ON PERCEPTION AND FEEDBACK FACILITATING PRODUCTION IN SECOND LANGUAGE PHONOLOGY

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Abstract

Within the domains of phonetics and speech perception, the role of exposure to perceptual input in the acquisition of target-language sounds has been widely recognized (see Flege, 1995). The current study examines how exposure to L2 sounds along with metalinguistic explanations and online pronunciation tasks assigned as homework positively impacted students' ability to produce L2 phones. Participants (n=12) were students of a college level Intermediate Spanish Conversation course and were divided into three experimental groups. Group A received perceptual input online in the form of sound files and then completed language discrimination tasks. Group B completed the same tasks without perceptual input, but was provided with additional metalinguistic explanation on how to produce the target sounds. Group C served as the control group. Initial data analysis indicates that Group A improved the most in their Spanish perception and also production, suggesting that exposure to input and metalinguistic explanation aid in the production of L2 phonology. Furthermore, the results have pedagogical implications, as any L2 instructor looking to incorporate pronunciation learning in their course can adopt the methodologies used.

Keywords: Second language acquisition, phonetics, perception, exposure to target language

Introduction

A common question in second language acquisition research has to do with whether the ability to perceive novel speech sounds in a second language aids in a learner's production of these sounds. The study presented here aims to add to the literature on this subject by showing how extended exposure to examples of second-language speech has improved the pronunciation of beginning learners of Spanish. By manipulating the students' exposure to perceptual input, corrective feedback, and metalinguistic explanation, second language learners were able to improve not only their perception of L2 sounds, but also their production. We will begin by briefly discussing accentedness, the role of extended exposure, perception, and explicit instruction in phonological acquisition.

Background

The proper pronunciation of speech sounds in a second language is of great importance to many language learners; however, it is common that learners of a second language will have a non-native accent if they begin learning another language as an adult (Moyer, 1999). Many of those who wish to achieve a high level of proficiency in another language also seek to minimize the presence of any non-native features in their L2 speech. There are valid reasons for attempting to hide non-native speech features as attitudes towards non-native speech have historically been negative. The detection of a foreign accent occasionally has been used as a discriminatory tactic at various points throughout history as well as in everyday life, and at some points even resulting in the loss of life (McNamara 2005). Research has long found that there is a bias in favor of the "standard" dialect of a language, a fact that has been found across languages and can vary further according to the background of the listener (Ryan, Carranza et. al. 1977; Brennan and Brennan, 1981). Moreover, detection of an accent is almost immediate, with research showing that listeners are able to detect an accent in speech segments as short as 30 milliseconds (Flege, 1984) and speakers are highly attuned to the properties of accentedness (Magen, 1998). However, despite the quickness with which one's accent is noticed and the myriad of attitudes associated with non-native speech patterns, little classroom time is devoted to second language pronunciation instruction, particularly in the elementary and intermediate levels (Elliot, 1995a; Lord, 2010).

Reasons for a lack of pronunciation teaching at the classroom are due to several factors, for example, there is debate concerning the effectiveness of extended exposure on learning novel or challenging second language speech sounds. Also, it has been found that improvement of novel speech sounds can sometimes depend on the sounds involved. Looking first at how extended exposure can affect pronunciation, a valuable source can be found in study abroad research. In a 2004 study, Díaz-Campos investigated possible improvements of the speech of students who had studied abroad to those who only studied in a classroom environment. This experiment analyzed the speech of 46 university-aged second language learners of Spanish, 26 of whom had participated in a study abroad program and 20 who only studied in a classroom environment and looked particularly at their pronunciation of commonly problematic sounds in the Spanish language. These sounds included the voiceless stops [p,t,k], the voiced fricatives [β,ð,γ], the liquid consonant [l], and the palatal nasal [ɲ]. The study abroad students were participants in a 10-week study abroad program in Alicante, Spain and the classroom students were aged from 17 to 42 (the majority of participants were in their early 20s). Students read a text which included target-words that contained the sounds under investigation both before and after the treatment phase of the experiment. The results found that overall, while non-native speech patterns still dominated their speech, the study abroad group did see improvements over time for the voiceless stops and the liquid [l]. However, no improvement was found for the voiced fricatives or the palatal nasal (which was produced correctly by the majority of participant at the pretest phase). Similar results were found in Lord (2010), who looked at improvements by students who participated in a two-month summer immersion program in Mexico. She analyzed students' production of the voiced stops [b,d,g] and the voiced fricatives [β,ð,γ]. Participants read a list of sixty words and phrases before and after the immersion program; accuracy of pronunciation was expectedly high, yet accurate pronunciation of voiced fricatives didn't even reach a 25% accuracy rating in her study. However, another component of her study, the effects of pronunciation instruction on production accuracy, yielded results that appear to confirm the usefulness of teaching pronunciation in the classroom. Half of the participants in her study had taken a course in Spanish phonetics prior to the study abroad program. These participants saw significant improvments in their production of the voiced fricatives after the immersion program. Many articles have also been written on the (lack of) benefits of explicit pronunciation instruction on language learners with regard to morphosyntax (Sanz and Morgan-Short, 2004; Van Patten and Oikennon, 1996; Wong and Van Patten, 2003). However, much fewer (like Lord discussed above) have been carried out regarding second language phonology and explicit instruction / metalinguistic explanation, showing explanation is indeed helpful in the production of second language sounds (DeWilde, 2009; Huthaily, 2008).

Significant contributions have also been made regarding the effects of perceptual input to the improvement of L2 phonological production (Bradlow et. al., 1997; Counselman, 2010). One such study was by Wang and colleagues (2002), in which sixteen native speakers of American English were trained in the perception of 4 Mandarin tones over a two week period, with pre- and posttests. Analysis of the data showed not only improvement in the learners' perception of all 4 tones, but in their production as well, without any type of production training. Furthermore, the improvement was extended to novel stimuli which was not used in the perception training. These results also indicate that the effect of training in perception transferred to the production domain. Additionally, there are several useful findings within the field of speech-language pathology. The findings of Rvachew et. al. (2004) support the hypothesis that perceptual input may be key in production, as it was noted that perception training aided in the sound perception of problem sounds (a series of several consonants) and in articulatory accuracy in children with phonological disabilities, compared to those subjects who received only traditional speech therapy.

Current Study

The current study took place during fall 2007 at Pennsylvania State University. Participants were solicited from every section of an intermediate-level Spanish conversation course, and were divided into three experimental participant groups (n=12). At the beginning of the experimental period, participants came to the univeristy's Language Processing Lab, at which time, participants completed IRB paperwork, Language History Questionnaires (LEAP-Q, Marian et. al., 2007) and the Pronunciation Attitude Inventory (Elliot, 1995b). Participants then completed the pretest in L2 speech perception and production skills. A *.wav* file lasting no longer than 30 ms. was provided, consisting of various (lateral)-vowel-lateral combinations (i.e. [al#], [ol#], [ul#][1]). Participants were required to determine whether the sounds they heard were English (option A) or Spanish (option B). This speech discrimination task comprised twenty questions; participants then completed a word-naming task in which they were required to produce L2 words which appeared randomly on the computer screen. All tokens from the list contained the [l] allophone in various positions. The word naming tasks were digitally recorded and analyzed using Praat Phonetics software.

For an eight-week period, Group A (n=4) completed tasks in first and second language (L1 and L2 respectively) speech discrimination using the university's online course management system. Each weekly task was made up of twenty questions similar to those of the pretest. After the task, participants were able to see their results. Group B (n=4) completed the same discrimination exercises as Group A, but did not receive feedback on their language perception 'quizzes'. However, participants were provided with an additional metalinguistic articulatory explanation in prose of lateral coda velarization in English (and other phonological differences between English and Spanish, discussed below), accompanied with additional sound files. Group C (n=4) served as the control group, receiving short listening passages about the economies of various Latin American countries. They also completed the twenty-question discrimination task, but did not receive feedback. The following table summarizes the participant groups.

Table (1): Participant Groups

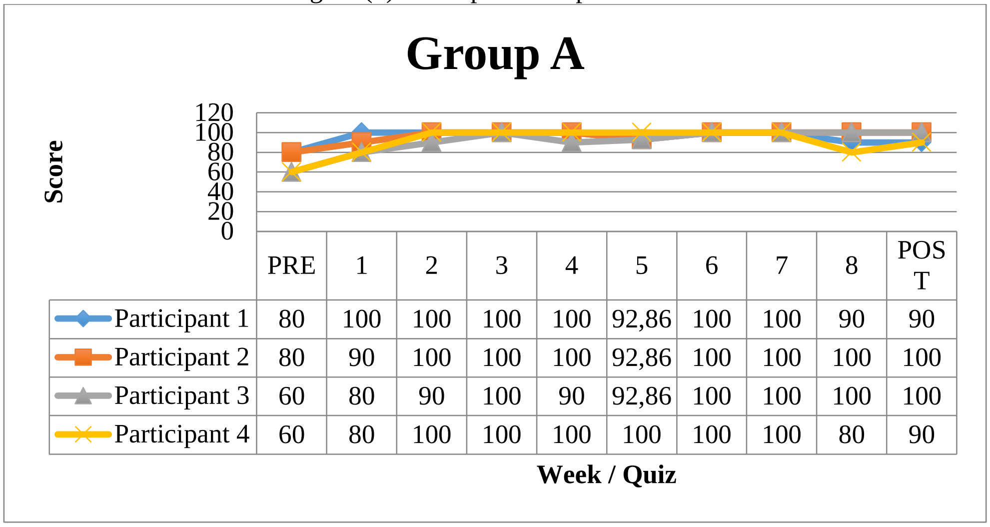
Group	Type of linguistic exposure
	Language discrimination tasks *(received feedback from tasks)* + Additional metalinguistic explanation
B	Language discrimination tasks *(no feedback)* + Additional metalinguistic explanation
C	Control (Language discrimination tasks, *no feedback)*

The tasks in this study focused on the non-velarized coda [l] of L2 Spanish. In both English and Spanish, the consonant [l] surfaces in the coda position of the syllable, however, in English when the [l] appears in the syllable final position the phone is velarized, surfacing as [ɫ] (Giegerich, 1992; Ladefoged & Maddieson, 1996). This process does not occur in Spanish (Harris, 1969; Lipski, 1994; Núñez Cedeño, & Morales-Front, 1999), although there are varieties of contact Spanish in which and circumstances under which a velarized [ɫ] allophone may be produced (Bullock et. al.; 2004). The velarization of the [l] allophone can be easily dectected with acoustic analysis by looking at the F2 frequency (Ladefoged 2003:147); the non-velarized variety of [l] has an F2 that resonates around 1200 Hz and its velarized counterpart has an F2 at aproximately 800 Hz.

Results

In Figure (1) we see the speech discrimination scores of Group A. During the pretest, two participants scored at 60% (items discriminated correctly) and two at 80%. After the first week, one participant scores at 90%, with the other three at 100%. Scores remain at 90% or above for all participants (except for Participant 4 during week 8). The posttest scores show us that two participants scored at 90%. The posttest scores compared to the pretest scored show that Group A improved in their L2 speech discrimination abilities.

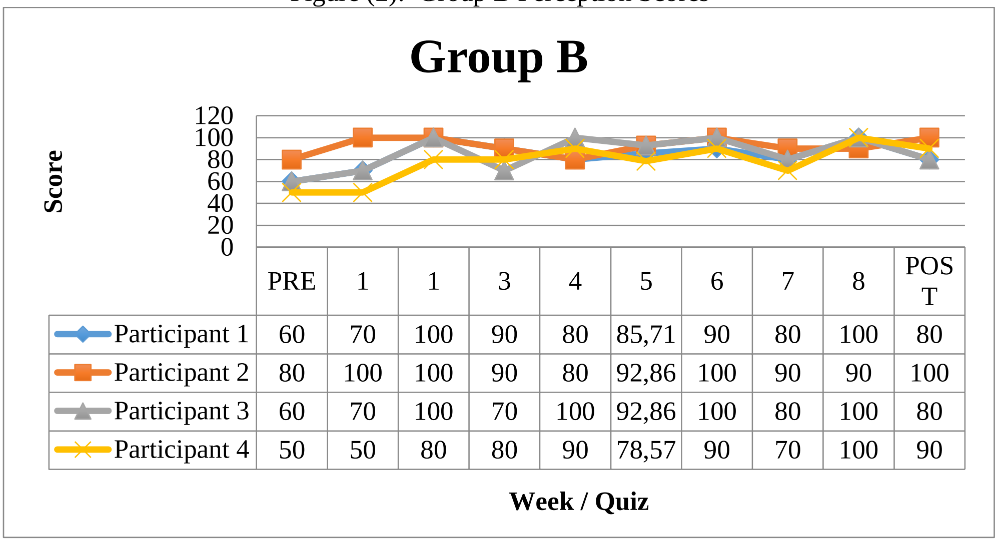
Figure (1): Group A Perception Scores



	PRE	1	2	3	4	5	6	7	8	POST
Participant 1	80	100	100	100	100	92,86	100	100	90	90
Participant 2	80	90	100	100	100	92,86	100	100	100	100
Participant 3	60	80	90	100	90	92,86	100	100	100	100
Participant 4	60	80	100	100	100	100	100	100	80	90

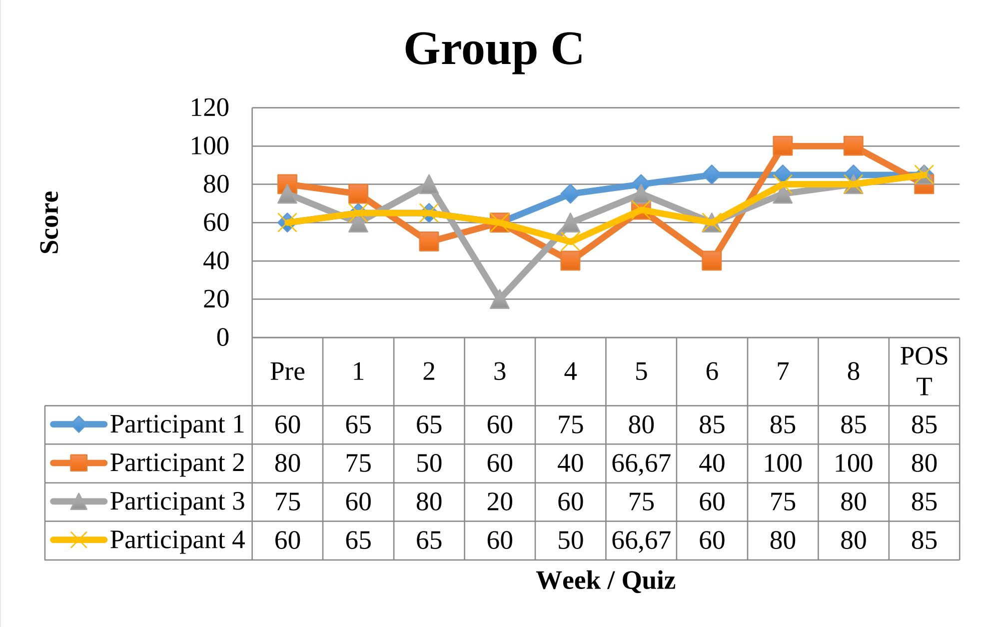
In Figure (2), we note that the pretest scores of Group B are slightly lower than that of Group A, with one participant scoring at 50%, two at 60% and one at 80%. Over the eight week period, we can note improvement in all four participants, but the improvements are not as drastic compared to those of Group A. During the posttest, we see that two participants scored at 90% and the other two scored 100%. Finally for Group C (the control group), we note that the pretest scores again range from 60% to 80%. Over the eight-week period, there is no significant weekly improvement when compared to the performance of Groups A and B. During the posttest one participant scored 80% and the other three 85%. Group C did improve, but not to the degree of the other two groups.

Figure (2): Group B Perception Scores



	PRE	1	1	3	4	5	6	7	8	POST
Participant 1	60	70	100	90	80	85,71	90	80	100	80
Participant 2	80	100	100	90	80	92,86	100	90	90	100
Participant 3	60	70	100	70	100	92,86	100	80	100	80
Participant 4	50	50	80	80	90	78,57	90	70	100	90

Figure (3): Group C Perception Scores



	Pre	1	2	3	4	5	6	7	8	POST
Participant 1	60	65	65	60	75	80	85	85	85	85
Participant 2	80	75	50	60	40	66,67	40	100	100	80
Participant 3	75	60	80	20	60	75	60	75	80	85
Participant 4	60	65	65	60	50	66,67	60	80	80	85

After the eight-week experimental period, students returned to the lab and completed the posttest, which consisted of the identical speech perception and production tasks of the pretest. When we examine the L2 language production results, we notice behavior perhaps not expected. Group A was already producing a high F2 during the pretest, and during the postest produced target-like allophones.

Figure (4): Group A Production Scores

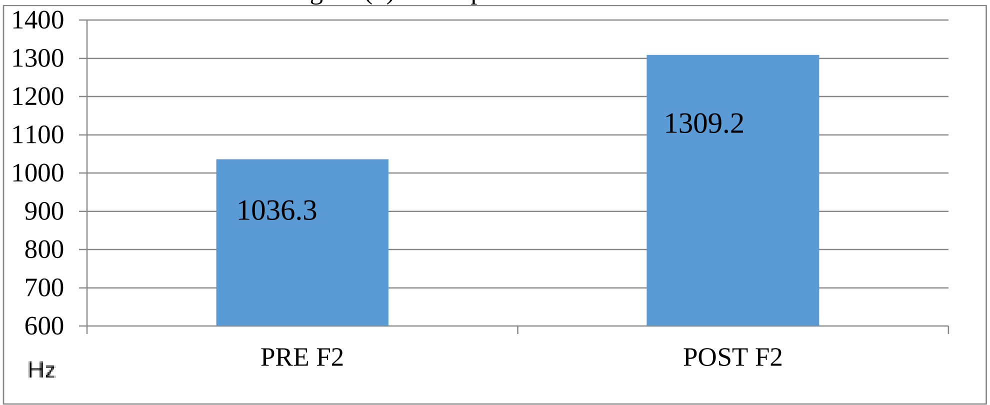


Figure (5) shows us that Group B participants were producing more L1-like allophones during the pretest, and improved their production of L2 allophones with a mean Hz frequency of approximately 1000. However, the more curious results are displayed by Figure (6); the production of the control group. During the pretest and posttest participants were producing allophones with a Hz of approximately 1400 (i.e. they were producing allophones with frequencies higher than those typical of the target-language sounds).

Figure (5): Group B Production Scores

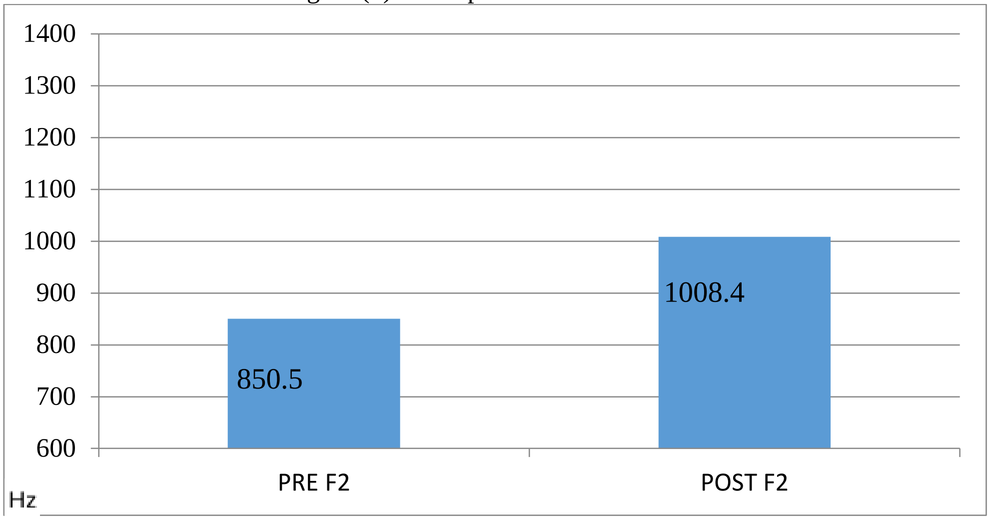
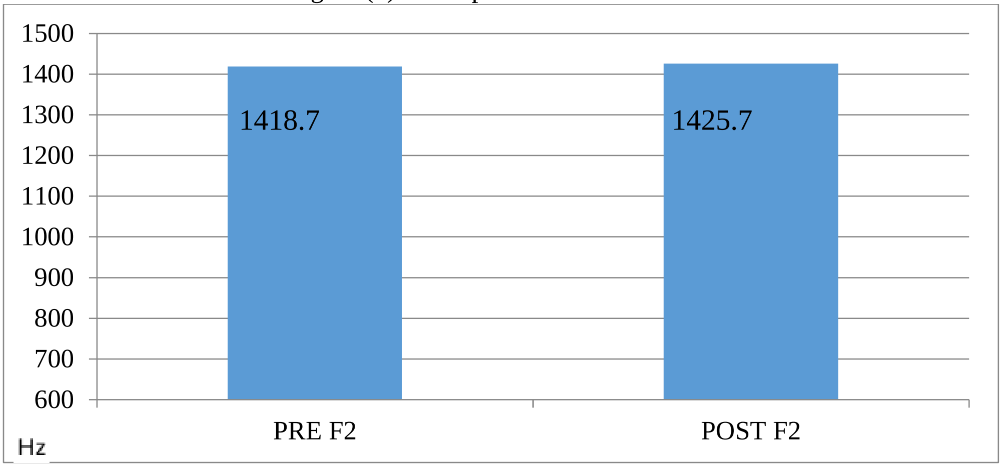


Figure (6): Group C Production Scores



Conclusion

This study aimed to investigate the roles of discrimination tasks (in the form of speech perception) and metalinguistic explanation in the improvement of production of second language sounds. With regards to language discrimination abilities, experimental groups receiving feedback from their perception tasks as well as metalinguistic explanation displayed improved performance throughout the experimental eight-week period. However, with regards to L2 speech production, results were not as promising: Group A produced an F2 higher than normal during the pretest and Group C producing an F2 with even higher frequencies. More conclusive results will undoubtedly be yielded by increasing the number of participants, as well as the number of speech perception exercises given through the experimental period. It will also be beneficial to isolate the aforementioned variables (exposure to target language, discrimination tasks, and metalinguistic explanation) into their own subject groups.

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