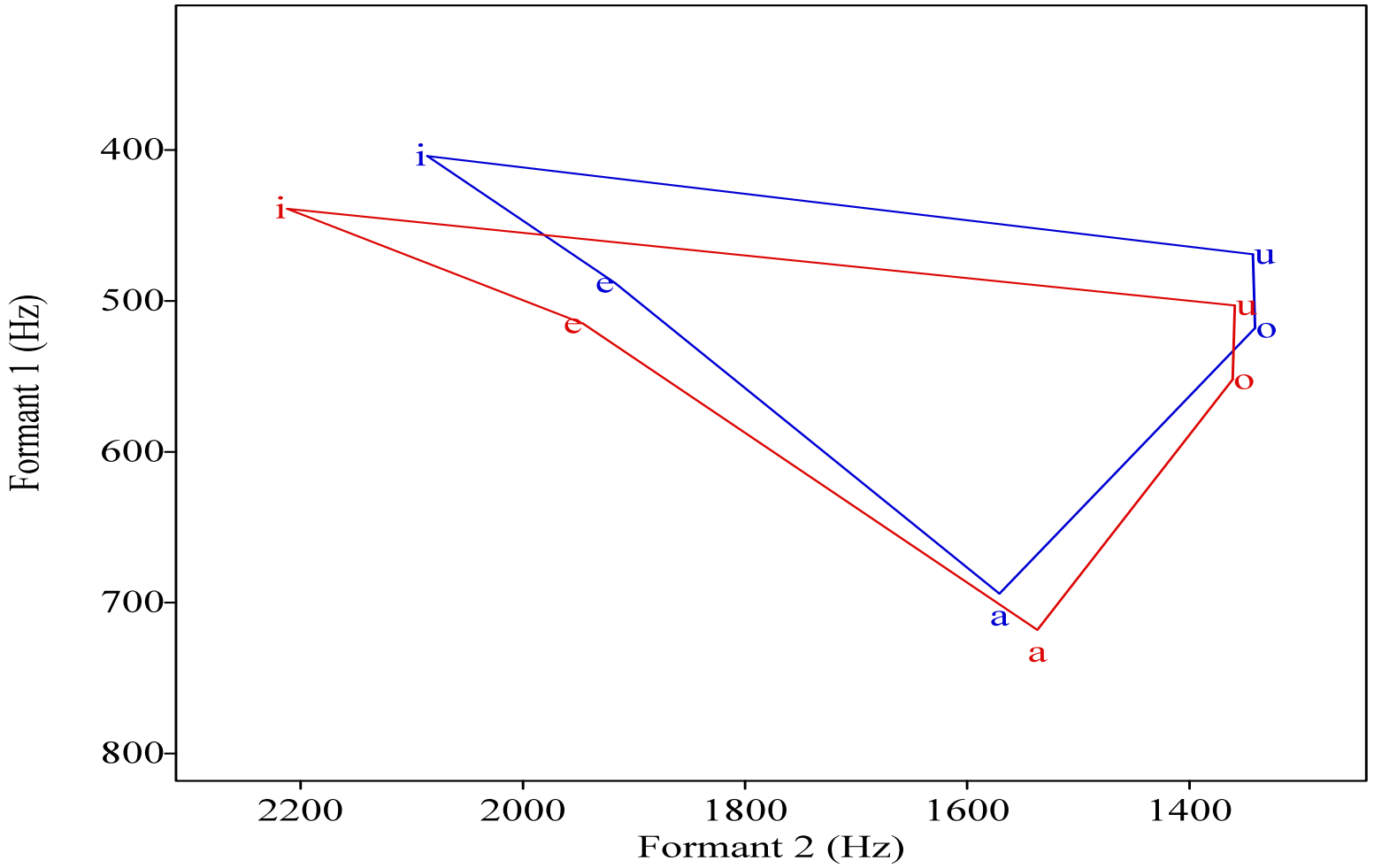


Other AdvancedTime 1



Other AdvancedTime 2

Group Results – Study Abroad



Statistical Results

- Two-Way ANOVA
  - Mixed Results
  - There was a significant result for time
    - $(F(1,2) = 4.52, p = .0203)$
  - But not for Group
- This means that the groups improved over the treatment, but there does not appear to be a difference between the groups

Conclusions

- Learners who participated in Study Abroad will show improvement in their post-treatment vowel space.
  - Hypothesis confirmed
- Learners who explicitly studied pronunciation will show improvement in their post-treatment vowel space.
  - This group will show the most improvement.
  - Confirmed, but was not the most
- Learners from other advanced classes will improve, but not to the same level as the other two groups
  - Not confirmed, same as other groups

Discussion

- So the question arises, why the similarity in the groups?
- Each made gains and improved after treatment, what would be the connection?
- I believe Exemplar Theory can help explain

Exemplar Theory

- ET is a probabilistic framework of perception and production
  - Boomershine (2006), Goldinger (1990, 1996, 1997), Goldinger et al. (1991), Johnson (1990, 1997), Pisoni (1990, 1992, 1997), Pisoni et al. (1985), and Pierrehumbert (2001, 2003)
- ET states that a learner stores a detailed record of input in the mental lexicon
  - Phonetic, phonologic, and social information
- As the learner is exposed to greater numbers of exemplars or pays closer attention to (Foulkes and Docherty 2006), greater phonetic detail is processed and becomes part of that representation.
  - Thus, as the input changes, the mental representation becomes more attuned to said input.

Applying ET to SLA

- When applied to SLA, ET would state that the greater the amount of native input or attention to native productions, the more native-like the representation
  - Thus, more target-like representations could be the basis for more target like production
  - With regards to the the current study, a more native-like vowel space
- Because of this, this could explain the gains made by the three groups.
  - SA- most input
  - Pronunciation Class – input combined with instruction (drawing attention to certain forms and their importance)
  - OA – input (but from one teacher)

Limitations

- Small Sample size
  - I only have 2 students per group
- Unknown amounts of other input
  - These were all Spanish majors and minors, so there may have been other input
  - Homestay situation for Study Abroad, Classroom environment for Other Advanced
- Generalizability
  - One student cohort from one university

Further Research

- More Data!
- Replicate the recordings
  - But with follow-up data
- Exemplar Theory
  - How do exemplars change?
  - How much input or attention is needed?
  - What teaching methods most effectively provide the necessary input or draw 'enough' attention?
- Why does fossilization occur?
  - Lack of attention?

Thank you!

Comments and Questions welcome:

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