

## PRONUNCIATION INSTRUCTION AND SYLLABIC-PATTERN DISCRIMINATION\*

(Ensino de pronúncia e a discriminação de padrões silábicos)

Rosane SILVEIRA

(Professora Adjunta do Departamento de Língua e  
Literatura Estrangeiras - UFSC)

**Abstract:** *The present research is an investigation of the role played by pronunciation instruction in the discrimination of English CVC and CVCV syllabic patterns in word-final position. The participants of this study were two groups of Brazilian learners (beginners): the control group (10 students), and the experimental group (12 students). Both groups were given a discrimination pretest and posttest, between which the experimental group received instruction based on a pronunciation manual with activities focused on the English syllable and word-final consonants, whereas the control group received no such instruction. The pre and posttests consisted of an oddity discrimination test, in which the participants had to discriminate between the CVC and CVCV syllabic patterns. The posttest results showed somewhat greater improvement for the experimental group than for the control group, but this difference was not statistically significant.*

**Key-words:** *pronunciation; formal instruction; epenthesis; syllabic patterns.*

**Resumo:** *O presente estudo testou o efeito do ensino da pronúncia na percepção do contraste entre os padrões silábicos CV e CVC no final de palavras da língua inglesa. A pesquisa contou com a participação de um Grupo Experimental e um Grupo de Controle. Apenas o Grupo Experimental recebeu instrução sobre a pronúncia de algumas consoantes finais do inglês e sobre a importância de evitar o uso de uma vogal epentética para pronunciar estas consoantes. Os dois grupos foram testados (pré-teste) antes que o primeiro grupo recebesse o tratamento (i.e., instrução relacionada à pronúncia das consoantes finais), bem como uma semana após o tratamento (pós-teste). Os resultados do pós-teste sugerem que o Grupo Experimental apresentou um desempenho superior ao do Grupo de Controle (ainda que*

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*essa diferença não tenha sido estatisticamente significativa), especialmente com relação às consoantes praticadas com o auxílio da apostila de pronúncia.*

**Palavras-chave:** *pronúncia; instrução formal; epêntese; padrões silábicos.*

## 1. INTRODUCTION

Most studies on the effects of pronunciation instruction have either concentrated on specific methods and techniques or a comparison among them (Elliot, 1995; Jamieson & Morosan, 1986; Macdonald, Yule & Powers, 1994; Matthews, 1997; Neufeld, 1977; Quijada, 1997; Strange & Dittman 1984); or they have investigated secondary topics such as the delayed effects of pronunciation instruction (Yule, Hoffman & Damico, 1987; Macdonald et al., 1994). This research has thus been linked principally to the area of methodology, but has not provided a conclusive answer concerning the role played by instruction in the development of pronunciation proficiency. While some studies indicate that instruction is ineffective (e.g., Macdonald et al.; Quijada), others suggest the opposite (e.g., Elliot; Matthews). It is difficult to compare the various studies because of their different objectives and the variety of research designs. Also, some have dealt with pronunciation in general with subjective evaluations (Elliot; Macdonald et al.; Neufeld; Yule et al.), and others with particular aspects of pronunciation. When the focus was on specific pronunciation items, these items were always similar but contrasting segments (e.g., Strange & Dittman, 1984 – the English /r/-/l/ contrast; Jamieson & Morosan, 1986 – the /ð/-/θ/ contrast; Matthews – six contrasts). None of the studies mentioned here focused on the syllable.

In addition to the lack of conclusive answers concerning the role of instruction, there is also, as pointed out by Baptista (2000a), a lack of a theory-research-practice interface in the literature. That is, pronunciation teaching practice and instructional research, while sometimes backed up by second language acquisition (SLA) theory or phonetic and phonological description, has rarely had a firm enough basis in interphonology research findings. In a survey of eleven books on the teaching of L2 pronunciation published between 1986 and 1997, Baptista found that eight of them included not a single reference to the interphonology literature in the bibliography and two included only three and four references. Only one – Celce-Murcia, Brinton, and Goodwin (1996) – included a large number

of references on interphonology, but connections were not clearly made between the interphonology literature and specific teaching suggestions.

The present research aims at contributing to the construction of the theory-research practice interface, by investigating the effect of instruction on the perception of an English syllable structure shown by several interphonology studies to be difficult for learners whose L1 does not permit it – the CVC pattern. Syllable structure is one of the areas where the theory-research-practice interface is lacking. Although the syllable is widely discussed in recent theoretical phonology literature and has been a frequent item of investigation in interphonology research, it generally does not appear in pronunciation manuals or in publications on the teaching of pronunciation. Celce-Murcia et al. (1996) is also one of the few publications on the teaching of pronunciation to deal specifically with consonants in final position, but even this book does not deal with the syllable as such.

## 2. THE SYLLABLE: THEORY, RESEARCH, AND PRACTICE

Interphonology research on the syllable has focused on consonant clusters (e.g., Abrahamsson, 1997; Broselow, 1987; Carlisle, 1991; Cornelian Júnior, 2003; Eckman, 1991; Major, 1994; Rauber, 2002; Rebello, 1997) and word-final consonants (e.g., Baptista & Silva Filho, 1997; Koerich, 2002; Silva Filho, 1998; Silveira, 2002, 2007; Yavas, 1997). A number of these studies have dealt with Brazilian learners of English and the syllable simplification strategies they resort to in order to pronounce syllabic patterns not permitted in Brazilian Portuguese (BP).

In English, all consonants except /h/ can appear in syllable-final position. Conversely, in BP only four consonants are permitted in syllable-final position: the /r/ (realized, depending on regional variety, as a trill, velar fricative, flap, or even retroflex), the lateral /l/, the nasal archiphoneme /N/, and the sibilant archiphoneme /S/ (Câmara, 1970; Collischonn, 1996). However, even these are rather marginal in the coda: the /r/ tends to be deleted (*comer* “eat” [ko'me]); the /l/ is generally realized as the glide [w], or more rarely, as a dark [ɫ]<sup>1</sup> (*mal* “bad” [maw] or [maɫ]); the /N/ loses its consonantal feature with the preceding vowel diphthongizing and

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1. See Collischonn (1996) and Monaretto, Quednau and Hora (1996)

assimilating the nasal feature (*bom* “good” [bõw]; leaving only the /S/ as a final consonant phonetically. Due to these constraints on syllable structure, BP speakers tend to resort to vowel epenthesis to break up cross-syllabic consonant clusters in the L1. Thus, words which have not been officially modified to adapt to contemporary BP phonotactic constraints,<sup>2</sup> such as *pacto* (“pact”) and *advogado* (“lawyer”) are pronounced with the epenthetic vowel /i/ or /e/, giving [ˈpakitu] and [ˈadivoˈgadu] respectively.

This very productive L1 process is also known to be a frequent syllable simplification strategy in BP/English interphonology for structures such as (a) initial /s/ clusters (*stop* [isˈtapi]), (b) medial clusters (*substitute*: [suˈbistituti], frequently with change in word-stress), (c) final clusters (*faced*: [ˈfeisid/ˈfeisidi], and (d) word-final singleton consonants that are not permitted in BP (*map* [ˈmæpi]). The present study focused on the perception of English syllable-final, more specifically word-final, consonants by Brazilian learners. It investigated the effects of instruction on the perception of English word-final consonants by Brazilian learners, i.e., the discrimination of the syllabic patterns CVC versus CVCV. Koerich (2002) has shown that learners who have difficulty producing this distinction tend to be the ones who have difficulty perceiving it; i.e., they may hear a word such as *fog* (CVC) as *foggy* (CVCV) and vice-versa.

Some studies have shown that learners tend to build their L2 phonetic system upon the L1 system (e.g., Flege, 1987; Baptista, 2000). According to Flege (1995), they perceive the L2 sounds through the “filter” of the L1, which makes it difficult for them to notice certain features that are somehow different from features in similar sounds in their L1. Flege claims that his *speech learning model* (SLM) refers specifically to segments – “position sensitive” (1995, p. 239) phones. However, Koerich’s (2002) findings regarding the discrimination, by BP-speaking learners of English, of word-final consonant versus word-final consonant plus vowel seem to indicate that perception of the L2 through reference to the L1 can also interfere with the learning of L2 syllable structure, or at least of the L2 rhyme.

A way of coping with this problem might be to make learners aware of the differences between the syllable structures of the two languages, as well as to show how the inappropriate transfer of L1 phonological processes

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2. Other words, such as *batismo* (“baptism”) and *acidente* (“accident”) have officially lost the offending consonants, the letters “p” (/p/) and “c” (/k) respectively, dispensing the necessity of epenthesis.

(epenthesis) can hinder communication in the L2. This new awareness should lead to better discrimination of the CVC versus CVCV syllable structures, giving learners the opportunity to internalize the new syllable structure and, thus, ultimately produce final consonants more accurately. A combination of explicit instruction and practice of the CVC syllable structure and communicative activities using the structure might, then, be an effective way to teach the pronunciation of syllable-final consonants. The original research tested both perception and production of the English CVC structure, but this paper reports only the perception results. Thus, assuming that better discrimination will ultimately lead to better production, the purpose of this study was to find out whether pronunciation instruction based on these two approaches can lead to better discrimination between words ending in a CVC pattern and words ending in a CVCV pattern. The hypothesis was the following:

Instruction on English syllable structure and word-final consonants will lead to greater improvement by the experimental group than the control group in the discrimination of the contrast between the syllabic patterns CVC and CVCV, as measured by a pre and post oddity discrimination test.

### 3. METHOD

#### 3.1. *Participants*

Participants were two groups of first-semester English students from the English extension program of a major Brazilian university, a mixture of real and false beginners, many having had some English in high school. Most were graduate or undergraduate university students pursuing various majors, a few were junior high students, and some just people from the community. It was not possible to randomly select students or to match the groups for proficiency level, but the two groups were expected to be quite similar. The experimental group began with 16 students but was reduced to 12 (6 males and 6 females) with ages ranging from 18 to 28 ( $M = 21.83$ ,  $SD = 3.01$ ), and the control group began with 15 students and was reduced to 10 (7 males and 3 females) with ages ranging from 14 to 22 ( $M = 18.88$ ,  $SD = 2.66$ ). Reductions were due to the elimination of students who did not complete all the tasks of the dataset.

### 3.2. *Discrimination pretest and posttest*

To test whether or not the participants could perceive the difference between monosyllabic words ending in a consonant (e.g., *fog*) and disyllabic words ending in the same consonant followed by /i/ (e.g., *foggy*), an *oddity discrimination test* was developed, based on Flege, Munro & Fox (1994) with some adaptations. The consonants included in the discrimination test were /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, and /ŋ/. All word pairs were minimal pairs consisting of a CVC/CVCV structure, with no consonant clusters and where the disyllabic word ended in /i/. A native speaker of American English recorded the sentences used in the discrimination test. The test contained sets of three sentences (Flege et al.'s version included sets of isolated syllables), where one contained a target word that differed from the other two of the same set. The carrier sentence was always "Say ... now," as in the set below, where sentence "b" contains the odd item:

- a. Say *move* now.
- b. Say *movie* now.
- c. Say *move* now.

Each target consonant appeared in two of the change trials – one where the odd item out was the monosyllabic word and one where it was the disyllabic word – giving 24 target *change trials*.

A further adaptation of the original oddity discrimination test was the inclusion of six distracter change trials containing words dealing with other difficult vowel and consonant contrasts. These distracters were included to avoid giving away the target sounds being tested. The test also included eight *catch trials* (as in Flege et al.), where the three sentences of the set were identical: two of the catch trials contained distracters, and six of them contained the target consonant sounds /p/, /t/ and /k/. Thus, the discrimination test had a total of 38 sets of sentences; ten of the sets contained a different word in item "a", ten in item "b", ten in item "c", and eight of them (the catch trials) had no different words at all. The catch trials were expected to give some guarantee that the participants were paying attention to the three sentences of each trial, but the main analysis was based only on the change trials.

### 3.3. *Pronunciation manual*

A pronunciation manual developed specifically for this study was used with the experimental group, together with the regular textbook *New Interchange I* (Richards, Hull & Proctor, 1997), during the instructional period. The content of the manual was limited to activities for teaching learners the differences between English and Brazilian Portuguese syllabic patterns and the inappropriateness of the use of an epenthetic vowel to overcome the articulatory problems posed by these differences. The activities developed for practice included vocabulary items with the same word-final consonants as in the discrimination test – /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, and /ŋ/ – but the three nasals were not practiced for lack of time. [Mike, do you think the name of the textbook should be included? It sounds like we're advertising it.]

The manual was organized according to the communicative framework suggested by Celce-Murcia et al. (1996), i.e., consisting of the following five steps: (a) description and analysis; (b) training in perception; (c) controlled practice and feedback; (d) guided practice with feedback; and (e) communicative practice and feedback. There was also an attempt to integrate the pronunciation component with the rest of the language syllabus and to adjust it to the learners' level of proficiency.

### 3.4. *Procedures*

The data collection procedures were carried out separately for the experimental and control groups, and the discrimination and production tests were given in a single session for each. The pretest was administered to both groups in the seventh week of the course, just before the experimental group started their pronunciation instruction, and the posttest was given one week after the conclusion of the experimental group's period of pronunciation instruction.

Before beginning the discrimination test, the participants received a brief training session with three sets containing difficult vowel and consonant contrasts (similar to the distracters) to become familiar with the task. It was necessary to give the training session twice to make sure all participants understood. For both the training session and the test

itself, participants were given a sheet of paper on which, for each set, they checked “a”, “b”, or “c” for the sentence that was different; or *todas iguais* (“all the same”) if the three sentences were the same. The same procedures and materials were used in the posttest.

The English course was a 45-hour course, taught in one semester in thirty 90-minute classes meeting twice a week for 15 weeks. For the experimental group, the pronunciation lessons took up about 40 minutes of one weekly class for a period of six weeks, resulting in four hours of pronunciation instruction. These lessons were based on the manual described in 3.3., and although the activities focused on pronunciation, they were also intended to be an opportunity to practice or revise the content presented in the textbook that was used as the main material in the course. During this time the control group received no pronunciation instruction regarding the features investigated, but just had more time for the normal activities in their regular textbook. The researcher was in charge of teaching both the experimental and the control groups.

#### 4. RESULTS AND DISCUSSION

As stated in section 3.1, the experimental and control groups were expected to be of approximately equal proficiency. However, although the two groups obtained similar scores in the first general language skills written exam, this expectation was not borne out regarding the discrimination of CVC and CVCV patterns. Table 1 shows that the control group demonstrated better discrimination of the CVC versus CVCV patterns than the experimental group in the pretest change trials: 75% ( $M = 18$ ;  $SD = 3.98$ ) compared to 61% ( $M = 14.67$ ;  $SD = 4.25$ ) respectively. An independent sample Mann-Whitney<sup>3</sup> test showed this difference to be significant ( $z = -1.88$ ;  $p = .05$ ); thus, the control group was significantly better in discriminating the two syllable structures in the pretest than the experimental group.

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3. The Mann-Whitney test was used instead of the t-test because of the small number of subjects in each group.



	Control Group N = 240 (10 x 24)		Experimental Group N = 288 (12 x 24)	
	Pretest	Posttest	Pretest	Posttest
No. correct	180	200	176	222
% correct	75	83	61	77
Mean per partic.	18.00	20.00	14.67	18.50
SD	3.89	3.65	4.25	5.30

**Table 1. Frequency of correct responses in change trials of the discrimination test**

Because the control group performed so much better on the pretest, the pronunciation instruction would have to produce outstanding results for the experimental group to outperform the control group in the posttest. This did not happen. The control group continued to perform better in the posttest: 83% ( $M = 20$ ;  $SD = 3.65$ ) compared to 77% ( $M = 18.50$ ;  $SD = 5.30$ ) respectively. However, in the posttest the difference was only 6 percentage points, which the Mann-Whitney test showed to be no longer significant ( $z = -.47$ ,  $p = .63$ ). The fact that the difference between the two groups was significant before treatment and was no longer significant after the treatment suggests a possible tendency for the treatment to have made a difference in the discrimination performance of the experimental group. To confirm or not this tendency, it is necessary to examine the gain scores from the pretest to the posttest.

The results displayed in Table 2 show that, in general, the experimental group obtained higher gain scores ( $M = 3.83$ ,  $SD = 4.09$ ) than the control group ( $M = 2$ ;  $SD = 4.55$ ). However, an independent sample Mann-Whitney test showed that, although the mean gain score for the experimental group was almost twice that of the control group, this difference between the gain scores of the two groups was not significant ( $z = -.64$ ;  $p = .52$ ). Thus, while it appears the pronunciation instruction might have had a slight effect on the experimental group's ability to discriminate the CVC and CVCV patterns, this hypothesis cannot be confirmed.

The lack of significance in these results was probably influenced by the high standard deviations – greater than the means for both groups, which highlights the power of individual differences, a crucial factor in SLA classrooms and research. It can be seen in the table that only one

participant in each group (S1 and S13) achieved an increase of 10 points or more in their rates of correct responses in the discrimination posttest, and one participant in each group (S3 and S21) actually obtained worse results in the posttest. It is tempting to speculate that the somewhat higher gain scores of the experimental group may be related to the pronunciation instruction they received and that larger groups might have yielded significant results. Nevertheless, most participants in the control group also showed some improvement in their performance on the posttest, suggesting that other factors besides instruction might have influenced the posttest results, such as task familiarity and exposure to L2. Furthermore, it is important to remember that the experimental group had a much worse performance on the pretest than the control group; thus, there was more room for improvement for the former than for the latter.

Control Group		Experimental Group	
Participant	Score	Participant	Score
S1	10	S11	9
S2	2	S12	3
S3	-8	S13	12
S4	1	S14	1
S5	3	S15	8
S6	1	S16	1
S7	7	S17	2
S8	0	S18	5
S9	3	S19	1
S10	1	S20	5
		S21	-2
		S22	1
Total	20		46
Mean per partic.	2.0		3.83
SD	4.55		4.09
Maximum	10		12
Minimum	-8		-2

**Table 2. Gain scores in the discrimination test from pretest to posttest**

In addition to the small groups and the large variability in the results, there are several factors to be considered about the test design itself. On the one hand, as explained in 3.2, the role of the catch trials was to verify whether the participants' responses were not mere guesses, as guessing

would frequently have led to choosing an odd item out when there was none. The participants managed to correctly identify more than 80% of all catch trials in the pre and posttests. These results seem to indicate that the participants were not merely making wild guesses in the discrimination test, and thus, that the results can be assumed to faithfully represent how often the participants were actually discriminating between the pairs in the change trials.

On the other hand, there may have been an effect of the position of the odd item in each trial. There were a total of 24 change trials, where the odd item could appear in first, second, or third position. The odd targets that appeared in third (“c”) position tended to trigger the lowest error rates for both experimental and control groups in the pretest, whereas for the posttest, the three positions yielded similar rates. This result suggests a possible drawback in the design of the discrimination test, which relied heavily on the participants’ ability to hold three sentences in their memories for each set and to compare them in order to identify a subtle phonological distinction. This drawback may have been less important in the posttest because of a practice effect.

## 5. CONCLUSION

An oddity discrimination test testing discrimination of CVC/CVCV pairs was given to an experimental and control group of Brazilian learners of English before and after the experimental group underwent a six-week pronunciation instruction period on English syllable structure and word-final consonants, while the control group was given only normal language instruction. The results show (a) that the experimental group had significantly more difficulty with the CVC/CVCV distinction before instruction than the control group; (b) that the experimental group continued to perform somewhat worse after treatment, but the difference was no longer significant; and (c) that there was a tendency for greater improvement on the posttest for experimental group, but the differences were not significant. Improvement in the posttest was found for both the experimental and the control groups, which suggests that pronunciation instruction is not the only factor influencing the acquisition of English codas and thus the ability to perceive word-final consonants as word-final. Therefore, it is possible that language exposure per se helped learners to

begin to discriminate between the CVC and CVCV syllabic patterns. Although the non-significant results can only suggest and not confirm a possible effect of the pronunciation instruction, there were several limitations to the study, which might have interfered in the results.

In addition to the small number of participants in each group, the test design itself may have caused the participants some difficulty due to the use of sentences, rather than isolated items. Memory limitations may have made those trials with the odd item in the first or second position more difficult than those where it appeared in last position. While the equal distribution of all targets among the three positions should not have biased the results in terms of which targets were more difficult, this may have made the test more difficult for those participants with lesser short-term memory capacities and thus masked improvement. This problem suggests that the use of an oddity discrimination test might not be the best way of collecting data with beginners, or possibly that this test should not be used with sentences.

Another limitation of the study may have been the limited time of the instructional period. While extensive practice is expected to contribute to the automatization of the phonological component (Baptista, 1995), in the present study the experimental group received a total of only four hours of pronunciation teaching. This may have been insufficient for the development of procedural knowledge concerning English codas, which could otherwise have led to the adequate perception of the word-final consonants by the experimental group.

A major difficulty of the study was the non-equivalence of the groups before treatment regarding discrimination of the relevant structures. This made it difficult to evaluate the effectiveness of pronunciation instruction, but it also showed the power of individual differences in SLA. Future research should ensure that the groups being compared possess similar initial abilities regarding the discrimination of word-final consonants, so that the assessment of the effects of pronunciation teaching can be facilitated. In addition, long-term data needs to be collected in order to investigate whether the effects of pronunciation instruction last longer than a week after the instruction period ends, which was when the posttest was administered in the present study.

Thus, the small numbers of participants, the test design, the limited time period of instruction, and the non-equivalence of the groups may have impeded the attainment of significant results. However, even if results had been significant, they would have been relevant only for beginning learners, the level dealt with in this study. Future research could address the effectiveness of pronunciation teaching with more proficient learners in order to investigate whether these learners are more resistant to change than beginners. Also, with more proficient learners the instructional method could have been more communicative.

Despite the limitations of this study, it is hoped that it has contributed to the area of pronunciation teaching by bringing together theory, research and practice in the development and testing of pronunciation materials. The study was innovative in its attempt to show the effectiveness of including in English pronunciation teaching explicit instruction on the English syllable, a structure shown in various interphonology studies to be difficult for many L2 learners but as yet rare in pronunciation manuals. Although it is not possible to affirm that including the syllable in the English pronunciation syllabus led to better discrimination of English CVC/CVCV structures by Brazilian learners, there did appear to be a tendency in that direction, sufficient to encourage similar endeavors without the limitations of this exploratory study, which might achieve more conclusive results.

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E-mail: rosanesd@uol.com.br

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