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The role of instruction in the perception of English high back vowels

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Abstract

This article aims to analyze whether formal instruction influences Brazilian speakers' perception of the English high back vowels contrast. There have been a few L2 pieces of research that focused on the instruction of specific vowel contrasts. Previous studies indicate that a single L1 category seems to be a source of difficulty to L2 vowel discrimination. However, some of these investigations did not focus on the role of instruction to such discrimination. The participants of the present study were 17 Brazilian speakers of Portuguese as L1, beginning learners of English, divided into experimental and control groups. The study included a perception pretest, a pronunciation instruction class, taught only to the experimental group, and a perception posttest. Results showed that experimental and control groups obtained similar results. Based on that, some factors were pointed to possibly explain this outcome, such as the duration of the pronunciation instruction, the possibility of participants learning with the pretest itself, the duration of the data collection, the participants' possible assimilation of the target contrast into a single category, and the interference of the mid central vowel /ʌ/ used as a distractor in the data collection. On the other hand, a qualitative analysis revealed that all participants in the experimental group found the pronunciation instruction helpful. Such findings seem to agree entirely or in part with other similar studies' results.

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Resumo

O objetivo deste trabalho é analisar se a instrução formal influencia a percepção de falantes brasileiros em relação ao contraste das vogais posteriores altas do inglês. Até o momento, poucas pesquisas de L2 focaram na instrução de contrastes de vogais específicas. Estudos anteriores indicam que uma única categoria na L1 parece ser uma fonte de dificuldade para a discriminação de vogais na L2. No entanto, a maior parte dessas investigações não consideraram o papel da instrução para a aprendizagem da discriminação vocálica. Os participantes do presente estudo foram 17 alunos iniciantes de inglês, falantes nativos de português brasileiro, divididos em grupos experimental e de controle. O estudo incluiu um pré-teste de percepção, uma aula de instruções de pronúncia, voltada apenas ao grupo experimental, e um pós-teste de percepção. Os resultados mostraram que os grupos experimental e de controle obtiveram resultados semelhantes. Por esta razão, alguns fatores foram apontados para possivelmente explicar tal resultado, tais como a duração da instrução de pronúncia, a possibilidade de os participantes aprenderem com o pré-teste em si, a duração da coleta de dados, a possível assimilação do contraste alvo em uma categoria única e a interferência da vogal central /ʌ/, usada como distrator na coleta de dados. Por outro lado, a análise qualitativa revelou que todos os participantes do grupo experimental acharam a instrução da pronúncia útil. Tais resultados parecem concordar total ou parcialmente com outros estudos semelhantes.

Palavras-chave: Vogais posteriores altas do inglês; percepção; instrução da pronúncia.

Introduction

The history of teaching the pronunciation of English as a foreign language has come a long way.[1] Since the beginning of the 80's, research has indicated mixed results concerning the effectiveness of pronunciation teaching;[2] thus, more research in the field is welcome. Although empirical research can rely on quantitative measures (e.g., sound duration, formant frequencies), pronunciation teaching is highly guided by the qualitative nature of pronunciation, which is different from grammar and vocabulary as it involves sensory (auditory perception) and physiological skills (articulation)[3] that pose a challenge for its teaching.

As well as teaching pronunciation, listening in a foreign language is also a complex task. It involves perception and compre-

1. Ashby and Przedlacka, "Towards a history of teaching, learning and assessment in phonetics" (2013); Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants" (2004).

2. Silveira, *The influence of pronunciation instruction on the perception and production of English word-final consonants* (2016).

3. Celce-Murcia, "Teaching pronunciation as communication" (1987).

hension, and it requires the interaction between top-down and bottom-up cognitive processes.[4] Moreover, research with bilinguals has shown that the listener's L1 has an impact on L2 perception and production.[5] This phenomenon is described in the literature as cross-linguistic influence (CLI), transfer or interference, and it plays a central role in L2 phonological acquisition.[6]

An area that has received significant attention from researchers within CLI is the listener's use of L1 categories for their L2 discrimination.[7] Some of these studies have focused specifically on the discrimination of English vowels,[8] concluding that a single L1 category seems to be a source of difficulty to L2 vowel discrimination, given that the assimilation of two L2 categories into a single L1 category has a negative impact on L2 perception and possibly production. These investigations, however, do not consider the role of instruction to such discrimination, and contemplate at least three or all English stressed monophthongs, differently from this study, which focuses on the role of instruction in the discrimination of the English high back vowels. For example, Nobre-Oliveira's[9] doctoral dissertation dealt with the instruction of /i/, /ɪ/, /ɛ/, /æ/, /ʊ/ and /u/. Wong[10] focused on both English high front and high back vowels; and Linebaugh[11] worked with articulatory training for three English contrasts: /æ, ʌ/, /ɜ, ɔ/.

Bearing in mind the need for more research that investigates the role explicit instruction plays in the learners' discrimination of high back vowels, the objective of the present study is to analize whether formal instruction influences Brazilian speakers' perception of the English /ʊ, u/ contrast. In order to do that, the following research question is addressed:

RQ: Does a limited amount of formal instruction influence Brazilian speakers' perception of the English high back vowels contrast?

This paper is based on the hypothesis that perceptual accuracy of English high back vowels will improve after learners receive a limited amount of formal instruction.

4. Vandergrift, "Listening to Learn or Learning to Listen?" (2004).

5. as seen in Colantoni et al., *Second Language speech: theory and practice* (2015); Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants" (2004); and Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

6. Colantoni et al., *Second Language speech: theory and practice* (2015).

7. Brown, "The role of the L1 grammar in the L2 acquisition of segmental structure" (1998); Flege, "The production of "new" and "similar" phones" (1987); Lado, *Linguistics across cultures* (1957); Rauber et al., "The interrelation between the perception and production of English vowels by native speakers of Brazilian Portuguese" (2005); among others.

8. Rauber et al., "The interrelation between the perception and production of English vowels by native speakers of Brazilian Portuguese" (2005); Rauber, "Perception and production of English vowels by Brazilian EFL speakers" (2006).

9. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007).

10. Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

11. Linebaugh and Roche, "Evidence that L2 production training can enhance perception" (2015).

Review of Literature

The focus of this section is to present some theoretical background on pronunciation instruction and the English high back vowels. In the first part, the teaching of pronunciation is explored; in the second, studies that work with the target vowels of this piece of research – English high back vowels - are examined.

Teaching Pronunciation

Throughout the twentieth century, teaching pronunciation has either: (1) occupied a place of prominence, according to the method or approach to language teaching popular at the time, for instance, the audiolingualism - middle of the 20th century -[12] that emphasized the importance of pronunciation from the beginning, as the goal was to "get students to mimic native speaker speech as closely as possible"[13] (p. 374); or (2) it was relegated to a second plan, for example, in the Cognitive Approach, which is based on the notion that language is governed by rules and learners have to master these rules in order to communicate in meaningful situations. More recently, the communicative approach, which focuses on the functions and use of the language,[14] has given pronunciation and its teaching a relevant role again, although a native like pronunciation is no longer the goal. As Silveira[15] points out, "intelligible pronunciation, rather than total accuracy" (p. 34) is the objective.

However, there seems to be a lack of explicit pronunciation instruction in the communicative approach textbooks according to Silveira[16], who argues that this may be due to "teachers' deficient training in this area, as well as to a prevailing skeptical view of the effectiveness of any explicit teaching" (p. 57). Having this in mind, it is important to review some empirical studies that dealt with teaching pronunciation to examine their findings.

A comprehensive piece of research was conducted by Nobre-Oliveira[17], who investigated the effect perceptual training had on the discrimination of some English vowels by Brazilian learners. This study focused on six English vowels, being the high back vowels among them. Twenty-nine Brazilian EFL learners received training over a period of three weeks. They were divided into two groups, as one group received instruction based on natural stimuli and the other had synthesized stimuli input. Both experimental groups showed significant improvement in perception tests conducted after training – including both high back vowels - with effects being tested again one month after training. These results corroborate the importance of training for the perception of L2 sounds.

12. Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants" (2004).

13. Brinton and Brinton, *The Linguistic Structure of Modern English* (2010).

14. Yule, *The study of language* (2014).

15. Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants" (2004).

16. Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants" (2004).

17. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007).

A second study that investigated the effects training has on the perception of high back vowels is Wong (2015).[18] The participants were thirty-five Cantonese L1 speakers in Hong Kong, and the material for the test as well as for the training was recorded using the stimuli provided by eight native speakers of American English. The participants had twenty sessions of training, which consisted of a two-alternative-forced-choice identification task that was performed using a computer. The words in the tasks were randomly assigned. Feedback was given to participants during training as well as their score. The analysis of results showed a statistically significant difference indicating a positive effect after training for the vowel identification test. The researcher notes that the high back vowels were poorly discriminated after training when compared to the high front vowels, with the latter having 9,79% more correct answers than the former.

18. Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015). Wong also investigated the effect training had on production for both contrasts, namely high front and high back vowels. The present study, which is focused on perception, reports only the data regarding the results for the perception of the high back vowel contrast.

Considering the results from these two studies that found improvement in teaching the high back vowels – yet, with lower results when compared to the high front vowel seen in Wong[19] - and also the lack of research in general focusing on teaching explicitly the contrast of the English vowels /ʊ, u/ in an EFL context, it seems that more studies focusing on this contrast would contribute to creating a larger body of research in the field.

19. Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

High Back Vowels

The Perceptual Assimilation Model (PAM) predicts that second language phonemic contrasts will be perceptually assimilated to L1 phonemes, as stated by Best and Colantoni *et al.*[20] According to PAM, learners will "discriminate a phonemic contrast based on the way in which each of the members of the contrast is assimilated"[21] (p. 41). PAM was designed to test perception of foreign language contrasts by naïve speakers (i.e., a speaker who has never had contact with the language), and for this reason it is not an ideal model for studies investigating L2 speech learning. For this purpose, PAM-L2,[22] which reinterprets predictions made by PAM in the context of L2 learning, is a better fitting. PAM-L2 makes predictions for L2 patterns when a contrast involves single category, category goodness, or two-category assimilation. PAM-L2 predicts that if an L2 contrast is similar to an L1 contrast, discrimination will be excellent - *two-category* assimilation; differentiation of sound contrasts will be somewhat worse, but still good, if the contrast is perceived as the same L1 category, with one good and one poor exemplar – *category goodness* assimilation, and lastly, the distinction will be much worse if two L2 segments are the same in goodness of fit with respect to an L1 category – *single-category* assimilation. These predictions of PAM-L2 will guide the analysis of the present study.

20. Best, "A direct realistic view of cross-language speech perception" (1995); Colantoni et al., *Second Language speech: theory and practice* (2015).

21. Colantoni et al., *Second Language speech: theory and practice* (2015).

22. Developed by Best and Tyler, "Nonnative and second-language speech perception: Commonalities and complementarities" (2007).

Most L2 studies analyzing vowels tend to consider CLI as a variable, as learners might not have formed L2 categories yet and may associate L2 sounds with L1 categories, which might pose difficulties. Additionally, vowels possess a continuous nature, that is, a speaker can in fact produce a vowel with properties between two or more vowels, according to Colantoni *et al.*,[23] which may pose challenges to L2 listeners.

23. Colantoni et al., *Second Language speech: theory and practice* (2015)

For the studies concerned with vowels, articulatory and acoustic properties are relevant aspects to determine key phonetic characteristics. In regards to the articulators needed for the production of vowels, it is important to note that "the lips, also in conjunction with the tongue position, can be open and closed, as well as rounded (pursed) or unrounded (spread). The rounding of the lips has the double effect of changing the shape of the opening and lengthening the resonating chamber"[24] (p. 37).

24. Brinton and Brinton, *The Linguistic Structure of Modern English* (2010).

Two other features to be considered for the description of vowels are the tense and lax aspects that are encompassed in English. Tenseness, together with length and height, is used to determine the difference of the contrast /ʊ, u/ by native speakers, being /ʊ/ the lax and /u/ the tense back vowel. These aspects are also important for the teaching of pronunciation of vowels, especially minimal pairs.

As mentioned above, the L1 has an impact on L2 perception and this fact needs to be considered for instruction in specific contexts. According to Rauber[25] and Bisol,[26] Brazilian Portuguese (BP) has 12 vowels in stressed position, seven oral and five nasal vowels. Considering the high back vowels, BP does not present the /ʊ/ phoneme, therefore PAM-L2 predicts poor assimilation as BP speakers might perceive both English vowels /ʊ, u/ as a single category linked to the BP vowel /u/.

25. Rauber, "Perception and production of English vowels by Brazilian EFL speakers" (2006).

26. Bisol, "A neutralização das átonas" (2003).

Considering the small number of studies with a sole focus on the contrast of the English vowels /ʊ, uː/, the pieces of research analyzed for this review have shown a broader scope of vowels as well as other sounds, including the examination of production data. However, the results discussed here will concentrate on the perception of high back vowels.

Rauber *et al.*[27] designed a categorical oddity discrimination test to investigate the discrimination of eight English vowel pairs by sixteen Brazilian Portuguese (BP) speakers, who were expected to possess advanced proficiency in the L2. The percentage of accurate answers for the perception of the contrast /ʊ, u/ was 54,33%, which was considered poor. On the other hand, 71% of accurate answers were found for the discrimination of the /ʊ, ʌ/ contrast, considered a moderate difficulty level by the researchers. The result for the last contrast was expected taking into account the difference in F1 and F2 values of these vowels in the target language, as the central vowel /ʌ/ is acoustically more different from

27. Rauber et al., "The interrelation between the perception and production of English vowels by native speakers of Brazilian Portuguese" (2005).

/ʊ/ than /u/. Furthermore, the results partially corroborated one of Rauber *et al.*'s hypothesis in their study, that is, the vowel /ʊ/, which does not exist in BP, would have a low discrimination rate.

Despite evidence from research and classroom experience regarding the difficulty of perceiving vowel contrasts, the L2 classroom still presents limitations when it comes to the teaching of relevant pronunciation components. Silveira has already discussed this issue in her work when she argued the following:

> Unfortunately, most textbooks and pronunciation manuals used to teach English in Brazil ignore the role played by the learner's L1. This is certainly connected with economic factors, for these textbooks and manuals are published to be used in mixed ESL.[28]

28. Silveira, "The influence of pronunciation instruction on the perception and production of English word-final consonants", p. 25 (2004).

Examples of that are some EFL textbooks, widely used not only in Brazil but also in other countries (e.g., the *Interchange* series by Cambridge Press), which are not directed specifically to Brazilian learners of English, since these publishers' materials intend to target learners from various countries.

Method

This section describes the method used to investigate how formal instruction affects Brazilian speakers' perception of the English high back vowels contrast. In order to do so, the participants of the study will be described, followed by the materials, the procedures of data collection and, finally, data analysis.

Participants

The participants were two groups of students of English at the *Extracurricular* course at Federal University of Santa Catarina. The *Extracurricular* courses are the language service courses offered at the university, which are open to the community as a whole, although most students are part of the undergraduate or graduate programs. One group of participants was classified as experimental and the other one as control. Both groups were level 1, which is equivalent to Basic Users (A1 level) in the Common European Framework of Reference for Languages.[29] Two of the authors of this study were teachers of the groups and were in charge of data collection.

29. https://www.coe.int/en/web/common-european-framework-reference-languages

The experimental group consisted of 10 students, 4 males and 6 females. The mean age of the group was 25 years old. Most participants of this group were students (8) pursuing different majors. All participants reported that Portuguese was their first language,

and that they did not speak a second/foreign language. Moreover, they also reported that their contact with English out of the classroom was: up to an hour (1), between 1h and 3h a week (5), between 4h and 5h a week (2), between 5h and 6h a week (1), and no contact (1). They had English classes twice a week, which lasted 90 minutes each. On the day for data collection, the experimental group received specific instruction on high back vowels.

The control group consisted of 7 students, 5 males and 2 females. The mean age of the group was 30,71 years old. Three members of this group were students, and the other four were members from the community. All participants reported that Portuguese was their first language, and one of them also pointed out that he/she speaks Spanish as a second/foreign language at an upper intermediate level. Furthermore, they explained that their contact with English out of the classroom was: up to an hour (1), between 1h and 3h a week (4), and between 4h and 5h a week (2). Their English classes were also twice a week, lasting 90 minutes. On the day of data collection, this group received instruction about a topic not related to high back vowels.

Materials

Prior to data collection, the participants received a consent form[30] in order to authorize the use of the data they would generate. Then, the data were collected with the help of a pretest, the material to provide instruction on English high back vowels, a posttest and two questionnaires.

30. The study protocol was approved by the Federal University of Santa Catarina Ethics Research Board under the register 1.597.582, issued on 16th June 2016.

Questionnaires

The two groups filled out two questionnaires. The first one (Background Questionnaire – see appendix A) aimed to provide necessary information about (a) personal characteristics (name, age, birthplace, occupation); (b) foreign/second language knowledge; and (c) contact with English. The second questionnaire (Self – Report Questionnaire – see appendix B) had the objective to unveil students' perception on the whole experience of data collection. The experimental group considered the tests and the instruction, while the control group reflected on the tests and the lack of instruction.

Pre and posttests

The study included a perception pretest and posttest, which aimed to test whether students perceived the difference between the two English high back vowels. The same test was used to col-

lect pre and posttest data in order to prevent task effect to influence the results.

The perception test contained 57 words, in a mix of 24 target words (12 for each target vowel) and 24 distractors. The target words can be seen in table 1.

Table 1: Target words used in the perception pretest and posttest.

/u/	/ʊ/
Boot	Book
Food	Foot
Suit	Soot
Wooed	Would
Coot	Could
Goop	Good
Luke	Look
Who'd	Hood
Toop	Tood
Poop	Put
Tuke	Took
Coop	Cook

The participants had to hear each word twice, and then identify on the test sheet which word best represented the vowel of the word they had just heard. For each word heard, the participants had three options on the sheet. For example, first, they heard the target word 'foot' twice; then, they had to choose one of the three options available in the test sheet that best represented the vowel, as demonstrated in fig. 1.

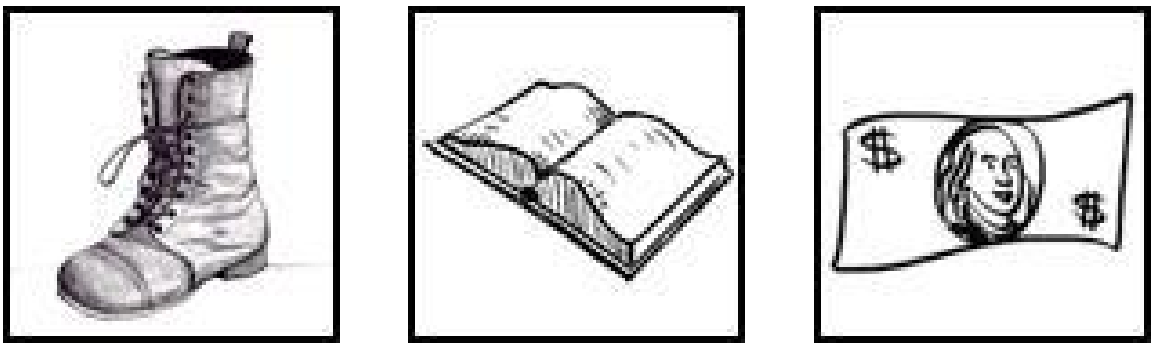

Figure 1: Answer sheet sample.

As the example in fig. 1 shows, each image represents a specific vowel (/u/, /ʊ/ and /ʌ/, respectively). Thus, in this example, the correct response was the image depicting the word 'book', as it contains the same vowel as in 'foot' (/ʊ/).

Besides the target contrast of this study - /ʊ/ and /u/, six other vowels and their correspondent visual representations were used

as distractors: /ɪ/; /i/; /æ/; /e/; /ɒ/ and /ʌ/. These distractors were included with the objective of not giving away the target sounds being tested. The use of images to represent vowels was considered the best option, since the other alternatives, such as phonetic symbols and orthography, could bias participants' perception.

The criteria used to choose the words containing the target vowels were: (a) monosyllabic words which had stop consonants in coda position, (b) preferably minimal pairs. The ideal word should begin with a stop consonant and end with a voiceless stop consonant, considering that voiced consonants in coda might alter the sound quality of the vowels. However, the target contrast does not provide enough minimal pairs with this pattern (stop consonant plus vowel plus voiceless stop consonant). Consequently, an effort was made to include monosyllabic words that contained a stop in the coda position, but still we had to create pseudo words to fulfill the established criteria and have minimal pairs, in stimuli such as 'tuke', 'took' and 'tuk'.

All target words and distractors were recorded by two English native speakers (one male and one female), who read them in individual sessions. The rationale for having two speakers in this study is that it may offer variety to the listeners; therefore, in the perception test, a token recorded by the male talker was followed by a token recorded by the female talker. The words were recorded on the software TP-Worken.[31] The speakers wore a headset and recorded the words in a quiet room. Each speaker received a sheet with two different tables, with three columns each. The first table included words with the high back vowels (first and second columns) and one of the distractor vowels, the mid-central vowel (third column). The second table contained the words with the other distractors, which were distributed randomly in the chart. The speakers were asked to read the words, one by one, loud and clear, without making long pauses. The speakers were instructed to produce the vowels in standard form. In the case of the pseudowords, the speakers were instructed to produce the vowels as predefined by the researchers.

31. Rauber et al., *TP – Testes de Percepção / Tarefas de Treinamento Perceptual* (2012).

After the recording sessions, the target words were used to design the Perception Test. In relation to the tokens used for this test, half of them were recorded by the male speaker, while the other half was recorded by the female speaker. In the perception test, the tokens produced by each speaker were interspersed. A single audio file was created with the help of the *Ocenaudio* program,[32] adopting the following pattern: each word was recorded twice, with a 2-second pause between the repetition, and a 4-second pause before the next word. The words included in the perception test (in order) can be seen in table 2.

32. https://www.ocenaudio.com/

1. food	13. vet	25. could	37. heat	49. tood
2. seed	14. sut	26. cut	38. look	50. coop
3. hat	15. would	27. good	39. hood	51. put
4. suit	16. beet	28. bat	40. pup	52. tuff
5. foot	17. vet	29. god	41. cook	53. rock
6. vet	18. pat	30. tink	42. vet	54. heat
7. cock	19. fup	31. sink	43. luck	55. back
8. cup	20. sut	32. gut	44. toop	56. tuk
9. seed	21. wud	33. luke	45. hut	57. think
10. wooed	22. heat	34. pack	46. poop	
11. tuk	23. bag	35. god	47. bag	
12. coot	24. goop	36. pot	48. fat	

Table 2: Words included in the perception test. Only the distractors repeat (with the exception of the mid central vowel). The high back vowels never repeat.

Pronunciation Instruction

The pronunciation instruction, provided to the experimental group, was mostly based on Zimmer, Silveira and Alves's[33] book, which deals specifically with pronunciation instruction to Brazilian learners of English. The book has a specific unit working with vowel assimilation, and, within this unit, a subsection dedicated to /u/, /ʊ/ and /ʌ/. The instruction was given in Portuguese, in order to guarantee that students could understand what the teacher was talking about, since we expected they were not familiar with pronunciation teaching terminology. Due to time constraints, only some of the activities from the book were chosen to be part of the instruction (activities 1, 1.1, 2, 4, 5, and 5.1 – pages 98, 99, and 100). These choices were made bearing in mind the creation of three main moments: (1) exposure to the target vowels contrast; (2) explicit explanation of their differences (sound, articulation, phonetic symbol); and (3) practice on the pronunciation and discrimination of the two vowels. The period of instruction lasted 30 minutes, and more information about the instruction is provided in the following section and in appendix C.

33. Zimmer et al., *Pronunciation Instruction for Brazilians* (2009).

Procedures

The data collection procedures were carried out separately for the experimental and the control groups, and took one class (1h30min) for each of them. The steps are displayed in table 3.

Table 3: Steps to collect data from the experimental and control groups

Experimental Group	Control Group
1- Consent Form reading and signing	1- Consent Form reading and signing
2- Background Questionnaire	2- Background Questionnaire
3- Familiarization test	3- Familiarization test
4- Pretest	4- Pretest
5- Instruction	5- Unrelated activity
6- Posttest	6- Posttest
7- Self-report Questionnaire	7- Self-report Questionnaire

During the class prior to data collection, the teachers of each group distributed and explained the consent form. Once students had accepted and signed this form, they were able to participate in the study.

The class dedicated to the data collection took place in a Language Lab at the university (UFSC). The Lab has a sound system with 32 headphones controlled by a computer. In this study, each participant sat at a desk and each of them had access to a headphone. As the desks and the headphones were all standard in that lab, all participants were therefore under similar conditions.

Data collection started with students filling in the Background Questionnaire. After that, the researchers explained the instructions; more specifically, they explained that participants would hear several words, and their task was to mark on the test sheet which word best represented the vowel of the word they had just heard. The researchers gave two examples similar to the test - but not using words with the target contrast - and checked the participants' answers to make sure they had understood the task. After that, the participants took a familiarization test to feel more comfortable with the situation and get used to the test. This test contained 8 sets of stimuli and was very similar to the real test; however, while the official test had only images, the familiarization one started with images and its orthographic representations to gradually change to images only. The researchers explained that those data would not be considered in the study.

As soon as the participants were acquainted with the test, they began the perception pretest. It lasted 8 minutes and 57 seconds. Subsequently, the researchers gave a 30-minute instruction about the high back vowels to the experimental group. The control group, on the other hand, had a 30-minute instruction about the pronunciation of the past tense of regular verbs, a topic that was not directly related to the pronunciation of high back vow-

els. Finally, after the instruction period, the participants took the posttest, which again lasted 8 minutes and 57 seconds. The participants were asked to fill in the self-report questionnaire as the last activity of the class.

Data Analysis

First, participants' scores on the pre and posttests were tallied. The following categories were created: (1) number of right answers for the target vowels; (2) number of right answers related to /u/; and (3) number of right answers related to /ʊ/. The numbers were transformed into percentages to have a better overview. Comparisons between the control and experimental groups were made, as well as comparisons within each group. A preliminary inspection of the data showed that they did not present normal distribution, which was expected given the small sample size. For this reason, all statistical analyses relied on nonparametric tests. More specifically, the between-group comparisons were conducted with Mann-Whitney tests, while the within-group analyses relied on Wilcoxon tests.

Second, the self-report questionnaire helped to unveil participants' thoughts on the test and the type of instruction they received. Their answers were also compared to their scores as a manner to understand whether their judgment was somehow related to their performance.

Results and Discussion

The main objective of this research was to examine the role of instruction in the perception of the high back vowel contrast by Brazilian learners of English. With that in mind, the results will be presented from both quantitative and qualitative perspectives. Considering the quantitative perspective, the results related to the pretest and posttest were summarized in tables and submitted to statistical analyses. Regarding the qualitative perspective, the participants' perceptions on the role of pronunciation instruction will be brought to the discussion as they play an important part in the process, considering either its presence or absence.

Results

In this section, first we describe the quantitative results by comparing the perception test scores across groups and then within each group. By conducting these comparisons, we intend to answer the central research question of this study, namely, whether

a limited amount of formal pronunciation instruction plays a role in the perception of English high back vowels by Brazilian learners.

Table 4 displays the results of the perception pretest and posttests for both the experimental and the control groups. Considering the individual results for the experimental group, the data analyzed indicate that out of the 10 participants, four of them showed improvement in the posttest scores regarding the target vowel contrast. Four participants demonstrated a decrease in their performance in the posttest and two participants did not present any change in their performance. The difference for the participants who showed improvement ranged from 4.17% to 20.83% (see table 4). On the other hand, the differences in the decreases ranged from 4.17% to 16.67%.

Table 4: Experimental and control group's pre and posttest total results. Maximum score possible: 24.

	Total pretest	Total posttest	Gain score
Experimental Group			
P2	14 (58.33%)	16 (66.66%)	+8.33%
P6	8 (33.33%)	10 (41.66%)	8.33%
P3	7 (29.16%)	12 (50%)	+20.84%
P8	7 (29.16%)	8 (33.33%)	4.17%
P7	9 (37.50%)	9 (37.50%)	0%
P10	7 (29.16%)	7 (29.16%)	0%
P1	12 (50%)	11 (45.83%)	-4.17%
P9	12 (50%)	8 (33.33%)	-16.67%
P4	8 (33.33%)	5 (20.83%)	-12.50%
P5	8 (33.33%)	7 (29.16%)	-4.17%
Control Group			
PC1	9 (37.50%)	10 (41.66%)	+4.16%
PC6	6 (25%)	7 (29.16%)	+4.16%
PC2	10 (41.66%)	8 (33.33%)	-8.33%
PC3	9 (37.50%)	8 (33.33%)	-4.17%
PC4	11 (45.83%)	6 (25%)	-20.83%
PC5	11 (45.83%)	7 (29.16%)	-16.67%

Concerning the control group, out of 6 participants, two showed improvement in the posttest in relation to the pretest, and the other four presented a decline in their posttest results. The gains' differences were 4.16% (see table 4) and the decrease differences ranged from -4.17% to 20.83%. Thus, the numbers related to declines are larger than the numbers referring to gains. Therefore, these results may suggest that there is an influence of other variables, for instance, participants who improved might have either learned with the test itself, or their proficiency might have played a role there.

Table 5 displays the descriptive statistics (mean, standard devia-

tion, and range) for the two groups in the pretest and the posttest. These figures show a similar performance for the two groups in the pretest, but, in the posttest, the experimental group obtained higher means. Furthermore, the experimental group had considerable variance in their performance, which is demonstrated both by the wide score range and high standard deviations, both in the pretest and the posttest.

	Pretest mean (sd)	Posttest score range	Mean (sd)	Score range
Experimental Group (n=10)	9.20 (2.53)	7-14	9.30 (3.12)	5-16
Control Group (n=6)	9.33 (1.86)	6-11	7.67 (1.36)	6-10

Table 5: Descriptive statistics for the perception pretest and posttests for the experimental and the control groups.

To examine whether the performance of the two groups was significantly different, we compared the scores of the two groups with Mann-Whitney tests. The pretest comparisons showed that in the pretest, the two groups performed similarly, given that the slight difference between the means for the two groups was found to be non-significant (pretest p= .713), which indicates that the two groups come from a similar population. A similar comparison was conducted with the posttest data to check whether the two groups differed in their perception of the high back vowels after the experimental group received relevant pronunciation instruction. Again, the posttest difference was not statistically significant (p=.263), despite the considerable mean difference that we can observe across the two groups (Experimental group mean: 9.30; Control Group: 7.67).

Table 5 also shows that the experimental group presented a slight increase in their posttest mean (9.30) in comparison to the pretest results (9.20), contrary to the control group, which actually obtained a lower mean in the posttest (7.67) than in the pretest (9.30). To observe whether each group changed from the pretest to the posttest, we performed a within-group comparison by running Wilcoxon related-sample tests. The results showed no significant difference within each group (experimental group, p = .168; control group, p = .888). Thus, despite the clear difference between the two groups, the larger variance in the experimental group and the small sample size may have prevented us from finding significant differences within and between groups.

Therefore, these results do not go hand in hand with results from a previous study[34] that presented significant results for the perception of the high back vowels after training sessions. However, the results of the present study bear a strong resemblance with those obtained in Wong's,[35] in which this researcher investigated the effects of training in the perception of the high back vowels. Contrary to Nobre-Oliveira's study, Wong's did not have statistically significant results for the perception of the high back vowels.

34. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007).

35. Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

As a final step in the quantitative analysis, we observed the means obtained for each group, in each test, for the two target vowels. As table 6 shows, both groups obtained higher correct identification scores with the tense vowel than with the lax vowel, and the posttests means for the tense vowel decreased in the posttest for the two groups, thus indicating a decline in performance in the posttest. However, for the lax vowel, the experimental group improved across tests, while the control group obtained lower means in the posttest.

To check whether these differences were significant within each group, Wilcoxon tests for related samples were run. The only result that came out significant was the comparison between the perception of the lax (4.00) and the tense vowel (5.20) in the pretest for the experimental group ($p = .04$). Between-group comparisons were also run with Mann-Whitney tests, but no result came out significant.

	Tense vowel Pretest	**Tense vowel Posttest**	**Lax vowel Pretest**	**Lax vowel Posttest**
Experimental group	5.20 (1.75) Range: 3-8	4.90 (2.42) Range: 1-10	4.00 (1.33) Range: 2-6	4.40 (1.34) Range: 3-7
Control Group	4.85 (1.77) Range: 3-7	4.42 (1.39) Range: 3-7	4.28 (1.25) Range: 2-6	3.71 (1.25) Range: 3-6

Table 6: Descriptive statistics (mean, standard deviation and range) for each target vowel.

In conclusion, the two groups presented similar scores for the two high back vowels, with a tendency for performance to decrease in the posttest. There was a tendency for the tense vowel to be easier to perceive than the lax vowel, and this tendency was more prominent in the performance of the experimental group in the pretest. Based on these results, no conclusion can be drawn as to which of the high back vowels poses more difficulties to Brazilian learners of English at the perception level. Furthermore, a short period of pronunciation instruction did not seem to help the experimental group to improve their performance in the posttest.

Discussion

Among the reasons that might explain these results, we suggest the following: 1) half an hour of instruction may not be enough for a change in the perception of the high back vowel contrasts by level 1 Brazilian learners of English; 2) there is the possibility that participants learned with the test; 3) the data collection session took too long and the participants might have gotten tired and overloaded their attentional resources. As a result, they might have simply tried to guess the answers; 4) Even after receiving instruction, the experimental group might have continued not being able to perceive the differences between the high back vowels con-

trast, as there is the possibility that they assimilated this contrast as a single category; and 5) The presence of the mid central vowel /ʌ/ in words used as distractors might have confused the participants, as this is a sound which is sometimes confused with the lax high back vowel by Brazilian speakers of Portuguese, who may perceive/produce the vowel in words such as 'put' [pʰʊt] as /ʌ/.

Regarding the first possible aforementioned reason for the results, one may argue that half an hour of instruction is insufficient for making learners aware of subtle vowel contrasts; instead, continuous pronunciation teaching in the language classroom should be the goal. Previous studies that investigated the role of perception training activities (i.e., activities that make learners listen to sound contrasts and identify and/or discriminate them) have presented mixed results. For instance, in her doctoral dissertation, Nobre-Oliveira[36] provided longer periods of perception training for a number of vowel contrasts, including the English high back vowels. The training period was distributed along three weeks and included 90-minutes of in-class training accompanied by take-home activities using an audio CD with two activities for each of the three weeks. In Nobre-Oliveira's study, the high-back vowel contrast was found to be extremely difficult for Brazilian learners in the pretest. The participants in Nobre-Oliveira's study managed to significantly improve performance after receiving perception training, but the contrast between high-back vowels still yielded high misidentification scores in the posttest. Therefore, Nobre-Oliveira concluded that training seems to play a role in the perception of the vowel contrasts, especially for the high back vowels, since her participants obtained the best results in the posttest regarding this contrast. However, Wong,[37] who in her study had twenty sessions of training for the participants for both high front and back vowels, did not find statistically significant gains for high back vowels.

36. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007).

37. Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

In relation to the second reason why no positive effect of pronunciation instruction was found in the present, one possible explanation is that the participants from the control and experimental groups that have showed improvement in the posttest might have learned with the pretest itself. Furthermore, the third reason regarding the fact that in both groups some participants had a negative performance might be that the participants became tired as a result of the long period of data collection which exceeded an hour. In this case, the participants' attentional resources might have been compromised by the data collection process as a whole.

Moreover, concerning the fourth reason, it is possible to explain the results of this study by using the PAM-L2 precepts, since it makes predictions related to the difficulty learners may have regarding the target language (TL) contrasts. This model may provide some insights on the results of this piece of research as it has

been used to account for L2 speech perception. For instance, according to PAM-L2, there is the possibility, among others, that a listener assimilates a "phonemic contrast" as a "single-category" (single-category assimilation - SC), that is, this listener would assimilate both phonemes of the contrast, in the case of this study, the high back vowels, as a single category. Thus, drawing a connection between the PAML2 and this study, considering that our participants are Brazilians (speakers of Brazilian Portuguese as an L1), and that they only have one vowel that sounds quite similar to the English tense and lax high back vowels, one may say that this contrast would be perceived as the same vowel. In other words, native speakers of BP, naïve listeners or maybe beginner learners of English, as suggested by the results of this research, might assimilate the vowel contrast as a single-category. We did not include a goodness of fit scale in the test design, thus at this point we cannot discuss whether one of the two high back vowels was regarded as a better exemplar of the target vowel than the other by the participants.

Concerning the fifth reason that could account for the results, it is possible to say that the presence of words containing the mid central vowel /ʌ/ might have affected the results of this study. To illustrate that, Nobre-Oliveira's[38] study results suggested that /ʊ/ may be perceived by Brazilian learners (and even by some native speakers) as /ʌ/, since in her study participants had difficulties with these vowels. In fact, in the present study, among the misidentifications made by the experimental group, both in the pre and posttest, in which the target vowels were misidentified as the mid central vowel /ʌ/, there was an average of these misidentifications that ranged from 8.1 in the pretest to 7.1 for the experimental group in the posttest, and 10.4 in the pretest and 9.3 in the posttest for the control group. Thus, considering that the high back vowels were misidentified at least 7.1 times as the mid central vowel, in average, it is possible to say that the mid central vowel /ʌ/ seems to play a role in the perception of the high back vowels by Brazilian learners of English.

38. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007).

Qualitative Perspective

To complement the analysis, we should approach the results from a qualitative perspective by bringing the participants' voices, considering their answers in the self-report questionnaires.

The experimental group's self-report questionnaires revealed that all participants found the pronunciation instruction helpful (see table 7). For example, one participant wrote a comment in the questionnaire in which she seems to regard the experience as positive: "*Achei um teste muito promissor, (...) fazendo, nós do 1º nível, entender coisas além do que é ensinado em curso, e que geral-*

mente se aprende na prática somente".[39] Although she addresses the whole process with the expression "a test", by reading her entire remark, we can speculate that she means the data collection session or "class" as a whole. Thus, it indicates that she is pointing to the fact that pronunciation instruction, or perhaps, the specific contents, which were approached during the data collection, are not part of her regular classes. Note, however, that this participant's comment also indicates a certain view about L2 phonetic/phonological learning, which she regards as a component that is generally learned by using the target language. The same comment also reviews a reality in most language classrooms that are guided by the Communicative Approach to L2 teaching – a lack of focus on pronunciation teaching.[40]

39. "I think the test is very promising, (...) making us, 1st level students, understand things that go beyond the course curriculum and that one often learns by practicing."

40. Silveira, *The influence of pronunciation instruction on the perception and production of English word-final consonants* (2016).

Participant	How much did the instruction help?
P10	6
P3	6
P5	6
P2	6
P6	6
P4	5
P8	5
P7	6
P1	6
P9	4
Average	**5.6**

Table 7: Participants' evaluation on the helpfulness of the pronunciation instruction provided to the experimental group. Likert scale from 1 to 6.

In relation to the control group, they were asked if they had received the teacher's formal instruction on the differences between the targeted contrast, it would have helped them in their performance in the test. Their responses were unanimous in favor of the importance of receiving formal instruction. In addition, a participant pointed out that formal instruction, such as the one provided, helped to better comprehend the language:*"Importante aula de fonética para melhorar no entendimento da língua"*.[41] It is reminded that the control group also had formal pronunciation instruction that focused on a non-related contrast to this study, the pronunciation of regular verbs in the past tense. For more information about the Self-report questionnaire answers, see Appendix D.

41. "An important phonetics class to improve language comprehension."

To sum up, as previously mentioned, quantitatively, the findings did not quite correspond to the expectations, as the experimental group's results in the posttest showed a quite small improvement, therefore not significant, in relation to the pretest. Although it is possible to see some improvement, they do not seem to be sufficient to corroborate the hypothesis raised by these researchers. Contrastingly, from a qualitative perspective, all the participants in the experimental group regarded the pronunci-

ation instruction they received as helpful. Similarly, the control group unanimously agreed that targeted formal instruction would have contributed to their performances in the test.

Conclusion

Throughout the history of pronunciation teaching, the field of second language learning has experienced different moments, which included a period of time when pronunciation was an important issue in the 1940s and 1950s, to a moment in which there was the necessity of reconsidering the adequacy of pronunciation teaching methodology and goals in the 1980s.[42] However, the field has received a considerable amount of research, and although empirical research has showed mixed results, as previously mentioned, this might have just served as an invitation for more studies, since there is still a gap to be filled, as there are some phenomena that have not been investigated yet.

42. Celce-Murcia et al., *Teaching pronunciation: a reference for teachers of English to speakers of other languages* (1996).

Taking the aforementioned into consideration, this study is an attempt to contribute to the field. Thus, the objective of this piece of research was to investigate whether instruction would affect the perception of the high back vowel contrast by Brazilian learners of English. To accomplish that goal, two groups of beginners, learners of English at the *Extracurricular* courses, were invited to participate in this study, an experimental and a control group. These researchers' expectations were that the experimental group would overcome the control group in the posttest, because of pronunciation instruction. However, the results revealed that both groups obtained similar results. Among the possible reasons why one had this outcome, five were enumerated by these researchers. First, thirty minutes of instruction might not be enough to show immediate improvement. Second, the improvement that both groups showed might have been the result of learning with the pretest itself. Third, the duration of the data collection procedures was too long and it might have tired the participants. Fourth, as predicted by the PAM-L2, the participants could not perceive the difference because they assimilate the target contrast into a single category, even after receiving instruction. Fifth, the mid central vowel /ʌ/ might have interfered with the results, as it may be sometimes confused with the high back vowels. Finally, it is important to point out that the present study has a small sample size and this fact may have masked the seemingly positive effect of pronunciation instruction observed for the experimental group.

On the other hand, a qualitative analysis revealed that all participants in the experimental group found the pronunciation instruction helpful. In addition, the control group unanimously pointed out that pronunciation instruction might have helped

them in the posttest. In sum, the aforementioned findings seem to agree entirely or in part with other similar studies' results, for instance, Nobre-Oliveira's and Wong's studies.[43]

As teachers, these researchers have faced some moments in which they themselves realized that pronunciation teaching seems to be necessary in many moments in the classroom. Thus, considering the results of this piece of study, one may say that replicating studies such as this one, with different groups and perhaps in different environments, seems to be necessary for a better understanding of the perception of vowel contrasts. We also believe that a better understanding of the phenomena involved in teaching pronunciation is crucial for teachers to help students in the classroom environment, considering that not holding this knowledge might compromise the learning processes. Thus, in order to avoid that, it is our belief that pronunciation teaching is a promising field that is worth exploring as a way to better understand our own practices as teachers.

43. Nobre-Oliveira, "The effect of perceptual training on the learning of English vowels by Brazilian Portuguese speakers" (2007); Wong, "Comparing the perceptual training effects on the perception and production of English high-front and high-back vowel contrasts by Cantonese ESL learners" (2015).

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Appendices

Background Questionnaire

Questionário de Perfil dos Participantes
Universidade Federal XXXXXXXX

Centro de Comunicação e Expressão - DLLE

Nome: _____
Idade: _____ Sexo: _____
Língua materna:_____
Cidade de origem:_____
Ocupação (se for estudante, favor, especificar o curso de graduação ou pós-graduação:_____

Por favor, responda as seguintes perguntas.

Você fala outra língua? Inglês não conta.
( ) Não ( ) Sim. Qual língua? _____
Numa escala de 1 a 6, sendo 1 iniciante e 6 avançado, qual seu nível nessa terceira língua. Faça um X na sua escolha.
(1) (2) (3) (4) (5) (6)

Qual seu contato com a língua inglesa fora da sala de aula (homework não conta)?
( ) – Nenhum contato extra
( ) – até 1 hora por semana
( ) – de 1h a 3h por semana
( ) – de 4h a 5h por semana
( ) – de 5 a 6 h por semana
( ) – mais de 6 horas por semana

MUITO OBRIGADO! ☺

Self-report Questionnaire

Experimental Group:

Self-Report Questionnaire
Universidade Federal de XXXXXXX

Centro de Comunicação e Expressão - DLLE

Nome: _____
Por favor responda as seguintes perguntas.

1 -Você acha que o teste de familiarização, no início, e as instruções de como fazer o teste facilitaram sua execução?
( ) Sim ( ) Não.

2 – Algum teste foi mais fácil? Antes ou após a instrução do professor?
( ) Antes ( ) Depois ( ) Os dois foram fáceis ( ) Os dois foram difíceis

3 – Com relação à instrução dada pelo professor, numa escala de 1 a 6, sendo 1 – não me ajudou e 6 – me ajudou muito. Como você classificaria a instrução dada.
Faça um X na sua escolha.
(1) (2) (3) (4) (5) (6)

4 - Você gostaria de fazer algum comentário com relação ao teste
_____
_____
_____

MUITO OBRIGADO! ☺

Control Group:

Self-Report Questionnaire

Universidade Federal de XXXXXXX

Centro de Comunicação e Expressão - DLLE

Nome: _____
Por favor responda as seguintes perguntas.

1 -Você acha que o teste de familiarização, no início, e as instruções de como fazer o teste facilitaram sua execução?
( ) Sim ( ) Não.

2 – Algum teste foi mais fácil? O primeiro ou o segundo?
( ) Primeiro ( ) Segundo ( ) Os dois foram fáceis ( ) Os dois foram difíceis

3 – Você acha que se tivesse havido instrução formal do professor mostrando a diferença entre os sons do teste isso teria ajudado na execução do teste.
( ) Sim ( ) Não.

4 - Você gostaria de fazer algum comentário com relação ao teste
_____
_____
_____

MUITO OBRIGADO! ☺

Class plan – Instruction

XXXXXX – XXXXXX
Produção e Percepção da Fala em L2 – ProfessorXXXXX
MA Students: XXXXX, XXXXXX e XXXXX

Teaching Plan – Pronunciation Instruction

This class plan will be used as the set of instructions for the treatment session which will be delivered to the participants of a study from the area of "*Características da Fonologia e suas Implicações para a Inteligibilidade e o Ensino de Línguas*" that will be conducted in the language lab at Centro de Comunicação e Expressão at XXXXX. The activities used for the instruction were extracted from the book entitled *Pronunciation Instruction for Brazilians: Student's Book* by XXXXX, Márcia Zimmer, and Ubiratã Kickhöfel Alves (p. 98-99). The procedures will be applied in the following order, the participants will do a pretest and in the sequence, they will do the activities present in this plan.

After students do the pretest, the researcher/teacher will tell the students/participants that they will do some activities. The teacher will give the first activity's instructions without mentioning about the vowels contrast. The explanation will be delivered in Portuguese in order to guarantee that students understand what the teacher is talking about, since it is a more technical subject and the intentions of the study being conducted have to be taken into account **(ie. Pessoal, agora vocês vão fazer uma atividade).** Then, the researcher will distribute the activity sheets and confirm if they all have the sheet **(ie. Todos tem a folha da atividade?)**. After that, the researcher will explain the activity **(ie. Escutem as palavras presentes nas colunas A e B com atenção).** Play **audio 43.**

Listening

1. Listen to the words in columns A and B and pay attention to the pronunciation of the vowels.

A		B	
pool	school	put	would
food	new	book	full
group	glue	good	push
do	juice	sure	pull

After students listen to all of the words, the teacher/researcher will explain that there are two different high back vowels in English **(ie. Pessoal, em inglês a vogal "u" possui dois sons diferentes).** The researcher will write on the board the two vowels using the alphabet transcription – International Phonetic Alphabet (IPA) – /u/ and /ʊ/ **(ie. Pessoal, essas vogais são transcritas* da seguinte maneira (escrever no quadro "/u/ and /ʊ/"). Dependendo da palavra, ela pode ser pronunciada com a boca mais fechada e mais arredondada (tense) e possui maior duração, ou menos arredondada, boca mais aberta (lax) e possui menor duração).** The teacher will then use the images of the test (the ones the participants have to relate to sounds of the vowels they hear with) as examples. Furthermore, the researcher will open the website "soundsofspeach.uiowa.edu[1]" and show the students the mouth and tongue move while producing the high back vowels.

After explaining the high back vowels contrast, the teacher will ask them to do the next activity **(ie. Pessoal, agora que vocês sabem sobre essa distinção, vamos praticar um pouquinho. Vamos fazer a atividade 1.1. Nessa atividade, vocês escutarão novamente as palavras da atividade 1 no quadro. Dessa vez, vocês vão escutar e em seguida as pronunciarão baseado no que vocês escutarem. Vocês entenderam o que vocês precisam fazer?).** The researcher will

[1] Retrieved from http://soundsofspeech.uiowa.edu/english/english.html.

then play the audio program and pause after each word in order to give students time to repeat after the audio **(audio 44).**

Listening

1.1 Listen to the words in (1) and practice pronouncing them.

After students finish the aforementioned activity, the researcher will then introduce the next activity **(ie. Pessoal, agora vamos fazer a atividade 2. Nessa atividade, vocês ouvirão algumas palavras e, para cada palavra, vocês terão que marcar qual é a vogal pronunciada em cada uma delas).** **Audio 45.**

Listening

2. Listen and circle the correct sound of the pronounced words.

a) [ʊ] [u]	d) [ʊ] [u]	g) [ʊ] [u]
b) [ʊ] [u]	e) [ʊ] [u]	h) [ʊ] [u]
c) [ʊ] [u]	f) [ʊ] [u]	i) [ʊ] [u]

For the next activity, students will listen to three words in which there will be two words with the vowel /ʊ/ and one word with a different sound. After listening to the words, students will check the word with the different vowel sound **(ie. Pessoal, agora vocês irão escutar três palavras em cada alternativa e vão marcar a opção referente à palavra que tem um som diferente de /ʊ/. Vamos conferir o exemplo).** After using the exmaple to model the activity, the researcher will check if they understand the activity **(ie. Do you understand the activity, guys?)** and then play the **audio 46.**

4. Listen to sets of three words. Two of them will have the [ʊ] vowel and one will have a different vowel. Circle the word that has a different vowel.

Example:

You hear the words (a) could, (b) cold, (c) should. You circle (b) because the word "cold" has a different vowel sound.

1.	a	b	c	6.	a	b	c
2.	a	b	c	7.	a	b	c
3.	a	b	c	8.	a	b	c
4.	a	b	c	9.	a	b	c
5.	a	b	c	10.	a	b	c

Following the sequence, the teacher will move on to the next activity, which is number 5.1. In this activity, students will have to listen to some words and insert them into a chart according to their correct vowel sound (ie. Ok, pessoal, agora vocês escutarão algumas palavras que possuem os diferentes sons de "u" em inglês. Assim que vocês escutarem as palavras do áudio, vocês as organizarão no quadro acima dentro da categoria que elas pertencem, de acordo com as suas percepções. Vocês entenderam?). If the students say they do not understand, go over the first word in the audio and model the activity with them. **Audio 47.**

5. The sounds of "u":
By now you probably noticed that the letter "u" may be pronounced in different ways, as demonstrated by the examples below:

[ʊ]	[u]	[ʌ]*
put *full*	*glue* *June*	*cut* *jump*

*The phoneme /ʌ/ is similar to the schwa /ə/, which we practiced in unit 7.4, but /ʌ/ occurs in stressed syllables.

 Listening

5.1 Listen to the words below and add them to the table above, according to the pronunciation of the letter "u".

sugar	hut	boot	sun	bus	study
super	good	rude	bull	null	student

As the activity presented above is the last one of the set, the researcher/teacher will then compliment students **(ie. Muito bem, pessoal!),** and tell them that the researcher, Carlla, will assume the next part of the class, which will be the posttest **(ie. Ok, agora a Carlla vai assumir novamente e vai dar instruções para vocês do que será feito a seguir).** With this, the treatment session will end.

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Self-report questionnaire answers

Self-Report Questionnaire (Control Group)	
Were the familiarization test and the instructions about the test helpful?	7 – Yes 0 – No
How easy were the tests?	2 – The first test was easier 1 – The second test was easier 2 – Both tests were difficult 2 – Both tests were easy
Do you think it would have been easier to do the test if you had had instruction on the contrast present in the test?	7 – Yes 0 – No

Self-Report Questionnaire (Experimental Group)	
Were the familiarization test and the instructions about the test helpful?	10 – Yes 0 – No
How easy were the tests?	0 – The first test was easier 7 – The second test was easier 3 – Both tests were difficult 0 – Both tests were easy
In a scale, how helpful was the instruction provided? 1 – not helpful and 6 very helpful.	0 – 1 0 – 2 0 – 3 1 – 4 3 – 5 6 – 6

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