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11

THE INFLUENCE OF PRONUNCIATION INSTRUCTION ON THE PERCEPTION AND PRODUCTION OF ENGLISH WORD-FINAL CONSONANTS

Rosane Silveira

Pós-Graduação em Inglês
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This book presents the results gathered by the author's doctoral study, which investigated the role of pronunciation instruction in the acquisition of L2 pronunciation. Drawing on the well-known framework for pronunciation teaching proposed by Celce-Murcia, Brinton and Goodwin (1996, reprinted in 2010), pronunciation materials focusing on English word-final consonants were designed with the Brazilian learner of English in mind. In addition to the effect of pronunciation instruction, the study investigates several factors suggested by L2 phonology research as influencing the acquisition of the phonological system: (a) different syllabic patterns of the L1 and the L2; (b) markedness; (c) orthography; and (d) phonological environment (pause, consonant and vowel). In addition, Silveira considers the role of lexical knowledge and order effect, as well as the effects of the pronunciation instruction period on the learning of the rest of the language syllabus.

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To Adriano and Gabi
To Barbara Oghton Baptista, a great adviser

That is what learning is.
You suddenly understand
something you've understood
all your life, but in a new way.
(Doris Lessing)

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ABBREVIATIONS

BP	Brazilian Portuguese
C	Consonant
CAH	Contrastive Analysis Hypothesis
CPH	Critical Period Hypothesis
ESL	English as a Second Language
L1	First language
L2	Second language
MDH	Markedness Differential Hypothesis
SCH	Structural Conformity Hypothesis
SLA	Second Language Acquisition
SLT	Second Language Teaching
UCSS	Universal Canonical Syllable Structure
UG	Universal Grammar
V	Vowel
#	Word boundary

Preface

This publication is the result of my doctoral degree research, conducted from 2000 to 2004 at the *Programa de Pós-Graduação em Inglês* at *Universidade Federal de Santa Catarina*. The inspiration for starting this study came from my supervisor, Professor Barbara Oughton Baptista, who taught me, from the very beginning in my first semester as an undergraduate student, the importance of studying the sound system of a second language (L2) in order to be able to speak it effectively.

At the time my study was being conducted, the research group led by Professor Baptista was also being consolidated, and this process culminated in 2004 with the creation of the CNPq research group called NUPFFALE – *Núcleo de Pesquisa em Fonética e Fonologia Aplicada à Língua Estrangeira*. The present study addresses some of the central issues regarding L2 phonology that have been investigated by this research group: syllable structure (e.g., Carlisle, 2010; Rebello & Baptista, 2006), markedness (e.g., Baptista & Silva Filho, 2006; Eckman, 2009; Eckman & Iverson, 1994), phonological environment (e.g., Carlisle, 1991, 1994; Delatorre & Koerich, 2008), the relationship between perception and production (e.g., Flege, 1999; Koerich, 2002, 2006) and L1spelling-sound transfer (e.g., Koerich, 2002; Alves, 2004).

Nonetheless, the main contribution of the present work was the investigation of the role of pronunciation instruction in the acquisition of L2 pronunciation. For this, the well-known framework for pronunciation teaching proposed by Celce-

Murcia, Brinton and Goodwin (1996, reprinted in 2010) was adopted, and pronunciation materials focusing on English word-final consonants were designed with the Brazilian learner of English in mind. My interest in the role of instruction led me to work with two other researchers in a joint project of writing a book that reviews important L2 phonology study results and their implications for pronunciation teaching in Brazil, in addition to proposing pronunciation activities for the L2 classroom (Zimmer, Silveira, & Alves, 2009).

Since 2004, the field of L2 phonology has advanced and new research perspectives and variables have been introduced. There follows a brief overview of the topics covered in the 2007, 2010, and 2013 proceedings of the main international event in the field – New Sounds: International Symposium on the Acquisition of Second Language Speech:

- The effect of training/instruction on perception and production (e.g., Bettoni-Techio & Koerich, 2008; Carlet & Cebrian, 2014; Nobre-Oliveira, 2008; Lacabex, García Lecumberri, & Cook, 2008; Kim & Hazan, 2011; Cardoso, 2011);

- The role of word frequency in L2 speech perception and/or production (Cardoso, 2011; Gomes, 2008; Moras, 2014) based on usage-based phonology (Bybee, 2002),

- Intelligibility[1] and the pronunciation teaching curriculum (Beinhoff, 2014; Kopečková, 2011; Fabra & Juan-Garau, 2011; Piske, Flege, MacKay, & Meador, 2011);

1. Intelligibility has a number of definitions, but here the term is being used following Jenkins (2000, p 78), who defines it as "the production and recognition of the formal properties of words and utterances, and, in particular, the ability to produce and receive phonological form."

- The role different acoustic cues (i.e., formant frequency, duration), often referred to as cue weighting (Holt & Lottos, 2006), play in the categorization of speech sounds (Lacabex & Lecumberri, 2011; Hamann, Boersma, & Ćavar, 2011; Perozzo & Alves, 2014);

- The way phonological awareness, that is "one's ability to recognize, discriminate, and manipulate the sounds" (Anthony & Francis, 2005), can predict the acquisition of sound inventories (Babatsouli & Kappa, 2011; Jilka, Lewandowska, & Rota, 2011; Lacabex & Puerto, 2014);

- The extent to which non-linguistic variables such as age, task type, learning experiences, and education are correlated with performance on pronunciation tests (Aoki, 2011; Baran-Lucarz, 2014); MacKay & Fullana, 2008; Silveira, 2008);

Despite the new directions L2 phonology studies have been taking, the present research is a relevant contribution for those interested in the development of the Portuguese-English phonology of Brazilian learners, especially regarding the acquisition of English phonotactics by this group of learners. The work is also relevant for pedagogical purposes, as it describes the difficulties faced by Brazilian learners when dealing with English word-final consonants, and suggests interesting activities to deal with these difficulties.

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1. Introduction

1.1 Background to the study

Several researchers and educators have made a strong case for the importance of pronunciation teaching as a means of helping learners develop communicative ability (e.g., Pennington 1994; Morley, 1991 and 1994; Celce-Murcia et al., 1996). Nevertheless, the pronunciation component has been greatly neglected in the language classroom and materials. Moreover, when this component is present in course books, it tends to be piecemeal, isolated from other language skills, and focused mostly on descriptive and controlled tasks.

As observed by Pennington (1994), the importance of pronunciation instruction lies in the fact that it can help learners to develop their interlanguage phonology by giving them "the perceptual and the productive experience they need to reconceptualize the performance targets while offering motivation to change and social experiences to develop a new value set" (p. 105).

Pronunciation instruction was absent from the ESL[1] classroom for a long time due to the conventional beliefs that pronunciation is not important, can be "picked up" by learners, and is difficult to teach (Morley, 1994). According to Morley, these beliefs have been questioned and pronunciation teaching has undergone a shift, so that nowadays, pronunciation instruction

1 In this work, English as a Second Language and English as a Foreign Language will be used interchangeably, unless a distinction is made by an author that is cited in the text.

frameworks encompass not only linguistic competence, but also discursive, sociolinguistic and strategic competence. Morley (1991) also proposes that the pronunciation curriculum has to be based on realistic goals. A curriculum which sets out to develop learners' native-like pronunciation is destined to frustrate both learners and instructors, especially if the learners have started learning the L2 after the age of puberty. Morley proposes four realistic learner goals for pronunciation instruction: (a) functional intelligibility[2], (b) functional communicability, (c) increased self-confidence and (d) speech monitoring abilities and speech modification strategies for use beyond the classroom.

The implementation of pronunciation teaching in the L2 classroom requires several measures (Morley, 1991). First, it is necessary for ESL teachers to possess a background in applied English phonetics and phonology. Second, there has to be an effort to develop pronunciation and speech methodologies, techniques and materials. Third, more evaluative measures and methods have to be developed to verify learners' intelligibility and communicability improvement. Fourth, researchers have to continue to investigate various aspects of L2 phonology. Finally, there is a need for controlled studies that investigate the effects of specific pronunciation teaching procedures on the development of learners' pronunciation. The present study is concerned mainly with the second and last measures pointed out in this paragraph, that is, the design of pronunciation techniques and materials and the investigation of the effects of instruction on pronunciation development.

Studies on the effects of pronunciation instruction have concentrated on some of the needs in this area, for example, (a) testing the validity of a multimodal methodology (Elliot, 1995;

2 In this text, Morley does not present a definition for the term intelligibility. We can infer that she uses it as a synonym for speech that can be easily understood. The author highlights, however, that the term is slippery, and that "intelligibility may be as much in the mind of the listener as in the mouth of the speaker." (Morley, 1991, p. 499).

Quijada, 1997), (b) using more controlled teaching techniques (Neufeld, 1977; Strange & Dittman 1984; Jamieson & Morosan, 1986), (c) using silent practice as a means to develop perceptual (Matthews, 1997) and productive skills (Neufeld, 1977), (d) testing the effect of immediate feedback (Jamieson & Morosan, 1986; Matthews, 1997), (e) linking pronunciation to the normal language curriculum (Quijada, 1997), and (f) checking the effect of explicit instruction and visual demonstration of sound articulation (Matthews, 1997). In addition to these issues, some studies have compared the effectiveness of different types of instruction (Macdonald, Yule & Powers, 1987) and checked the delayed effects of pronunciation instruction (Yule, Hoffman & Damico, 1987; Macdonald et al., 1987). The studies mentioned so far are insufficient to provide a conclusive answer about the role played by instruction in the development of pronunciation. While some of the studies indicate that instruction is ineffective (e.g., Macdonald et al., 1987; Quijada, 1997), others propose the opposite (e.g., Elliot, 1995; Matthews, 1997).

Although several of the measures listed by Morley (1991) for pronunciation instruction have been addressed by a few studies, a major gap in the literature is the absence of a clear link between research objectives and the assumptions made by theories of Second Language Acquisition (SLA) and interphonology (i.e., interlanguage phonology). In addition, it is necessary to conduct a greater number of studies in the area of pronunciation instruction in order to develop more controlled and effective research design, so that the results yielded by these studies can be more comparable and reliable. It seems that the link between theory and research, together with careful research designs and sufficient research results, may have two effects. First, it could help educators realize the importance of pronunciation instruction in the language curriculum. Second, writers of pronunciation textbooks and language materials which focus on the fours skills might be able to re-evaluate the extent to which their work is

appropriately addressing the pronunciation component, and thus make suitable modifications.

The area of pronunciation instruction is also controversial in regard to materials design. An analysis of textbooks used to teach English in Brazil shows that these materials do not follow a communicative approach to pronunciation teaching, as they do not emphasize communicability and intelligibility. In some books the pronunciation component is completely absent (Richards & Sandy, 2000); in others, pronunciation is dealt with sporadically, focusing on the spelling-sound relation (O'Neil, Mugglestone, & Anger, 1992). There are books (Richards, Hull, & Proctor, 1990, 1997) that contain a pronunciation exercise in each unit, but these exercises are generally very limited, consisting of a quick presentation and a task where learners should imitate a model. Some pronunciation manuals have included, and sometimes integrated, a wide range of information on segmentals and suprasegmentals (e.g., Prator & Robinet, 1985; Orion, 1988; Hagen & Grogan, 1992; Gilbert, 1993; Hewings, 1993). There is some variation in the way segments and suprasegmentals are presented and the amount of attention given to each of their subcomponents. However, despite the effort to include some pronunciation aspects, the manuals still fall short of offering tasks that range from more controlled to more communicative. The limitations of both textbooks and pronunciation materials indicate that authors are still struggling to reconcile the pronunciation component with the orientations of the Communicative Approach to language teaching.

In light of the limitations of faced by pronunciation instruction, it is important to carry out research that aims to bring together Second Language Teaching assumptions, interphonology research findings and classroom practice. As Baptista (2000) points out, the theory-research-practice interface is rarely found in the area of pronunciation instruction, and, on the rare occasions when this interface occurs, it is made without

an explicit link (e.g., Celce-Murcia et al., 1996) or is limited to a few aspects (e.g., Pennington, 1994). Baptista attributes this separation between research, theory and practice to the scarcity of studies testing the effects of pronunciation instruction and to the controversial results obtained by the few studies in the area.

The field of SLA has developed considerably over the past fifty years and thus can contribute greatly to the implementation of pronunciation instruction. Some of the variables that have been investigated in an attempt to build a model for SLA, and that are relevant to a discussion of pronunciation instruction, are the role of the following: (a) L1; (b) Universal Grammar (UG); (c) age; (d) similarity, dissimilarity and markedness of linguistic structures; and (e) formal instruction. In the area of interphonology, a growing number of studies have examined the acquisition of the L2 syllabic inventory by focusing on consonant clusters (e.g., Broselow, 1987; Eckman, 1991; Carlisle, 1991; Abrahamsson, 1997; Rebello, 1997; Rauber, 2002; Cornelian Júnior, 2003) and/or word-final consonants (e.g., Yavas, 1997; Baptista & Silva Filho, 1997; Silva Filho, 1998; Koerich, 2002; Silveira, 2002a). A few of these studies have dealt with Brazilian learners of English and the syllable simplification strategies they resort to when they need to pronounce syllabic patterns that are not permitted in Brazilian Portuguese (BP).

Vowel insertion is a very frequent syllable simplification strategy in BP (Fernandes, 1997). This strategy can be resorted to with (a) word-final consonants that are not permitted in BP (*map*: [‘mæpi̲]), (b) initial /s/ clusters (*stop*: [i̲s’tap]), (c) medial clusters (*MacDonald*: [mɛki̲’donawdi][3]), and (d) final clusters (*faced*: [‘fejsi̲d]). The scope of the present study is the acquisition of English word-final consonants by Brazilian learners. The difficulty posed by these word-final consonants

3 When followed by [i̲], /t/ and /d/ are generally palatalized in BP. Palatalization will not be represented in the broad transcriptions used for the examples, but might appear with examples that come from the real data set or that are relevant for the discussion.

seems to be related to the differences between English and BP syllable inventories. In English, all consonants, except for /h/, can appear in word-final position.

Conversely, in BP only four consonants are permitted in syllable-final position: the archiphoneme /R/ (realized, depending on regional variety, as a trill, velar fricative, flap, or even retroflex), the lateral /l/, the nasal archiphoneme /ŋ/, and the sibilant archiphoneme /S/ (Câmara, 1970; Collischonn, 1996). However, even these are rather marginal in the coda: the /R/ can be deleted (*comer* "eat" [ko'mɛ]); the /l/ is generally realized as the glide [w], or more rarely, as a dark [ɫ][4] (*mal* "bad" [maw] or [maɫ]); the /N/ loses its consonantal feature with the preceding vowel diphthongizing and 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 insertion 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,[5] such as *pacto* ("pact") and *advogado* ("lawyer") are pronounced with the epenthetic vowel /i/ or /ɐ/, giving ['pakitu] and [adivo'gadu], respectively. Due to these constraints on the L1 syllable structure, Brazilian Portuguese speakers tend to insert a vowel [i] or [ɐ] (Câmara, 1970) to pronounce consonant clusters not permitted in the L1 (e.g., *pacto* "pact" ['pakitu]); and the same process takes place in the L2 (e.g., *game* ['gejmi]).

Baptista and Silva Filho (1997) propose a hierarchy of difficulty for word-final consonants (from least difficult to most difficult): nasals, oral stops (and within this category, first the bilabials, followed by the alveolars and the velars), fricatives, and affricates. As regards voicing, for almost all voiced/voiceless

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

5 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 vowel insertion.

pairs, the voiced consonant in these pairs causes more paragoge. In addition to (a) voicing, (b) place of articulation, and (c) manner of articulation, the phonological environment can contribute to making the pronunciation of final consonants more difficult. In Baptista and Silva Filho (1997), word-final consonants are more difficult to pronounce when followed by a consonant than by a vowel or a pause, which is the easiest context.

Brazilians face many pronunciation problems due to the differences between the syllabic patterns of their L1 and English, and they transfer L1 syllabic patterns while pronouncing English words, which, for word-final consonants, frequently results in the use of a syllable simplification strategy known as paragoge - the addition of vowel to most consonants in coda position (e.g., *game* [ˈgejmi]). Despite its importance, the syllable has often been absent from curriculum components and pronunciation materials. For the reasons previously described, the syllable should be an essential component of pronunciation courses designed for Brazilian learners.

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, as these textbooks and manuals are published to be used in mixed ESL (English as a Second Language) and EFL (English as a Foreign Language) classes all over the world. Thus, there is a need for books published in the EFL country where they will be used, and these books should take into account the L1 factor. The literature in the field of second/foreign language acquisition shows that the learner's L1 is a major factor in the acquisition of the L2 phonetic-phonological system (e.g., Major, 1994; Carlisle, 1994; Rebello, 1997; Baptista & Silva Filho, 1997). Some studies have shown that learners tend to build their L2 phonetic-phonological system upon the L1 system (e.g., Flege, 1987; Baptista, 1992), which makes it difficult for learners to acquire certain features that are somehow different in the L1 and the L2. It seems that

a way of trying to cope with this problem is to make learners aware of the differences between the two phonetic-phonological systems, as well as show how the inappropriate transfer of L1 system features can hinder communication in the L2. This could help learners realize why they have difficulty making themselves understood while speaking the L2, and hopefully make them more motivated to improve their pronunciation. In addition to motivation, pronunciation teaching should provide learners with activities to minimize the effects of L1 transfer and maximize the transfer of features that are common to the L1 and the L2.

1.2 Statement of purpose

This study investigates the effects of instruction on the acquisition of English word-final consonants by Brazilian learners. Special attention is given to the occurrence of vowel paragoge in English syllables that violate the phonotactics of BP, and the extent to which this syllable simplification strategy affects both perception and production. Research has indicated that vowel paragoge is a recurrent phonological process in English spoken by Brazilians, and thus a relevant topic for pronunciation instruction. The main hypothesis guiding this research is that pronunciation instruction based on the principles of the Communicative Approach can help learners to acquire English word-final consonants.

The present research investigates the role played by pronunciation instruction in the acquisition of English word-final consonants by beginning-level Brazilian learners of English. It also addresses several factors suggested by interphonology studies as influencing the acquisition of the phonological system: (a) different syllabic patterns of the L1 and the L2, (b) markedness, (c) orthography and (d) phonological environment (pause, consonant and vowel). In addition, the present study

discusses the role of lexical knowledge, order effect and some individual differences variables, as well as the effects of the pronunciation instruction period on the learning of the rest of the language syllabus.

1.3 Significance of the study

Dedicating class time to help learners to cope with English word-final consonants without resorting to paragoge is important for two reasons. First, English native speakers' comprehension is greatly dependent on rhythm, and the use of paragoge interferes with comprehension, thus jeopardising communication (Garcia, 1990; Rebello, 1997). Second, inserting a vowel after word-final consonants is one of the main features of Brazilians' accent, and this may hinder successful communication with English L1 and L2 users who are not familiar with the Brazilian accent.

The present research is relevant to the area of interlanguage phonology for its original attempt to test the effects of pronunciation instruction in an area which has been shown to be problematic for Brazilian learners. In addition, this study is innovative in that it designed pronunciation material tailored to the needs of Brazilian learners of English and based on the communicative framework developed by Celce-Murcia et al. (1996).

Furthermore, like Koerich (2002), this study extends previous interphonology studies on the acquisition of syllabic structure by including not only production, but also perception data, to contribute to the discussion regarding the acquisition of word-final consonants in relation to markedness and to test some additional variables. Finally, the present study extends previous ones on the acquisition of word-final consonants (Baptista & Silva Filho, 1997; Koerich, 2002) by discussing the influence of lexical knowledge and individual differences variables.

1.4 Organization of the book

The next three chapters present the theoretical background for the present study. Chapter 2 presents a general picture of pronunciation instruction in the field of Second Language Teaching by reviewing studies that focus on this component at the theoretical and practical levels. Chapter 3 reviews some of the issues that have been investigated in an attempt to build a model for SLA, namely (a) L1 interference; (b) access to Universal Grammar (UG); (c) age constraints; (d) similarity, dissimilarity and markedness of the linguistic structures; and (e) formal instruction effects. The last theoretical chapter reviews several theoretical and empirical studies in order to verify the extent to which the factors influencing SLA can provide us with insights on how L2 learners acquire the syllabic inventories of the L2.

Chapter 5 describes the method employed to collect data for the present research, including information about the participants, the materials (perception and production tests, questionnaires, pronunciation manual and written exams), the procedures and the data analysis. Chapter 6 reports and discusses the results obtained in the present study for the perception and production pre and posttests, with a focus on the effects of pronunciation instruction on the performance of the experimental group. This chapter also includes the analysis of test design variables and markedness variables. Furthermore, the chapter investigates possible interactions between the perception and the production tests, and between the participants' performance on the written exams and individual differences variables. Chapter 6 also investigates whether the experimental group lagged behind in their knowledge of grammar and vocabulary, since part of their class time was used to provide pronunciation instruction. The chapter ends by discussing the experimental group's evaluation of the pronunciation instruction material and procedures. A total of 20 hypotheses are discussed in this chapter.

Finally, Chapter 7 addresses the theoretical implications for the areas of pronunciation instruction and interphonology research, based on the findings of the present study. The chapter also discusses the pedagogical implications of the research for the teaching of word-final consonants to Brazilian learners. The last section points out the limitations of the present study and gives suggestions for further research.

2. Pronunciation instruction: theoretical and practical issues

2.1 Introduction

The present chapter presents a general picture of pronunciation instruction in the field of Second Language Teaching (SLT) by reviewing studies that focus on this component at the theoretical and practical levels. The first section discusses the role of pronunciation instruction in the language syllabus, with a special focus on goals, content, classroom procedures and evaluation. The second section analyzes the way several course books and pronunciation textbooks deal with the pronunciation component. For the pronunciation textbooks, the analysis is restricted to the two components that are the focus of the present study: consonants and syllables.

2.2 Pronunciation and approaches to second language teaching

Pronunciation instruction was absent from the second/foreign language (L2) classroom for a long time due to conventional beliefs that pronunciation is not important, can be "picked up" by learners and is difficult to teach. These beliefs have been questioned and pronunciation instruction has undergone a shift, so

that nowadays its frameworks may encompass not only linguistic competence, but also discourse, sociolinguistic and strategic competence (Morley, 1994). The development of pronunciation instruction can be better understood if we analyze the history of the approaches to SLT. The following paragraphs present a brief review of the role played by pronunciation in the most influential approaches to SLT since the end of the 18th century. For a timeline of all approaches and methods, see Appendix F.

Grammar-Translation is an approach to SLT that had become well developed by the end of the 18th century, with the intent of making this discipline more suitable for teaching languages in the high school context (Howatt, 1984). Pronunciation instruction is not encompassed in the main goals of this approach, which aims at providing students with practice in sentence translation, and memorization of vocabulary lists and detailed grammar rules.

The Direct Method (or its later reincarnation, the Natural Approach (Krashen & Terrell, 1983)) prevailed in the 19th century, and it regards the process of learning[1] an L2 as being the same as that of acquiring an L1. The language lessons consist of conversation sessions about a specific topic, followed by question-answer practice. By listening to an appropriate model, L2 learners are expected to *spontaneously acquire* pronunciation (Howatt, 1984). Consequently, the methodology for pronunciation instruction consists of imitating a model offered by the instructor, who is expected to be a native speaker of the target language and not to use the learners' L1 in class. In the much later Natural Approach, the imitation can start after an initial "silent period", during which the learner listens to L2 samples, but is not required to speak (Celce-Murcia et al., 1996).

At the start of the 20th century, the Reform Movement, led by phoneticians and educators, establishes important changes in pronunciation instruction. As speech is a primary goal, pronunciation

1 The authors establish a distinction between learning and acquisition (see section 3.6.1). For the present study, however, both terms are used as synonyms.

is emphasized from the initial stages of language learning, with the classes being mostly taught in the target language. Phonetics plays an important role in SLT, and both teachers (not necessarily native speakers of the target language) and learners are provided with phonetic training. This approach rejects the idea that simple imitation leads to good pronunciation, and as a result, pronunciation is explicitly taught, with the aid of the phonetic alphabet. Indeed, in the initial stages, the sentences and texts used in class are written using the phonetic alphabet only, with the hope that learners would develop a more accurate pronunciation of the target language. The rationale behind this procedure is that if learners have access to texts with normal spelling in the initial stages of language learning, the acquisition of the target language phonological system becomes more difficult. After the pronunciation of the text or sentence (preferably complex and about relevant topics) is mastered, the learners move on to question-answer, discussion and retelling exercises (Howatt, 1984).

Audiolingualism and the Oral Approach (middle of the 20th century) emphasize pronunciation instruction from the start, as this was expected to contribute to the development of oral skills. The concept of phonemic contrasts is introduced in the language classroom, and it is believed to contribute to the improvement of learners' perception and production of the L2 sounds. The methodology for pronunciation instruction exploits the use of minimal pair drills and the imitation of appropriate models, which are best practiced in a language laboratory, an essential resource for these approaches. In addition, learners receive some form of phonetic information to help them improve their pronunciation. Thus, followers of Audiolingualism and the Oral Approach assume that pronunciation (as well as other linguistic features) is acquired through intense repetition and memorization of controlled sentences and dialogs, which lead to habit formation (Stern, 1983). These beliefs were greatly influenced by Behaviorism (Skinner, 1982).

Thus, during both the Reform Movement and Audiolingualism, pronunciation instruction occupied a relevant place in the language curriculum, but it was later de-emphasized with the development of the Cognitive Approach. The notion of habit formation and the supremacy of oral skills are rejected; in fact, the literate skills (reading and writing) are considered as important as the oral skills. The central belief guiding this approach is that language is governed by rules and that once learners have a deep understanding of these rules, they will be able to use them in meaningful situations (Stern, 1983). Therefore, in the Cognitive Approach, pronunciation instruction is considered a waste of time, since pronunciation is not something you learn, but acquire through practice with meaningful materials (Celce-Murcia et al., 1996).

The pronunciation component again occupies a special place in the language curriculum with the Silent Way method. Pronunciation is also taught from the very beginning, with the help of tools such as pointers, charts and colored rods of different lengths. It is believed that language learning involves conscious work, but that learners would be overloaded if they tried to cope with form and meaning simultaneously. Consequently, the lesson begins with a focus on the pronunciation of sounds, syllables or words, initially modeled by the instructor, who speaks little, just indicating what the learners are expected to do. The emphasis on pronunciation continues until the learners achieve a level of pronunciation that allows them to be understood by a native speaker. If necessary, the instructor provides the learners with further modeling on how to pronounce the target element, resorting to silent feedback such as gestures and silent mouthing (Stevick, 1971).

Pronunciation is also important for the method known as Community Language Learning. Its central beliefs are that private classes are the ideal condition for learning, and that learning is optimized when learners take decisions about the course content

and "listen" to themselves. The methodology follows many steps, but essentially, the learners decide what they want to learn and they practice the pronunciation of a specific utterance, divided into chunks, until they can produce it fluently. The instructor acts as a "human computer" that can be turned on and off by the learners to provide data for repetition drills as many times as they find necessary (Curran, 1976).

Finally, the Communicative Approach also acknowledges the importance of the pronunciation component, which is essential to accomplish the main goal of this approach -communication (Celce-Murcia et al., 1996). Different from many of the previous approaches that value pronunciation instruction, the Communicative Approach aims at intelligible pronunciation, rather than total accuracy. It states that traditional methods of pronunciation instruction are incompatible with the notion that language teaching should be communication-oriented. Despite recognizing the importance of pronunciation instruction, Communicative Approach followers tended to ignore it, or to focus exclusively on the suprasegmentals[2]. At present, the importance of both segmentals and suprasegmentals in the instruction of intelligible pronunciation is generally recognized (e.g., Morley, 1994; Pennington, 1994; Celce-Murcia et al., 1996). Regarding methodology and goals for pronunciation instruction, this approach proposes that pronunciation tasks should appeal to all kinds of learners and aim at a compromise between fluency and accuracy (e.g., Morley, 1991; Pennington, 1994; Celce-Murcia et al., 1996). This can be accomplished with the use of tools from other disciplines (e.g., relaxation exercises from psychology, voice modulation from theater arts), technology developments (e.g., pronunciation software, video and audio recorders), the consideration of sociopsychological factors (e.g., motivation, attitude toward the target language) and the learners'

2 This is particularly true for British materials such as Brazil (1991).

active participation in the selection of curricular objectives and in the learning process as a whole (Celce-Murcia et al., 1996).

Although the Communicative Approach has recognized the necessity of teaching pronunciation, this component is still absent from many communicative classrooms and materials. Moreover, teachers and materials developers who deal with pronunciation instruction have found it difficult to implement the teaching of pronunciation instruction according to the principles of the Communicative Approach. The following sections review central issues regarding the role of pronunciation instruction in the communicative language syllabus, namely, the goals, content, procedures and evaluation criteria for pronunciation instruction.

2.3 Pronunciation instruction and the language syllabus

The importance of incorporating pronunciation instruction in the L2 classroom lies in the fact that it can help learners develop their interlanguage phonology by giving them "the perceptual and the productive experience they need to reconceptualize their performance targets while offering motivation to change and social experiences to develop a new value set" (Pennington, 1994, p. 105). As the scope of pronunciation instruction has become more comprehensive, new directions regarding the goals, content and instruction procedures for pronunciation have been suggested. In this section, we shall take a look at some researchers' recommendations on how to implement pronunciation instruction in the classroom.

2.3.1 Goals

Achieving a balance between fluency and accuracy has been the central goal of many educators dealing with pronunciation instruction over the past 30 years. This general goal encompasses

the development of learners' (a) intelligibility, (b) communicative ability, (c) self-monitoring and self-correction strategies, and (d) ability to understand native and non-native speakers' fluent speech. In addition, pronunciation instruction should help learners (e) acquire the L2 phonetic-phonological system, and (f) deal with L1 inadequate transfer.

As Morley (1991) points out, the pronunciation curriculum has to be based on realistic goals. Therefore, a curriculum that sets out to develop learners' native-like pronunciation is destined to frustrate both learners and instructors, especially if the learners have started learning the L2 after their L1 has been fully acquired. Therefore, a more realistic goal for pronunciation instruction is to help learners to become fluent speakers of the target language. A fluent L2 learner must be able to perform a variety of communicative tasks (e.g., ordering a meal, taking part in a group discussion, making requests), and this requires work on communication strategies and intelligibility. Communication strategies such as making inferences, using circumlocution and hesitation devices, can help learners compensate for their limited knowledge of the L2 (Oxford, 2001). Developing intelligibility and communicative ability requires that learners be able to produce messages that can be understood by their listeners (Munro & Derwing, 1995) and to understand other people's utterances. Thus, it is necessary to develop learners' productive and perceptive skills. More specifically, learners should be able to (a) communicate orally with ease and efficiency, (b) produce the basic contrasts of the target language sound system and (c) understand fluent speech as produced by native speakers (Bowen, 1972).

As Pennington and Richards (1986) observe, the explicit teaching of pronunciation cannot be expected to generate immediate improvement in learners' performance. Indeed, research has shown that pronunciation development depends on learners' reaching an appropriate stage at the phonological level

(e.g., Matthews, 1997; Yule, Hoffman & Damico, 1987). Rather than yielding immediate results, pronunciation instruction has an important role as a tool to help learners gradually acquire the L2 phonological system. The results of pronunciation instruction are likely to appear first in controlled language use situations and ultimately, it is hoped, in spontaneous speech. Thus, Pennington and Richards propose that pronunciation teachers should devise long-term goals for pronunciation instruction, and help learners move from controlled to automatic performance.

Pronunciation instruction should also take into account the learners' L1, since it is one of the major sources of difficulty in trying to acquire the L2 phonological system. Thus, diminishing the effects of L1 transfer on the acquisition of the L2 phonological system should be another goal for pronunciation instruction. Pronunciation problems triggered by L1 transfer can be identified by referring to available interphonology research and by carrying out needs analysis for learners' pronunciation.

Providing learners with explicit information about the L2 phonological system, making them aware of the differences between the L1 and the L2 phonological systems, and offering them practice with perception and production to achieve satisfactory levels of intelligibility and communicability are important goals of pronunciation instruction. Nevertheless, this type of instruction is likely to be more effective if it provides learners with self-monitoring and self-correction strategies to enable them to continue working on pronunciation once they leave the classroom. Self-monitoring is the ability to identify inaccuracies in one's own L2 speech; after identifying the problems, learners might attempt to self-correct and produce language that is more target-like (Celce-Murcia et al., 1996).

Finally, it is important to point out that the goals of pronunciation instruction are more likely to be achieved if pronunciation is taught in conjunction with other language components, and if decisions regarding pronunciation instruction

take into account the learners' needs and objectives (Morley, 1994; Celce-Murcia et al., 1996). These two measures are also expected to motivate learners to undertake the study of pronunciation.

2.3.2 Content

Several authors propose different lists of appropriate contents for pronunciation instruction, including components that are traditionally connected with pronunciation, as well as more general components (e.g., Acton, 1984; Catford, 1987; Pennington and Richards, 1986; Morley, 1991, 1994; Celce-Murcia et al., 1996). Components connected with pronunciation involve working with (a) vowel and consonant contrasts, (b) intonation, (c) rhythm, (d) word and sentence stress, (e) word boundaries, (f) reductions, (g) syllable structure, (h) linking, (i) deletion, (j) substitution and (k) the relationship between spelling and sound. General components include non-verbal behaviors such as (a) body movements and (b) voice quality, as well as (c) command of grammar and vocabulary and (d) strategies to develop communicative ability and intelligibility.

When deciding about the content for pronunciation instruction, Celce-Murcia et al. (1996) point out that there are no fixed rules. The decision must take into account the type of learner, setting, institution, learners' L1 and course methodology. The content of the pronunciation syllabus should vary according to these factors.

2.3.3 Procedures

As Celce-Murcia et al. (1996) observe, the goals of pronunciation instruction are more likely to be accomplished if we use a variety of language instruction techniques to provide learners with practice that ranges from more controlled to more communicative. As we shall see in this section, several

techniques and tools have been suggested to implement pronunciation instruction.

An important tool for pronunciation instruction is the phonetic alphabet, which is intended to help learners dissociate spelling and sound, and is an additional and more accurate device to study the L2 phonological system. Besides, once learners gain practice in using the phonetic alphabet, they can use dictionaries with phonetic transcriptions to check the correct pronunciation of words, which gives them support for self-monitoring and self-correction. Despite its pedagogical validity, the use of the phonetic alphabet in the language classroom is still limited, which might be due to both a lack of appropriate teacher training and the haphazard use of different types of phonetic alphabets in textbooks, dictionaries[3] and pronunciation manuals.

Another tool associated with pronunciation instruction is the *minimal pair*, in which two words or sentences are used to contrast two sounds, or stress and intonation patterns that might pose difficulties for learners (e.g., *man* vs. *men*; *white house* vs. *White House*; *Didn't you?* (falling vs. rising intonation)). Despite all the criticism about their lack of contextualization, minimal pairs are still present in most pronunciation materials because they are useful for making learners aware of L2 phonological contrasts that might not exist in their L1, and they may be appropriate for more controlled perception and production tasks. Bowen (1972, p. 93) tried to contextualize minimal pairs by designing *minimal-pair response sentences* such as the following:

This pen leaks.	(Then don't write with it.)
This pan leaks.	(Then don't cook with it.)

In these sentences, the focus is still the contrast of two sounds, but they also show that, sometimes, the context in which

3 Most American dictionaries adopt a set of symbols not used in any phonetics books.

a word appears is insufficient to determine its meaning, and thus, it is necessary to be able to discriminate between L2 phonological contrasts. These sentences must be part of a situation, which can be easily illustrated, and which can show learners the meaning load of phonemes, such as /ɛ/ and /æ/ (*pen* vs. pan) in English. In addition, minimal pair sentences should include vocabulary that is relevant for the learners, and the two elements being targeted by the minimal-pair sentences should have approximately the same probability of being used in the carrier sentence. Such minimal pair sentences are hard to create, and it seems to be very difficult to maintain a real communicative environment in class by simply using this type of technique. However, this technique is an important tool for making learners aware of phonological contrasts and the importance of mastering them at the perceptual and productive levels.

The concern with accurate pronunciation also gave rise to visual aids to help learners with the production of L2 sounds, such as illustrations depicting lips, tongue and jaw positions to articulate sounds. As technology gets more sophisticated, we can also find videos made with the purpose of showing how sounds are articulated (e.g., *Pronunciation Power*, 1996). Another visual aid on which pronunciation instruction has occasionally relied is wall charts depicting some sort of phonetic alphabet, which can be used to make learners aware of pronunciation problems and cue self-correction (Underhill, 1994). For the instruction of prosody, authors tend to resort to graphic elements, such as bullets, arrows, and different font formats and sizes, and technological resources to illustrate pitch contour are also available (e.g., Praat). Particularly for the instruction of vowel duration, rubber bands can be useful, since the instructor can illustrate long (tense) vowels by expanding the band, and short (lax) vowels by letting the band contract (Gilbert, 1993), and, for specific audiences, spectrograms showing vowel duration differences can be useful too.

Repetition is a common practice in the pronunciation classroom, and it may take place with different types of tasks at word, sentence or text level: minimal pairs (words and sentences), tongue twisters, rhymes, songs, poems, shadowing, etc. An alternative kind of repetition is *silent practice*, in which learners just mouth or whisper the target word or sentence. More sophisticated forms of repetition are reading aloud, recitation or dramatization of texts, which rely on rehearsing based on a native speaker model. This type of activity also involves practice with non-verbal behavior by using the mirroring technique, i.e., by miming whatever a ntive speaker does with his/her body (Acton, 1984). Celce-Murcia et al. (1996) suggest a similar technique, which they call mirroring or shadowing. This technique requires a language lab with a two-track tape system and it involves the following steps: (1) read over a written text several times until it is understood, (2) listen to the tape containing the text several times while simultaneously reading the text, (3) record the learners' voice while he/she reads along with the speaker on the tape (the learner should try to "maintain the same speed, rhythm, stress, and intonation" used by the speaker and (4) play back the two recordings and compare them (Celce-Murcia et al., 1996, p. 199).

Providing learners with explicit instruction is especially important in the area of pronunciation. This can be done with the help of the phonetic alphabet and minimal pair activities, as well as with the comparison and contrast of the phonological system of the learners' L1 and that of the L2. Learners need to receive information on how the two languages differ phonologically and about adequate strategies to deal with pronunciation difficulties such as vowel and consonant contrasts, syllabic structures and intonation patterns. Certainly the reference to the learners' L1 is easier when we are teaching a group that shares the same L1. Rivers (1991) highlights the importance of language experience and metalinguistic knowledge, and observes that the interaction between both is essential for language learning to take place.

The classroom implication is that teachers should make sure their learners are constantly using what they already know and reflecting upon what is being learned.

The pronunciation class should also provide learners with a wide variety of listening practice, including naturalistic or naturalistic-like speech samples. Moreover, learners have to listen to their own speech, so that they can develop self-monitoring and self-correction strategies. They can also gain further practice with these strategies by listening to their classmates and providing them with feedback on their pronunciation. Self-listening and peer-listening activities are more effective if accompanied by checklists that help learners focus on specific problems and by selecting phonological points that the teacher feels need to be improved (for examples of checklists, see Prator & Robinett, 1985; Gilbert, 1993, and Celce-Murcia et al., 1996). Equally important is to have learners listen to native speakers' speech and identify linguistic and non-linguistic features that they need to concentrate on, and to provide learners with opportunities to practice their own speech.

Connecting the pronunciation material with the main course book and/or learners' work environment is essential for the success of pronunciation instruction. Wong (1987) recommends that a good way of convincing learners of the importance of working on pronunciation is to make them realize their speech might sometimes be unintelligible. This could be achieved in three ways. First, teachers should *not* understand students when their speech production is likely to be unintelligible outside the classroom. Second, learners should receive assignments in which they are required to communicate with native speakers (and English users of different L1 backgrounds) outside the classroom. Third, learners should tell their partners when they do not understand them. Once learners are aware of the importance of achieving intelligible pronunciation, and hopefully motivated to do so, they are ready for pronunciation classes that aim at intelligibility for effective communication.

The paragraphs above presented some techniques that are expected to help instructors to teach pronunciation for different clienteles, aiming at the development of intelligible pronunciation. Celce-Murcia (1987) and Celce-Murcia et al. (1996) present a framework for pronunciation instruction that incorporates many of these ideas, and, most importantly, provides L2 practitioners with a comprehensive guideline on how to design pronunciation classes and materials.

Celce-Murcia (1987) recommends four steps in designing communicative tasks for pronunciation instruction: (a) Identify your students' problems, (b) find lexical/grammatical contexts with many natural occurrences of the problem sound(s), (c) develop communicative tasks that incorporate the words and or structures, and (d) develop at least three or four tasks so that you can recycle the pronunciation target and keep practicing the target sound(s) in new contexts. Regarding the types of activities and the sequence in which these activities should be presented, Celce-Murcia et al. (1996) propose that a pronunciation lesson should ideally consist of five steps: (a) description and analysis (i.e., awareness raising), (b) listening discrimination, (c) controlled practice and feedback, (d) guided practice with feedback, and (e) communicative practice and feedback. These five steps are illustrated in the pronunciation manual used in the present study (see Appendix E) and the rationale for this framework will be presented in Section 3.6.2 (Chapter 3).

2.3.4 Evaluation

Goodwin, Brinton and Celce-Murcia (1994) discuss another important component of pronunciation instruction—assessment. They suggest three types of assessment: diagnostic evaluation, ongoing evaluation, and classroom achievement testing. Diagnostic evaluation provides an overall picture of learners' command of the L2, helping the teacher identify needs

and make placements. This type of assessment should address perception and production skills. Perception can be assessed via discrimination ability tasks, and production, via the analysis of learners' recorded materials, such as the reading aloud of a passage and spontaneous speech on an open-ended topic.

Ongoing evaluation with feedback should take the form of teacher, peer and self-correction. It allows for evaluation, individualized instruction, curriculum revision and feedback on individual progress. Peer feedback is considered relevant to help learners benefit from classroom interaction, to improve their listening, self-monitoring and self-correction abilities, and to put their knowledge of pronunciation into practice. Activities that can be used for peer practice are pair or group activities where one learner speaks and the others have to discriminate between minimal pairs, or learners can analyze someone's presentation keeping in mind a specific feature (ex. past tense –ed pronunciation). Teachers' correction should use audio or videocassette recorder techniques such as the oral dialogue journal or the recording of pronunciation tutoring sessions.[4] At present, software systems such as *PureVoice*[5] can be used for the same purpose, with the advantage of teachers being able to insert feedback at any point in their students' recordings without taping over the original recording. Whatever type of feedback is given, teachers should remember to provide learners with tools to help them focus on specific pronunciation problems and develop self-monitoring strategies.

Finally, classroom achievement testing assesses learners' mastery of the content provided by the course, thus indicating learners' progress as outlined by the syllabus. The test can be of the same kind used in diagnostic tests, and can include, if possible, many other task types which require some knowledge of the phonetic alphabet (Goodwin et al., 1994).

4 Baptista (1987) offers some important information on how to carry out this type of activity.

5 Free download available at http://www.eudora.com/products

2.4 Pronunciation instruction: Course books and pronunciation textbooks

Researchers have made relevant suggestions concerning the goals, content, procedures and evaluation criteria for pronunciation instruction. Nevertheless, many of these suggestions still need to be incorporated in L2 course books and pronunciation textbooks. In this section, we shall briefly analyze some of the books used in English courses at private institutions and at universities in Brazil, focusing on the instruction of the pronunciation component.

Some popular course book series used for English instruction in Brazil[6] are *Headway* (Soars & Soars, 1987), *Interchange* (Richards, Hull & Proctor, 1990) and its new version - *New Interchange*, (1997), *American Dimensions* (O'Neill, Mugglestone & Anger, 1992) and *Passages* (Richards & Sandy, 2000). In addition to these textbooks, some language courses at universities use special pronunciation textbooks. These are the rare cases when the pronunciation component is likely to be the content of a whole semester course. At *Universidade Federal de Santa Catarina*, some of the pronunciation textbooks used are: *Manual of American Pronunciation* (Prator & Robinett, 1985), *Focus on Pronunciation* and *Basics in Pronunciation* (Lane, 1993 and 1997, respectively), *Clear Speech* (Gilbert, 1993 and 2001) *Pronunciation Tasks* (Hewings, 1993), and *Sound Advantage* (Hagen & Grogan, 1992). I shall begin by analyzing the course books, and then concentrate on the pronunciation textbooks.

2.4.1 English course books

Of the four course book series analyzed, the only one that completely disregards the pronunciation component is *Passages*. The other series vary in the extent to which they

6 The textbooks chosen for analysis are used in the English undergraduate program and extracurricular courses at UFSC, other universities, and private institutions in Brazil.

explore pronunciation, as well as in the procedures used. From the *Headway* series, the intermediate book does not contain any pronunciation practice in itself, but an additional pronunciation manual was designed by Bowler and Cunningham (1990) to accompany it. The other two books, upper-intermediate and advanced, contain one or two pronunciation exercises in four out of 12 units. Furthermore, *Headway*'s advanced workbook includes one or two pronunciation exercises for each of the 12 units. An analysis of books 1, 2 and 3 of the series *Interchange*/ *New Interchange* reveals that the pronunciation component is present in almost all units; but the laboratory manuals (Richards, 2002) leave out the pronunciation component. The two volumes of the *American Dimensions* series (intermediate and advanced) contain very short exercises that offer extra information about the pronunciation of vocabulary and grammar items that appear in the same unit as the pronunciation task.

As regards pronunciation content, the textbooks analyzed deal mainly with the instruction of intonation, stress, consonant and vowel contrasts, and inflectional endings (past tense –ed and 3rd person singular present tense and plural endings). Two of the textbook series -*Headway* and *American Dimensions* - contain exercises involving the relation between spelling and sound, and in *American Dimension*s and *Headway Advanced* (both the student book and the workbook), the spelling/sound relation is the focus of many exercises. For example, a typical spelling-sound exercise deals with the pronunciation of words with irregular spelling ("tough", "enough") or silent letters ("knife", "plumb"). The two series also emphasize the way affixes and parts of speech can cause stress alternation (e.g., "photograph" and photography"; "present" (noun) and "present" (verb), respectively). The manual that accompanies *Headway Intermediate*, in addition to offering pronunciation practice, recycles the content of the textbook. This is because the pronunciation activities deal with grammar points, vocabulary and topics found in the same sequence in the

textbook. The *Interchange*/*New Interchange* series presents short exercises that deal mainly with intonation, various reductions, linking, consonant release, and emphatic and contrastive stress at the word and sentence levels.

Regarding procedures for pronunciation instruction, *Headway Intermediate* and U*pper-intermediate* contain the typical listen and repeat exercises and minimal-pair contrasts, at the word and sentence levels. On the other hand, *Headway* A*dvanced* (the student book and the workbook) relies mostly on the reading aloud of poems, based on a listening model, as well as on exercises involving classifying and matching. Most of the exercises assume that the students are already acquainted with the pronunciation rules being targeted. The pronunciation manual that accompanies *Headway Intermediate*, however, is more comprehensive in terms of procedures. It contains illustrations showing lip and tongue position for the articulation of the sounds and it highlights when sound contrasts are a problem for learners of a specific L1. Nevertheless, the exercises are not designed to suit all learners with different L1 backgrounds, since the way sounds are contrasted is not always relevant for some L1 learners mentioned by the authors[7]. Additional techniques used for pronunciation practice are (a) listening discrimination, (b) listen and repeat, (c) rule deduction, and (d) controlled practice. The pronunciation component seems to be important to the authors of *Headway*. Although the textbooks vary in the quantity of pronunciation tasks and the exercises tend to be limited to the linguistic aspects of pronunciation, the authors try to keep the pronunciation tasks connected with the content of the unit in which they appear.

In the *Interchange*/*New Interchange* series (Richards et al., 1990, 1997), the pronunciation activities are generally very short and simple, consisting of presentation through a model, listening

7 For example, the sounds /j/ and /dʒ/ are presented as being a problem for Portuguese learners, but actually, for Brazilian Portuguese learners, the problematic contrasts are /ʒ/ and /dʒ/, and /d/ and /dʒ/ before /i/.

discrimination, identification, repetition, and a few exercises requiring learners' elaboration of examples based on the model. Most of these procedures are recurrent in this four-book series (from elementary to intermediate level), and what varies is the grammar of the sentences and the vocabulary being practiced, which are directly connected to the unit where the pronunciation task appears.

In *American Dimensions*, the pronunciation content is reviewed after every two units, together with the grammar and vocabulary review. There is no explicit instruction about the pronunciation item, and generally learners have to perform a discrimination task in order to guess the rule that governs the target pronunciation item. This task generally contains minimal pairs or lists of words in which one sound differs from the others, and it is normally followed by another task in which learners are required to repeat after a model or read aloud words, sentences or short dialogues. Similar to *Headway* and *Interchange*/*New Interchange*, *American Dimensions* approaches the pronunciation component with a focus on the linguistic aspects, neglecting communicative practice through activities that require more spontaneous speech, such as interviews, role-plays or shadowing.

2.4.2 Pronunciation textbooks

As for the pronunciation textbooks, most of them are directed at intermediate or advanced learners (e.g., Prator & Robinett, 1985; Hagen & Grogan, 1992; and Gilbert, 1993; Lane, 1993 and 1997, Orion, 1988). Hewings' (1993) textbook is the only one directed at pre-intermediate learners, and more recently, Gilbert (2001) released a book directed at beginning learners. These textbooks tend to include exercises with vowels, consonants, intonation, stress, rhythm, syllables, and connected speech features (e.g., reductions, assimilation, linking). The following review will concentrate on how the pronunciation textbooks deal

with the two components that are the scope of the present study: consonants and syllables.

Manual of American Pronunciation (Prator & Robinett, 1985) is directed at advanced learners. Actually, the book contains so much detailed information about the English sound system that, as suggested by the authors, it is suitable for learners studying to be language teachers. The units start with detailed phonetic descriptions of segmentals and suprasegmentals, and there are many exercises that require learners to use phonetic transcriptions. The syllable component is discussed in the units dealing with rhythm and stress, with an emphasis on the contrast stressed/unstressed at word and sentence level. The consonants are introduced toward the middle of the book, with an emphasis on voicing, place and manner of articulation. There is also a thorough description of all types of consonant clusters and some information about the difficulties they may offer. The book contains an impressive inventory of English pronunciation features that the authors believe to be the most relevant to help improve L2 learners' pronunciation. According to the authors, the content selection was based on previous analysis of speech samples of learners of different L1 backgrounds.

Regarding procedures, *Manual of American Pronunciation* contains illustrations to help learners articulate the sounds properly, as well as plenty of listen and repeat tasks. The pronunciation items are recycled throughout the units with exercises that involve perception and production at the word, sentence, and paragraph levels. Learners are also required to read aloud or record texts, conversations and limericks, and the sounds are practiced in initial, medial and final positions. The manual's value lies in its careful compilation of pronunciation difficulties and the comprehensive phonetic descriptions. The exercises, however, lack a communicative focus. Most units follow a sequence that includes: (a) detailed description of the pronunciation focus, (b) listening discrimination via a native

speaker's model, (c) listen and repeat, and (d) reading aloud or answering questions.

In *Pronunciation Tasks* (Hewings, 1983), the consonants are presented in separate groups according to the manner of articulation (e.g., plosive, fricatives). Subsequent units offer additional practice with the consonants again, but now grouped in pairs (e.g., /p/~/b/). This manual includes practice with some consonant clusters—initial, medial, final, and across words. The units dealing with clusters also discuss the processes of deletion and linking. The normal procedure throughout the units is to have learners (a) listen to and repeat words containing the target sounds, (b) complete a discrimination task (underline words containing the target sounds in a conversation, sentence or word, or classify words according to a specific target sound), (c) listen to and repeat a list of words that are used subsequently to complete short conversations or sentences, and (d) read conversations. Sometimes learners are asked to deduce rules or give short answers using some vocabulary previously practiced. The units dealing with consonants also contain illustrations showing how they are articulated. Some interesting features of Hewings' book are the variety of task types, the selection of vocabulary that is appropriate to the learners' level, and vocabulary recycling. However, sometimes the tasks that ask for rule deduction appear as the first step in a unit, and this might hinder motivation due to the level of difficulty of some of the tasks. Furthermore, some units lack a smooth transition between content presentation and more open-ended tasks, and many units finish with controlled or guided practice.

Gilbert's *Clear Speech* (1993) for intermediate/advanced learners starts with a comprehensive test to help teachers build a pronunciation profile of their learners. In the beginners' book, Gilbert (2001) initially focuses on the alphabet and vowels. In both books, Gilbert presents some of the pronunciation items in a rather different way from other material writers, which is connected to her belief that work on rhythm can be the most

effective way of improving learners' pronunciation. The concept of syllable counting is addressed in the initial units of both books. In the intermediate/advanced book, syllable counting is practiced at the word and sentence levels, also including information on past tense endings and letters that are not pronounced. On the other hand, in the beginners' book, the focus is at the word level only, and the emphasis is on word-endings, especially the contrast between words ending in a consonant versus a consonant plus –y (e.g., contrast such as *rain*/*rainy*), past tense or gerund endings. In the advanced book, from units 2-7, the focus is on consonants, which are presented in pairs, while in the beginners' book, the consonants appear in the second half of the book. While most pronunciation textbooks use the voicing or place of articulation criteria to contrast the consonants, *Clear Speech* relies on the manner of articulation criterion (e.g., continuants versus stops). Thus consonants that have the same place of articulation but different manner of articulation (e.g., two alveolars, such as the fricative /s/ and the stop /t/) are paired. In some units and an appendix, there is practice with contrasts that might be difficult for learners of some L1 backgrounds (e.g., /t/~/θ/).

As for procedures, in *Clear Speech*, most contrastive pairs of consonants are accompanied by lip and tongue illustrations of how they are articulated, together with some tips to practice producing the two sounds. During the practice, in the intermediate/advanced book learners alternate between the two sounds in isolation and in words containing them in final position, beginning with silent practice and then saying them out loud. The practice goes on with minimal pairs (both at the word and sentence levels), concentrating on the target sounds in final position. After receiving information and practicing linking, the learners get additional practice. In the intermediate/advanced book, the practice involves repeating limericks, songs, or rhymes in order to improve rhythm, while in the beginners' book, it involves performing short dialogs with a communicative function (e.g., checking phone numbers). Finally,

in the advanced book, learners' perception is checked with the help of sentence dictation, and there is a brief review of the previous unit's instruction point, whereas in the beginners' book, the perception exercises involve discrimination with minimal pairs. In addition to these activities, the units dealing with consonants also contain extensive practice of minimal pair sentences with peer feedback and dialogue reading, but communicative tasks are rare. Different from many manuals is Gilbert's focus on the perception and production of consonants in final position, which is particularly important for learners whose L1 sound inventory has a limited number of consonants occupying final position (e.g., Brazilian Portuguese). Choosing to contrast consonants in terms of manner of articulation has its negative and positive points. On the one hand, it enlarges the contrast between the two sounds being studied, thus making it easier for learners to hear and produce the contrast. On the other hand, it disregards major difficulties such as that posed by the voiced/voiceless contrast, which is a relevant feature of English pronunciation that learners of certain L1 backgrounds may find difficult to acquire without explicit instruction (e.g., German speakers).

Focus on Pronunciation (advanced) and *Basics in Pronunciation* (intermediate) (Lane, 1993 and 2001, respectively) present an overview of the consonants in the initial units, but this component is addressed more thoroughly in the second half of the books. In *Focus on Pronunciation*, there is further practice with the consonants in supplementary units towards the end of the book. Both books include information about initial and final consonants, and the contrast between voiced and voiceless consonants is emphasized, as well as linking with final consonants. Another issue addressed by both books is the pronunciation of initial and final clusters, as well as past tense, plural, and third person endings. In *Basics in Pronunciation*, syllable counting and stress are the focus of initial units, but in the advanced book, only syllable stress is emphasized, giving special attention to the

way prefixes and suffixes can change word stress, as well as the stress patterns of compound nouns.

Regarding procedures, *Focus on Pronunciation* and *Basics in Pronunciation* are slightly heavy on the description of the phonological features, and they present tips and illustrations to help learners produce the target sounds. These are generally followed by exercises in which the learners have to listen and repeat or discriminate sounds. There are also a few exercises in which tips for rule memorization are given (e.g., the pronunciations of past tense endings), several exercises involving listening to recorded texts and answering questions, and dialogue practice. Furthermore, towards the end of the units, there are several exercises in which the learners are required to ask and answer questions based on a set of given vocabulary containing target sounds, which is generally performed in the form of a game. The assignments involve recording words and expressions studied in each unit, as well as spontaneous speech samples such as reporting an experience or describing an event.

Sound Advantage (Hagen & Grogan, 1992) addresses the syllable in initial units, drawing learners' attention to how it is defined and counted, including information about stress, pitch patterns, the relationship between vowel length and syllable stress (here special attention is given to the reduced vowel /ə/). Most units begin with a pre-test involving a listening discrimination task, which is followed by a chart with examples and information about the target instruction point. The following tasks normally involve listening for a model, followed by repetition exercises. Some perception exercises require learners to listen to words which are not spelled and to decide whether they have a certain sound or are the same or different. For isolated sounds, there is the help of illustrations and directions to guide their correct articulation. The production exercises normally include practice at the word, phrase, and sentence levels. In the chapter on consonants, the authors also address the notion of unreleased

consonants and the difficulties posed by clusters, drawing attention to the way some language learners use an epenthetic vowel or delete consonants while producing difficult clusters. In the appendices, there are additional activities with all of the consonants, which are practiced by reading minimal pairs or short sentences, accompanied by information about the consonants' articulation. Here the consonants are practiced in initial, medial, and final positions. In addition, *Sound Advantage* includes tasks that ask for listening discrimination of words that are not spelled, which might prevent learners from being dependent on spelling.

Two negative points in *Sound Advantage* are that the initial units lack exercises that go beyond controlled practice, and the sequence of exercises in the units on vowels tends to be quite repetitive. These two factors make it hard to keep learners motivated[8]. The last seven units contain more open-ended tasks, giving the learners the opportunity to speak more freely, as well as to monitor their pronunciation performance in more communicative tasks. Most of these tasks include paragraph reading, short presentations dealing with cultural aspects, picture description, pair/native speaker interviews, and sentence completion. A limitation in this textbook is that there is no smooth transition from controlled to open-ended tasks and, although students are expected to work in pairs or groups to provide peer-feedback, the manual offers no directions on how they should do it.

2.5 Conclusion

The review of general language textbooks for English as an L2 indicates that there is a lot to be done to develop materials that approach pronunciation with a focus on communication and intelligibility. Some pronunciation textbooks have tried to include

8 This was the feedback I received from a group with whom I used Hagen and Grogan's (1992) manual to teach pronunciation.

and sometimes integrate a wide range of information on segments and suprasegmentals. Despite this effort to include a large number of pronunciation items, these textbooks still fail to provide activities that range from more controlled to more communicative. All in all, this brief examination of textbooks indicates that the pronunciation activities mostly focus on steps (b) and (c) of the pronunciation teaching framework proposed by Celce-Murcia et al. (1996). In other words, most activities focus on listening discrimination and controlled practice and feedback. Few textbooks address step (a), description and analysis by calling learners' attention to sound and spelling correspondence and/or illustrating the articulation of vowel and consonant sounds. A similar conclusion is drawn by Jones (1997), after a review of several available pronunciation materials. This reinforces the assumption that followers of the Communicative Approach are still struggling to cope with the pronunciation component adequately.

3. Issues in Second Language Acquisition: focus on the acquisition of the phonological system

3.1 Introduction

The field of Second Language Acquisition (SLA) has developed considerably over the past fifty years, giving rise to several lines of research that try to explain the process human beings undergo when acquiring a second language. Some of the issues[1] that have been investigated in an attempt to build a model for SLA are the role of the following elements: (a) L1; (b) Universal Grammar (UG); (c) age; (d) similarity, dissimilarity, and markedness; and (e) formal instruction.

This section will address some of the answers given to these questions and will present a brief review of the most influential findings regarding the process of SLA, including linguistic, cognitive, and biological factors.

1 Different questions have been raised in studies concerned with non-linguistic factors. For example, some studies have investigated the role learners' characteristics such as motivation, personality, aptitude and social factors play in SLA (e.g., Gardner & Lambert, 1972; Jones, 1977. Schumann, 1978; Meisel, Clahsen & Pienemann, 1981; Beebe, 1983; Skehan, 1989). As the present study does not seek to investigate such issues in depth, the answers provided to these questions in SLA literature will not be reviewed here.

3.2 The role of the L1

The question of whether the L1 plays a role in SLA has been the source of extensive controversy. During the 50s and 60s, the Contrastive Analysis Hypothesis (CAH) proposed that L1 transfer was the key to understanding SLA (Fries, 1945, Lado, 1957). As observed by Ritchie and Bhatia (1996), this hypothesis reflects psychological and linguistic theories structured upon a behaviorist view of language acquisition. Thus, the CAH predicted that SLA is only possible when learners manage to transfer the habits of their L1 into the L2. More specifically, the CAH predicted that SLA is easier when the L2 and the L1 have similar structures, but difficult when the structures of the two languages differ. For example, both Brazilian Portuguese and English have words beginning and ending with the letter "m". In both languages, "m" is pronounced as [m] in syllable-initial position. However, in word-final position, "m" is pronounced as [m] in English, but not in Brazilian Portuguese, where it is pronounced as a nasal diphthong: *bom* "good" [bõw] (Vandressen, 1999). Due to this difference, the structure of the L1 would interfere and Brazilian learners would have difficulties in mastering the English final /m/, since they would have to cope with the burden of suppressing L1 habits and developing new habits to suit the L2. The same would happen to English speakers learning Brazilian Portuguese.

The CAH has been criticized for overstressing the role of the L1 in the process of acquiring an L2, since not every error encountered in the language produced by L2 learners can be attributed to their L1. For example, Brazilian learners tend to have difficulties with the stress pattern of the word *hotel* and they may stress the first syllable instead of the last one [howtɛw]. In BP, the stress pattern for this word is exactly the same as in English, thus we would not expect learners to have problems with this word. Possibly, this error is caused by the overgeneralization of a rule that says that most disyllabic nouns in English are stressed on the first syllable.

Due to the limitations of the CAH, some lines of research tended to try and abolish the notion of L1 transfer in SLA. This is the case of the Morpheme Order Studies, which were carried out to provide empirical support for the hypothesis that children exposed to either the L1 or the L2 under different conditions tend to undergo similar developmental stages. In the field of SLA, the Morpheme Studies were initially carried out by Dulay and Burt (1972). These researchers rejected the notion of L1 transfer, which was considered an irrelevant factor in SLA. Several studies were carried out to confirm the hypothesis that the processes involved in SLA are pretty much the same as those in L1 (L1=L2 hypothesis). Support for this hypothesis came mainly from studies that dealt with the acquisition of morphemes (e.g., plural forms, present progressive) by Spanish-speaking children acquiring English. These studies showed that many L2 learners seemed to basically follow the same morpheme acquisitional order, independent of their L1 background.

The Morpheme Studies have been criticized for their limitations, especially in relation to their data elicitation devices, the lack of attention to individual differences, and the complete denial of L1 influence (Gass & Selinker, 1991; Towel & Hawkins, 1994). Nevertheless, the Morpheme Studies were the driving force behind an important trend in SLA research, which had traditionally compared L1 and L2 while investigating the acquisition process. In its new phase, SLA acquisition research started to focus on the language produced by learners in order to identify acquisition patterns. This new tendency was developed even further with the rise of Error Analysis (Corder, 1971), which was also seeking support for the L1=L2 hypothesis. Learners' language samples were exhaustively analyzed in order to identify errors and their sources. The results also confirmed that the learners' L1 failed to account for every error, since learners of different L1 backgrounds made similar errors in a given L2. An additional finding was that the criterion similarity/

difference of structures was not a good predictor of difficulty. These findings certainly undermined the central tenets of the Contrastive Analysis, but Error Analysis has also received its share of criticism for focusing on errors and for creating endless and ambiguous lists of types of errors.

The findings of the Morpheme Studies and Error Analysis were essential to the recognition of the dynamism and autonomy of the L2 system, leading to the investigation of this system as whole, not only the cases in which acquisition seemed to be difficult or unsuccessful. Nevertheless, the complete rejection of the learners' L1 as a relevant factor in SLA proved to be inadequate, and this will be illustrated with examples from interphonology studies in this chapter. A more acceptable view of the role played by the L1 in SLA is offered by Selinker (1972), who coined the expression *interlanguage* (IL) to define the L2 learner's language system, which is seen as a system composed of L1 transfer, L2 structures and overgeneralization of language rules. According to Selinker (1972), an important feature of IL is that it is subject to *fossilization*. In other words, the IL contains structures that (a) fall short of the target language; (b) are impervious to L2 exposure, explicit instruction or negative feedback; and (c) remain as potential performance, especially when learners are engaged in intellectually demanding activities or experience anxiety, excitement or relaxation.

Based on what has been reviewed in this section, it seems pertinent to conclude that the L1 does play an important role in SLA, and it cannot be ignored when one interprets data in this field. However, one cannot overstress this role and resort to L1 transfer to explain all sorts of difficulty that learners encounter in the SLA process.

3.3 The role of UG

The finding that the L1 is not the only factor affecting SLA redirected the focus of research, which has sought alternative explanations for the process of SLA. A very influential line of research in the area of language acquisition is the Universal Grammar (UG) approach, as proposed by Chomsky (1981, 1986). This is a general theory of language acquisition, and as such, it should be appropriate to guide studies in the field of SLA as well. Some followers of the Generative Approach (second generation) defend that all human beings inherit a set of principles and parameters, which are the basis for language acquisition. The principles are universal features in all languages of the world, which means they remain the same across languages; for example, all languages contain vowels and consonants. On the other hand, each language uses a different set of parameters, which are limited, usually binary (yes or no) sets of options from which the speaker of a certain language can choose, based on their input in language acquisition. For example, some languages might contain a number of syllable types such as (C)(C)V(C)(C) (e.g., Portuguese), while others might allow mostly CV syllables (e.g., Japanese[2]).

The hypothesis that all human beings are endowed with a language learning mechanism (i.e., UG) might account for the logical problem of language acquisition. In other words, the existence of this mechanism might explain how children acquire such abstract knowledge as language, despite exposure to limited and degenerate language input, and the lack or ineffectiveness of negative feedback (Chomsky, 1986).

The logical problem of language acquisition applies to both L1 and L2, but in the second case, other issues are involved. Different from L1 learners, most L2 learners fail to achieve

2 Japanese also allows CVC syllables, but only a nasal consonant can occupy the coda position Avery & Ehrlich, 2002, p. 136).

full mastery of the L2, especially when they start learning the language after puberty. Therefore, one can question to what extent the proposed language learning mechanism can account for SLA.

The debate regarding the role of UG and why incompleteness seems to be the rule in SLA has culminated in three different positions. The first position argues that adult L2 learners have no access to UG and that this is due to age constraints (e.g., Meisel, 1991). The second position states that L2 learners can only access UG via their L1, which might explain why they have difficulties in resetting the existent L1 parameters to fit the L2 (e.g., Bley-Vroman, 1983; Schachter, 1989). According to Bley-Vroman, UG atrophies with age, thus forcing L2 learners to rely on problem-solving mechanisms. Therefore, L2 learners' different achievement levels depend on how good they are at problem-solving. Finally, the third position holds that L2 learners have partial access to UG; therefore, only some parameters are available in SLA, and those parameters that are unavailable are replaced with L1 parameters (e.g. White, 1992).

None of the three positions mentioned in the previous paragraph has satisfactorily explained the role played by UG in SLA. The present study is in agreement with the view defended by Gass (1996), who points out that empirical research has indicated that UG plays an important role in SLA, but that this mechanism, as well as the SLA process, is greatly influenced by the learners' L1 background. The challenge, then, is to explain why certain structures are more subject to L1 transfer than others.

3.4 The role of age

Although linguistic factors have been extensively studied, we still lack a solid explanation about why SLA, contrary to L1 acquisition, is generally incomplete. Alternative explanations outside the realm of the linguistic tradition have been offered,

among which are the effects of social and psychological factors, and age (Gass & Selinker, 2001).

Whether age constrains SLA as a whole is still a controversial issue. However, many researchers seem to agree that the age factor is relevant in the acquisition of the L2 phonological system and that it accounts for accented pronunciation (e.g. Scovel, 1988; Long, 1990; Gass & Selinker, 2001). Research in this area has pointed to four different directions.

The first position proposes the existence of a critical period for SLA, predicting that most adults would be unable to acquire native-like proficiency in an L2 due to biological constraints. This inability might be due to *lateralization*, i.e., the assignment of specific abilities to either the right or left brain hemisphere (e.g., Lenneberg, 1967, Selinker, 1971). Although some researchers propose that lateralization limits the acquisition of the entire L2 phonological system (e.g., Oyama, 1976), others believe that the effects of the critical period in SLA are restricted to the articulatory and prosodic levels (e.g, Scovel, 1969). This position, whether generalized or limited to the phonological level, is known as the strong version of the Critical Period Hypothesis (CPH).

The second position is the Developmental Null Hypothesis. Its main claim is that L2 and L1 abilities are the same, and that the ability to learn a language does not change with age, but remains equally accessible to every learner (e.g., Neufeuld, 1977; Hansen, 1995; Bialystok & Hakuta, 1999). The fact that most learners fail to access this ability in full when learning an L2 is attributed to the influence of social and psychological factors. A similar position is held by several researchers who oppose the CPH on the grounds of insufficient and inadequate empirical support, and the case of learners who manage to achieve a native-like pronunciation of the target language despite starting to learn it after puberty. Thus, the third view of the role played by age in SLA proposes that age is an important factor, but it cannot be regarded as completely limiting the acquisition of L2 pronunciation. This third view is

reflected in Jacobs' (1988) proposal, which states that individuals may have access to the language acquisition system throughout life. The fact that most language learners fail to access this system is a consequence of the interaction between biological, individual, psychological and social constraints.

Finally, a weak version of the CPH constitutes the fourth view of the role played by age in SLA. This position recognizes that not every adult is subject to the biological constraints that limit SLA. Not only does this hypothesis accept that some adults can maintain their language learning abilities intact, but it also makes a claim for a need for theoretical explanation for the exceptional cases of adults who achieve native-like proficiency (e.g., Seliger, 1972; Bongaerts, van Summeren, Planken & Schills, 1997; Flege, 1999).

Flege (1995) rejects the notion of a critical period for SLA, and Flege (1999) suggests that the main cause of accented speech is the fact that learners perceive L2 sounds based on the L1 phonological inventory; thus, the more developed the L1 system, the greater its influence on SLA. As the older the learner the more developed his/her L1 is, the probability of having a more accented L2 pronunciation increases with age. Moreover, Bongaerts (1999) suggests that the achievement of native-like pronunciation by some of the learners he investigated might have been caused by high motivation, continuing L2 input, and explicit instruction.

3.5 The role of similarity/dissimilarity and markedness

Some researchers have proposed that the triggering of L1 interference and UG developmental processes in SLA might be due to similarity/dissimilarity criteria. Major (1987, 2001) proposes that sounds that are similar in the L1 and the L2 are more difficult to acquire than sounds that are dissimilar. This is due to the fact that similar sounds favor L1 transfer and this makes

it difficult for learners to develop new categories for similar sounds. On the other hand, dissimilar sounds are not subject to L1 transfer, but rather to developmental processes based on the UG, which are very similar to those found in L1 acquisition. Therefore, learners are more likely to develop new categories for the dissimilar sounds and, eventually, achieve native-like command of these sounds. As for similar sounds, learners tend to rely on L1 equivalents and fail to develop a new category that completely matches the L2.

Support for Major's (1987) proposal is provided by his study on Brazilian learners acquiring English /ɛ/ and /æ/. Major found that beginning-learners frequently substituted the Portuguese /ɛ/ for both the English /ɛ/ (similar sound) and /æ/ (new sound). More proficient learners, however, produced /æ/ more accurately than /ɛ/, thus indicating the development of a new category for /æ/, but not for the similar sound /ɛ/. A similar result was obtained by Flege and Hillembrand (1984) in a study investigating the acquisition of French /u/ and /y/ by Americans. Baptista (1992) provides additional support for Major's proposal. In her study of Brazilians acquiring English vowels, Baptista found that learners start with the L1 vowel system, but that eventually they tend to acquire the new L2 sounds[3]. In fact, initially they already had the vowel /ʌ/ (new sound), not confused with any other vowels, but this vowel was not as low as the native English vowel.

The crucial point in Major's proposal is defining the concept of similarity. As he observes, we can employ different criteria to identify a particular sound as being similar or not. Major (2001) mentions perception, acoustics, articulation, native/non-native speaker intuitions, and most importantly, the learners' mind criterion. Learners might assume that dissimilar sounds are

3 An important finding in this study is that the vowels are acquired as a system, i.e., learners do not acquire vowels individually or in contrastive pairs, but have to make adjustments in their initial vowel inventories as a whole in order to acquire the new vowels.

similar due to orthography, or the existence of L1 phonological processes. For example, initially, Brazilian learners tend to assume that the sound /θ/ is similar to /t/, /s/ or /f/ (Xavier, 1989). Then, they learn that /θ/ is a completely different sound, and eventually they might learn how to articulate it.

The interaction between L1 transfer and UG developmental processes is also exemplified in the acquisition of the English sound /t/ by Brazilian learners. This sound has a similar counterpart in Portuguese, which is generally pronounced as an alveolar or dental stop /t/ (Cristófaro-Silva, 1999). Thus, Brazilian learners tend to assume that this sound is the same in both the L1 and the L2 and are likely to continue using the L1 equivalent, without realizing that the sound is slightly different in English (an alveolar stop), especially in the contexts of stressed syllable-initial position, where it is aspirated. On the other hand, the sound /t/ appears in word-final position in English, but not in Brazilian Portuguese. Therefore, when learners pronounce this sound in word-final position they might resort to syllable simplification strategies. Frequently, Brazilians insert a vowel [i] to produce /t/ in word-final position in English, which is a strategy they also resort to when faced with syllable-final obstruents in Portuguese (for example, with acronyms *PET* [ˈpɛti] or loan words *set* [ˈsɛti]). However, these learners occasionally devoice the phoneme /d/, which is a common syllable simplification strategy found in other languages that have word-final obstruents (Baptista & Silva Filho, 1997).

The previous example can be used to support Flege's (1987) concept of *equivalence classification*. According to Flege, learners interpret the L2 sounds based on the phonetic inventory of their L1. Therefore, as the L1 system is the basis for the acquisition of the L2 sounds, learners will approximate, but rarely achieve the L2 target. Note that the concept of equivalence classification assumes that learners tend to interpret most L2 sounds as being somehow similar to the L1. This means that the criterion *learner's*

mind is the only one that really matters to evaluate whether an L2 sound is similar to the L1 or not.

In addition to similarity/dissimilarity, *markedness* has been proposed as a relevant criterion to account for whether a structure is prone to L1 transfer or UG developmental processes. Eckman (1996, p. 198) explains markedness as follows:

> If the presence of a structure *p* in a language implies the presence of some other structure *q*, but the presence of *q* in some language does not imply the presence of *p*, then *p* is marked relative to q, and structure *q* is unmarked relative to structure *p*.

Eckman (1996) proposes the Markedness Differential Hypothesis (MDH), which states that: (a) The degree of difficulty of linguistic structures depends on their markedness, and (b) markedness is a relevant criterion when structures differ between the L1 and the L2.

To illustrate the MDH, let us consider consonant clusters, where three-member clusters (e.g., /str/) represent structure *p*, and two-member clusters (e.g., /tr/, /st/) represent structure *q*. If a language contains three-member clusters, it must contain two-member clusters; however, a language might contain only two-member clusters, and this does not imply that the language contains tree-member clusters (Greenberg, 1978). This hypothesis is confirmed by languages such as English, which contains /str/, /st/, and /tr/. Brazilian Portuguese, however, only contains /tr/. Therefore, following the MDH, we can state that three-member clusters are more marked than two-member clusters. Thus, Brazilian learners are expected to have more difficulty acquiring the English three-member clusters than the two-member clusters. Furthermore, these learners are expected to have more problems acquiring /st/ than /tr/, because the former is not permitted in the phonological system of their L1, and it is also marked concerning sonority sequencing (see details in Chapter 4).

Researchers have investigated the predictions made by the MDH. Eckman (1991) found that markedness could partially account for the acquisition of consonant clusters by Japanese, Korean, and Cantonese learners of English. However, this study also showed that L1 transfer can be more powerful than markedness. Rebello (1997) obtained similar results regarding the acquisition of English word-final consonants and initial /s/ clusters by Brazilians. Rebello found that the two-member clusters /sl/, /sm/, and /sn/ tend to be more difficult for Brazilians than other two-member clusters. These two-member clusters are subject to the transfer of an L1 phonological process, namely, voicing of /s/ when this segment is followed by /l/, /m/, or /n/ (e.g., "slow" [iz̲'low]). This fact seems to cause learners to insert an epenthetic vowel more frequently when pronouncing these two-member /s/ clusters than the three-member clusters because voiced clusters are more marked than voiceless clusters.

A further challenge to the MDH is to explain why L2 learners may have difficulties with structures that are similar in the L1 and the L2 (for example, findings such as Major's, 1987) regarding the acquisition of the English /ɛ/ and /æ/ by Brazilian learners, discussed in the second paragraph of this section. First, these findings contradict the assumption that more marked sounds (/æ/) are more difficult to acquire than less marked sounds (/ɛ/)[4]. Second, it shows that even similar, unmarked sounds can be difficult to acquire.

Eckman (1996) tried to solve this problem by proposing the Structural Conformity Hypothesis (SCH). This hypothesis maintains the assumption made by the MDH regarding the importance of markedness, but it abandons the notion of difficulty based on L1 and L2 differences. According to the SCH, markedness applies equally to L1 and interlanguage, and whether a particular L2 structure is different from the L1 is irrelevant, since markedness

4 The vowel /æ/ is less frequent in the languages of the world than /ɛ/, which makes the former more marked than the latter.

and degrees of difficulty for particular structures are based on the status these structures have in the languages of the world. In other words, the concept of typological universals is the basis to determine markedness and degree of difficulty; more specifically, those generalizations that apply to L1s also apply to interlanguages.

Eckman's (1991) study on the acquisition of English word-initial and word-final clusters by Japanese, Korean, and Chinese learners indicates that the participants' interlanguages abided by the predictions made by typological universals (Greenberg, 1978). The participants who produced three-member clusters (e.g., /str/) also produced both or at least one of the component two-member clusters (/st/ and /tr/). The violation of typological universals occurred in the case of clusters with liquids. Greenberg (1978) proposes that clusters containing nasals are more marked than clusters with liquids; thus, the former should be more difficult to acquire than the latter. However, Eckman's results showed that clusters with liquids were more difficult than clusters with nasals for some subjects, owing to L1 transfer.

In summary, the notion of markedness has become extremely important to SLA. However, the predictions made by either the MDH or the SCH have been challenged and further studies are necessary to clarify their status. These hypotheses imply that the less marked phenomena are acquired before more marked phenomena. As shown in previous studies on vowel acquisition (Major, 1987, and Baptista, 1992) and initial /s/ clusters (Rebello, 1997), this is not always the case.

3.6 The role of instruction

Intuitively, language teachers accept the assumption that instruction affects SLA, but this assumption has been frequently challenged by empirical research. The main criticisms have been that the knowledge resulting from instruction lacks long-

lasting effects and is inaccessible for spontaneous speech (e.g., Ellis, 1985; Felix & Weigl, 1991; White, 1992; Trahey & White, 1993). This skepticism towards instruction as a means of facilitating SLA has also been reflected in certain approaches to Second Language Teaching (see Chapter 2). This section reviews important theoretical and empirical studies concerned with the role played by instruction in SLA, with an emphasis on empirical studies testing the effects of pronunciation instruction.

3.6.1 Acquisition and Learning

Krashen (1981, 1983, 1985) includes instruction as one of the components of his model for SLA. The author makes a distinction between acquiring and learning a language. Acquisition is subconscious and identical to the way a child learns language. While acquiring an L2, learners are not consciously aware of the grammatical rules of the language, but simply aim at being able to communicate. The source for acquisition is natural contacts with the language (e.g. interacting with native speakers). On the other hand, learning is a conscious process, since it involves gaining knowledge about a language, resulting in learned linguistic knowledge, which comprises the learned system. This system is internalized separately, and is used for monitoring the language produced by the acquired system. The source for learning is formal contacts with the language (e.g., classroom setting). An important aspect of Krashen's model is the strict separation of acquisition and learning, since, as the author emphasizes, one cannot turn into the other.

Similar to Krashen, Schwartz (1993) proposes the existence of two types of knowledge: competence, which gives rise to performance, and learned linguistic knowledge, which gives rise to learned linguistic behavior. Schwartz believes that competence can only be acquired through exposure to positive data[5], which

5 Evidence that a certain structure occurs in a language.

will enable the learner to trigger existing parameters. Learned linguistic knowledge results from exposure to instruction or negative data[6]. This knowledge does not influence the acquisition of competence, but it can give rise to "automatized behavior" (learned linguistic behavior), which can be confounded with competence, but that, different from competence, is developed via general cognitive abilities, not via the language module.

Both Krashen and Schwartz propose that acquisition (competence) and learning (learned linguistic knowledge) are two different systems, and that one does not turn into the other. If this is the case, we still have to answer two questions. First, it is necessary to account for those post-puberty learners who manage to achieve a good level of proficiency, despite learning the L2 in a classroom setting only. Second, we need to explain why post-puberty learners who are immersed in an L2 setting hardly ever manage to achieve native-like proficiency, despite extensive exposure to positive data.

Krashen suggests that the existence of an affective filter could account for learners with exceptional performance, as well as learners who strive to become fluent in the L2. On the other hand, Schwartz offers a compelling account for the native-like performance of classroom-setting L2 learners. She assigns an important role to learned linguistic knowledge, which is seen as an alternative route to language production. In fact, the learned system plays a role that is similar to that played by competence, and their outcomes may even be confounded. In other words, learners who are only exposed to the L2 in an instructed setting can become fluent speakers of the L2 by means of learned linguistic knowledge.

As for the second issue, that is, the fact that achieving native-like proficiency is rare even for learners[7] immersed in an

6 Evidence that a structure is not permitted in a language through explicit correction or lack of occurrence.

7 The term "learner" is used in a broad sense, meaning people who learn the L2 in a formal classroom setting or through natural contacts with the L2.

L2 context, Towell and Hawkins (1994) observe that instruction and negative feedback are additional tools to modify learners' interlanguage. As learners in an L2 setting very often do not attend language classes, they might continue to resort to L1 transfer when producing L2 utterances, without realizing that the L1 parameters are sometimes inappropriate for the L2. Thus, if these learners continue to transfer inappropriate L1 parameters to the L2 for a long time, the structures in question may become fossilized and will be very difficult to modify after these learners achieve a more advanced proficiency level (Towell & Hawkins, 1994; Baptista, 1995).

The present study sides with Towel and Hawkins (1994) when they affirm that the role of instruction in SLA should not be downplayed for the following reasons. First, instruction provides learners, especially those in an environment where the L2 is not frequently encountered, with input for language acquisition. Second, it can give learners a chance to check and reformulate their hypotheses about the L2. Finally, instruction offers learners an alternative way to communicate successfully by relying on the automatized behavior developed via learned linguistic knowledge. This alternative route is particularly relevant to learners who start learning the language after puberty, when the access to UG (the source for developing competence) is limited.

3.6.2 Instruction and the acquisition of the phonological component

Baptista (1995) points out that explicit instruction is a valuable resource to minimize fossilization at the phonological level, and that it is more likely to be effective if provided at the initial stages of language learning. Based on several assumptions made by the Cognitive Theories (e.g., McLaughin, 1987; Bialystok, 1994; Levelt, 1989; DeBot, 1992; Anderson, 1983), Baptista observes that phonological encoding has to be

automatized so that the learner can produce L2 utterances. At the initial stages of language learning, learners lack automatized phonological processes for the L2 and tend to rely on the L1 phonological processes. The researcher makes a case for the importance of pronunciation instruction as a means of showing these learners that the L1 phonological system should not be directly transferred to their production of the L2.

The acquisition of an L2 is a very complex cognitive task, and in order to cope with it, the learner needs to automatize many of its components (e.g., the grammar, part of the phonological component) so that there is enough capacity available to be used by controlled processing components (e.g., vocabulary retrieving) (Towell & Hawkins, 1994; Baptista, 1995). According to Baptista, automatization can be achieved through extensive practice. This is also true for the acquisition of the phonological component, since learners who lack automatized phonological processes use the L1 processes as default. If L2 learners continue to resort to the L1 phonological processes for a long time, the chances are that this procedure will become automatized, even for cases where the L1 phonological parameters are inadequate for the L2 (Baptista, 1995).

Because human beings have limited processing capacity, they rely on two types of information processing to perform a task: automatic processing and controlled processing. As observed by Baptista (1995, p. 486), automatic processing "(1) doesn't require attention, (2) doesn't occupy any [processing] capacity, and (3) is difficult to be controlled or modified". On the other hand, controlled processing "(1) requires attention and consciousness, (2) occupies the general capacity of cognitive processing, and (3) can be monitored and easily changed".

Acquiring an L2 phonological component requires procedural knowledge (a kind of knowledge that cannot be verbalized: "know how") and declarative knowledge (a kind of knowledge that is verbalized: "know that"). Baptista proposes that the phonological

component involves the "declarative representation of the phonological units in the form of prototypes, and the procedural knowledge of the phonological and articulatory processing of the units and unit sequences." (Baptista, 1995, p. 497)

As mentioned in Section 3.5, Flege (1987) suggested that the phonetic categories are represented in a mechanism called equivalence classification. In other words, learners interpret the L2 sounds based on the phonetic inventory of their L1, which makes many of these learners associate directly the L1 inventory to the L2 and fail to develop an independent phonetic inventory for the L2. Baptista (1992, 1995) believes learners might be able to eventually develop an independent L2 phonetic inventory, provided they receive intensive L2 input. Nevertheless, this inventory tends to be different from that of a native speaker of the target language, which she explains by referring to Rumelhart and Norman's (1978) learning model.

According to this model, learning involves three kinds of processes: accretion, tuning, and restructuring. Accretion is the most common type of learning and it consists of adding new information to existing knowledge. Tuning consists in modifying existing knowledge so that it can fit new information. Finally, restructuring occurs when new schemata (strongly organized knowledge) are created, based on the information obtained by accretion and tuning. Baptista (1995) observes that the learner's phonetic inventory is likely to be different from that of a native speaker because the former's memory continues to store information about the L1 inventory as well as inadequate input provided by the learner's own realizations of the L2 sounds.

Thus, Baptista (1995) proposes that pronunciation instruction plays an important role to prevent learners from transferring inappropriate L1 phonological parameters to the L2. This can be done by helping learners "build both schematic representation and target language procedures" previous to requiring them to comprehend and produce the L1, similar to what happens with L1

acquisition. As she observes, the acquisition of the phonological component requires practice at both the perception and the production levels, since knowledge about the former doesn't transfer naturally to the latter. In fact, production requires the use of motor skills that might be very complex for some learners (e.g., many Brazilians find it difficult to articulate sounds such as /æ/, /ə/, and syllable-final /l/ and /r/).

Baptista's (1995) observations indicate that pronunciation instruction should be a priority at the initial stages of L2 learning. Regarding the phonological component that is the scope of the present study—the English syllable inventory—Baptista suggests that the teaching sequence should involve, first, practice with the open syllables—CV and (C)(C)CV, followed by practice with the closed syllables—(C)VC and (C)(C)(C)VC(C)(C)(C).

This early focus on form and pronunciation might hinder learners' motivation, but Baptista (1995) believes that learners can be convinced of the importance of early focus on form in order to be motivated. Undeniably, pronunciation has to be taught from the very beginning, and it needs to include focus on form and practice at both perception and production. However, it seems that, for the sake of learners' motivation, pronunciation should be taught in conjunction with other language components, which means it is difficult to prevent learners from producing "non-target" sounds at the initial stages of L2 learning.

Celce-Murcia et al. (1996) propose a framework for pronunciation instruction that encompasses focus on form plus integration with the remaining components of the L2 syllabus. As mentioned in Chapter 2, their framework includes five stages: (a) description and analysis (i.e., awareness raising), (b) listening discrimination, (c) controlled practice and feedback, (d) guided practice with feedback, and (e) communicative practice and feedback. Stages (a) and (b) provide learners with explicit information about specific phonological components, when and how these can occur, as well as examples of the targeted

components. This is related to the type of learning called *accretion*, that is, the moment when learners gain knowledge about when and how certain L2 phonological features are used, and the focus is on the perception of the sounds. Stages (c), (d) and (e) focus on production, which begins in a very controlled way, moving from minimal pair practice to the production of contextualized and meaningful sentences. At these final stages, teacher feedback is very important to maximize the probability that the other two types of learning can take place: *tuning* and *restructuring* of the target L2 phonological features. As Celce-Murcia et al. (1996) observe, the selection of the pronunciation components, as well as the communicative functions and the lexical items included in the pronunciation syllabus should be in accordance with the learners' proficiency level and interests, so that motivation is not hindered.

3.6.3 Empirical research on the effects of pronunciation instruction

Although some followers of the Communicative Approach recognize the importance of pronunciation instruction, this is not always reflected in the language curriculum (see Section 2.3). The absence of pronunciation instruction in the language classroom is probably due in part to teachers' deficient training in this area, as well as to a prevailing skeptical view of the effectiveness of any explicit teaching. Several researchers have carried out studies in order to support or challenge the assumption that instruction influences SLA. Some of these studies addressed pronunciation instruction, and a selection of these will be reviewed in this section.

Neufeld (1977) was one of the first researchers who investigated the effects of pronunciation instruction. His study tested whether adult L2 learners were able to achieve native-like performance in an utterance-imitation task after undergoing 18 hours of instruction. The participants were 20 university students, 12 females and 8 males, their ages ranging from 19 to 22 years.

The period of instruction was divided into three phases. In the first phase (lessons 1-3), the participants were not allowed to vocally produce the utterances being taught, and they simply listened attentively to 100 phrases. In the second phase (lessons 4-12), the participants performed tasks that required non-verbal responses: tracing intonation and rhythm contours, and discriminating between phonemes presented in minimal pairs. Finally, in the third phase (lessons 13-15), the participants had to whisper utterances, and, in the last three sessions, they had to repeat the utterances out loud. The rationale behind delayed oral production was that it could prevent the participants from establishing inappropriate acoustic images for the language tokens they were studying. Upon completion of the instructional period, the participants were asked to listen to and repeat a set of sentences in each of the target languages. These sentences were recorded and three native speakers of each language (all of them language teachers) used a five-point scale to rate the participants' performance.

Neufeld's (1977) results suggest that nearly half of the 20 participants, after being exposed to instruction on intonation and articulation of two languages[8] (Japanese and Chinese), were capable of reproducing ten utterances (maximum length: 16 syllables) in these languages at a native-like level. According to the raters, 11 participants were judged to be native speakers of Chinese and nine were judged to be native speakers of Japanese. If one looks closely at the tables reported in Neufeld's study, however, one can see that many of the participants rated as natives in Chinese were also rated natives in Japanese. This indicates that the language aptitude variable, which was not assessed in the study, might explain these participants' superior performance.

Strange and Dittmann (1984) tested the validity of using a specific computer-based task in the acquisition of categorical perception of the contrast /ɾ/-/l/ by Japanese learners of English.

8 The participants also received instruction on Eskimo, but the researcher was unable to analyze the data.

Initially, the researchers had four female participants in the experimental group and four in the control group. The participants were attending an intermediate-level English course in the United States, and their ages ranged from 25 to 33. The pretest and posttest materials consisted of real-speech minimal pairs contrasting /r/ and /l/ in initial, medial and final positions, and two synthetic speech series with the minimal pairs *rock/lock* and *rake/lake*. The training took place during a period of three weeks and included 14-18 sessions with 7 blocks of 18 trials. For each trial, the participants had to discriminate between the target sounds presented in the minimal pair *rock/lock*. The training was entirely computer-based and the program provided the participants with immediate feedback about their answers' correctness. When the four participants in the experimental group had completed the training, both experimental and control groups were given the posttest. Subsequently, the four participants in the control group also underwent the same kind of pronunciation instruction, and after they had completed it, they were given the posttest for the second time. The computer scores were used to evaluate the participants' performance in the pre and posttests. The results revealed that most of the eight participants improved their performance on the synthetic stimulus series after receiving training, but this improvement did not transfer to the natural-speech stimulus.

Jamieson and Morosan (1986) tested whether pronunciation instruction would help Francophone adults to discriminate between the English sounds /ð/ and /θ/. They propose that in order to be successful, pronunciation training should include (a) acoustic training appropriate for normal speech, (b) identification training with immediate feedback, and (c) acoustic uncertainty provided by increasing variability in the acoustic signal. These three features were incorporated into what the authors called a "fading technique", which they consider appropriate for training learners' in perceptual contrasts so that participants' errors are minimized. Thus, the training began with the presentation of

the stimuli in which the contrast between the target sounds was exaggerated and the salient features emphasized. The perceptual contrast was gradually reduced, so that the participants could still perceive them while making few errors. To test the effects of the "fading technique", Jamieson and Morosan (1986) designed a study with 20 Canadians attending an English immersion course who had scored below the 50th percentile on the school's English placement test. Ten participants were male and ten female, and their ages ranged from 18 to 32. All participants completed a pretest, and after that, ten of them received two one-hour pronunciation instruction sessions as described. The other ten participants received no instruction and comprised the control group. Upon completion of the period of instruction with the experimental group, all participants were given the posttest. The results indicate that the kind of training employed by Jamieson and Morosan contributed to the experimental group's improvement in the discrimination of both synthetic and natural speech tokens.

An alternative position regarding the effects of instruction on the acquisition of an L2 assumes that learners can benefit from practice, but these benefits are not immediate. This is the position taken by Yule, Hoffman and Damico (1987), who carried out a study predicting that participants would receive lower scores on a phoneme discrimination task immediately after receiving pronunciation instruction, and that the participants would improve their performance some time after the pronunciation instruction had taken place. 56 intermediate-level English learners enrolled in a pronunciation course participated in this study. The materials consisted of (a) a phoneme discrimination test; and (b) a five-point confidence rating scale, which was used to describe how sure the participants were about making the correct discrimination. The participants were tested three times: (a) In the week previous to the beginning of the course, (b) eight weeks after the course had begun, and (c) fifteen weeks after the course had begun. The

pronunciation course was based on Prator and Robinett's (1985) pronunciation manual.

The results corroborated Yule et al.'s (1987) predictions. Indeed some learners worsened their performance after receiving eight weeks of instruction and improved their performance on the same task after 15 weeks. In addition to the improvements in the percentage of correct responses, the confidence-rating part of the third test indicated that participants' self-monitoring ability also improved after a longer exposure to pronunciation instruction. Thus, Yule et al. suggest "there is a complex interaction over time between simply identifying a sound contrast and being confident that the identification is accurate" (p. 768). This ability is believed to help learners to decide whether they understand what native speakers are saying and to ask for repetition or clarification where necessary, thus facilitating communication.

Yule and Macdonald (1994) tested how four different instructional conditions related to learners' improvement in the production of some target words and phrases and whether improvement would be delayed. The participants in this study were 23 Chinese learners of English in an L2 environment, with proficiency levels ranging from high-intermediate to low-advanced[9]. The participants were asked to make three oral presentations including a set of target vocabulary, which was provided in written form in advance. The target words and phrases were from the field of metrical systems (e.g. derived units, multiples). After performing the first presentation (pretest), the participants were placed into four groups. One group received instruction based on drilling activities conducted by a teacher. Another group also completed drilling activities, but as a self-study task in the lab. The third group received instruction via *modified interactions*, in which an instructor would prompt for clarification of the words and phrases tested by the researchers.

9 The authors neglected to present additional information concerning the participants' background.

Finally, the fourth group—the control group—received no instruction on the target words and phrases. The participants were tested before, immediately after, and two days after the instructional intervention was completed. The three experimental groups received training during a single session. For the teacher-centered and the self-study group, the instructional session lasted ten minutes, while for the modified interaction group, it lasted thirty minutes.

The presentations were tape-recorded and the participants' productions of the target vocabulary were paired and presented to native speakers of American English. These speakers rated the participants' pronunciation of the target vocabulary in terms of which production of a particular item was the most native-like. Based on the results obtained, the researchers concluded that apparently none of the instructional conditions tested were superior to the others, since the experimental groups' and the control group's performances in tests 2 and 3 were similar, with some participants improving, maintaining or worsening their performance across the 3 tests. According to Macdonald and Yule (1994), the results also point to the important role played by individual differences in the L2 acquisition process. Individual differences can be a powerful variable, which makes it difficult to account for the effects of instruction, especially in a study with a small number of participants (an average of almost six participants per group).

Champagne-Muzar, Schneiderman and Bourdages (1993) tested whether pronunciation instruction could improve both learners' perception and production of phones, intonation and rhythm patterns. The participants were 33 learners of varied L1 backgrounds attending a beginning-level French course in Canada. Their ages varied from 18 to 25, and females outnumbered males almost 2 to 1. The participants were attending two different French classes. One class (15 students) received pronunciation training, thus comprising the experimental group, while the other class (19

students) received no pronunciation training and comprised the control group. To assess improvements in discrimination ability, the researchers used a task with three minimal pairs testing the discrimination of phones, intonation patterns and perception patterns. The learners' production ability was tested via an imitation task in which the participants listened to and repeated five sentences, each comprising a maximum of seven syllables.

Before starting the period of instruction with the experimental group, the researchers administered pretests to all participants. The instruction took place during 12 one-hour lessons and the posttests were administered at the end of the semester. From lessons 1 to 6, pronunciation instruction focused on receptive skills; that is, the participants listened to utterances containing the target elements and performed tasks such as discriminating between sounds, identifying particular meanings of intonation contours or rhythm patterns, and drawing them. In the second half of the training, the participants alternated between repetition, transformation (e.g., changing a statement into a question) and listening discrimination exercises. While the experimental group was receiving pronunciation instruction, the control group completed listening comprehension exercises at the language lab. Five native speakers of French rated the participants' production tests using a five-point scale. The raters compared the participants' performance on the five sentences with the native speaker's original recordings. In order to control for bias toward accented speech, the tape given to the raters also contained speech samples of other native or near-native speakers of French.

The results of Champagne-Muzar et al's (1993) study indicate that the experimental group significantly improved their ability to discriminate phones and intonation patterns, but not rhythm patterns. On the other hand, there was no significant improvement in the discrimination abilities of the control group for any segmentals or suprasegmentals. In relation to the participants' production skills, the results show that the experimental group

improved significantly at all levels. The control group improved significantly at the segmental level only, and this might be due to their extensive hours of listening practice.

Elliot (1995) tested the effects of pronunciation instruction on the acquisition of several Spanish vowel and consonant sounds by American learners. The instruction in this study took into consideration different learning styles and used different learning strategies. Therefore, the pronunciation instruction provided in Elliot's (1995) experiment consisted of linguistic descriptions of target segments (e.g., point, place and manner of articulation), which were contrasted with the L1 phonological system when necessary. In order to account for different learning styles and preferences, the researcher included a variety of tasks (e.g., sound identification, repetition, articulation of sounds based on diagrams). The instructor dedicated 10 to 15 minutes of each of the 21 class meetings with the experimental groups to pronunciation instruction. Elliot's experiment consisted of a pretest, an instructional period and a posttest, using two experimental groups (43 participants) and a control group (23 participants) of intermediate language learners. The pretest and the posttest contained tasks checking learners' ability to (a) mimic sounds at word and sentence levels, (b) pronounce written words, and (c) produce the target sounds accurately in spontaneous speech. Three trained judges rated the participants' performances in the pre and posttests. Elliot (1995) found a significant relationship between pronunciation improvement and instruction. This improvement seemed to be restricted to the effect of the instructional treatment, and could not be attributed to other independent variables tested in the study.

Another interesting study testing the effects of pronunciation instruction is Matthews (1997). He carried out a pretest/posttest study with 99 Japanese university students (two experimental and two control groups). The objective was to test whether formal training could influence the perception of the following segmental contrasts: (a) contrasts with two new members: [l]~[r],

[θ]~[f]; (b) contrasts in which only one member is new: [θ]~[s], [f]~[s], [v]~[b]; and (c) contrasts in which both members exist in the L1: [p]~[b]. In the pretest, the stimulus pairs were presented in a discrimination task in which the participants were asked to identify the members of each pair as being the same word or different. The words carrying the target sounds were included in the participants' course material. Each of the six contrasts was tested in twelve experimental pairs, which comprised the pre and posttests task. The pretest was administered one week before instruction began, and the posttest, six weeks after the pretest and one week after the training had finished. There were five training sessions over a period of five weeks, and they focused on the five contrasts that had one or two new members. The methodology consisted of providing the participants with information about the precise articulation of each of the new sounds, with the help of silent visual demonstration, followed by the participants' silent mimicry and the out-loud pronunciation of the same words. Immediate feedback was offered by the instructor and further correction was provided when necessary. The lack of an oral model was thought to prevent learners from developing stimulus-dependent representations. The results indicated that the training had no effect on the acquisition of the contrasts [f]~[s] and [p]~[b], but the researcher explained that, as shown in the pretest, these contrasts were not very difficult for the participants, thus there was little or no room for improvement. There was some improvement in the contrasts [v]~[b], [θ]~[s] and [θ]~[f]. However, training had no effect on the acquisition of the contrast [l]~[r]. The author concluded that pronunciation training has an effect on the acquisition of new segmental representations, but that the L1 phonological system imposes some constraints on this process. The author suggested that these constraints caused instruction to be ineffective in the acquisition of the contrast /l/~/ɾ/, which are allophones of the same phoneme in the participants' L1. Alternatively, one can argue that the liquids are

hard to acquire because, like the vowel sounds, it is difficult to teach learners how to articulate them[10].

The controversial results yielded by the studies reviewed in the previous section come as no surprise if we observe their heterogeneous designs. First, the studies relied on different types of data, testing everything from the production and perception of discrete segments, words and phrases to pronunciation proficiency based on native speakers' holistic perceptions of learners' naturalistic speech samples. Second, the L1 and L2 varied (e.g., Chinese, Japanese, Spanish, French, English), as well as the participants' age and linguistic experience, and the language environment. Third, the instructional methodologies were very different in nature, and the instructional period varied from a single 10-minute session to a weekly class over three school terms. These factors, added to other limitations and problems present in each study, make it difficult to try and compare the results of such varied studies on the effects of pronunciation instruction.

Several studies have investigated the effectiveness of pronunciation instruction. These studies are insufficient to draw any conclusions about the issue, but they certainly reflect the heterogeneity that prevails in the language classroom regarding pronunciation instruction in terms of content selection, teaching methodology, time allocated to the pronunciation component, assessment, and learners' background.

3.7 Conclusion

This chapter discussed important issues addressed in research on SLA, namely, L1 transfer, UG access, age constraints, similarity/dissimilarity and markedness, as well as formal instruction. The conclusion is that all of these factors play a role

10 I am thankful to Professor Marianne Celce-Murcia for bringing this to my attention.

in SLA, but that none of them can be used as the sole explanation for such a complex process as SLA. The present study is meant to contribute to the debate regarding the role played by pronunciation instruction, in conjunction with other factors.

The field of pronunciation instruction is in need of studies that gather data to help clarify its status in the field of SLA. Thus, Pennington and Richards (1986) remind us that such data can only be obtained if future research succeeds at specifying the pronunciation features targeted, and the teaching procedures used, as well as showing how the effects of the treatment were measured. The present study aims to help clarify the status of pronunciation instruction in the acquisition of the L2 phonological component by collecting data that are in accordance with Pennington and Richards' recommendations. The following chapter discusses the research problem addressed by the present study namely, the acquisition of the English syllabic inventory by Brazilian learners.

4. The acquisition of the L2 syllabic inventory

4.1 Introduction

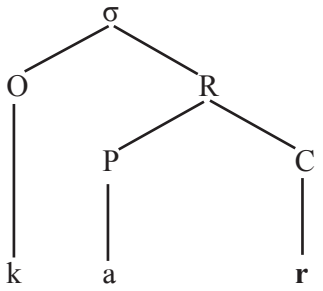
The present study investigates the acquisition of the phonological component at the syllabic level in SLA. Thus, the following chapter reviews theoretical and empirical studies in order to verify the extent to which the factors influencing SLA can provide us with insights on how L2 learners acquire the syllabic inventories of the TL.

The chapter begins with a review of Hooper's model of phonology (1979), which is followed by a description of the syllabic inventories of both English and Brazilian Portuguese. The chapter closes with a review of empirical studies on the acquisition of the English syllabic inventory by Brazilian learners and by explaining the goal of the present study.

4.2 The syllable in Generative Phonology

The syllable has received different definitions in the fields of Phonetics and Phonology (Crystal, 1997, pp. 374-375; Koerich, 2002, pp. 11-13). The present study adopts the definition provided by Selkirk (1982), in which a syllable (σ) is a phonological unit that consists of an onset (O) and a rhyme (R), which contains a peak (P) (also called nucleus) and a coda (C). Of these elements, the peak is the only one that is obligatory, and this slot is normally

occupied by a vowel[1], whereas the other slots are optional and are occupied by consonants or glides. This structure can be exemplified with the word *car*.



Natural Generative Phonology brought the syllable component into phonological models, and one of its most frequently cited scholars is Hooper (1979). She suggests a hierarchy (p. 196) for the segments that may constitute a syllable, as illustrated below.

Optimal syllable-initial →	Obstruents	← Optimal syllable-final
	Nasals	
	Liquids	
	Glides	
	Vowels	

As Hooper points out, the hierarchy goes in opposite directions according to the syllable position occupied by the segment: initial or final. Thus, the less sonorant a sound is, the more suitable it is for syllable-initial position, and the less suitable it is for syllable-final position. Conversely, the most sonorant

1 Or, occasionally, by a syllabic consonant in English (*button* [bʌtn̩]) (Crystal, 1997).

sounds are more likely to appear in syllable-final position than in syllable-initial position.

According to Hooper, the intrinsic structure of a syllable is heavily dependent on strength relations. In other words, the strongest (most sonorant) segments are optimal candidates to occupy the most important part of the syllable—the nucleus, while the weakest segments (least sonorant) are optimal candidates for the marginal positions (onset and coda). Such a relationship is illustrated below:

MARGIN	NUCLEUS	MARGIN
obstruents nasals liquids glides **vowels** glides liquids nasals obstruents		

Hooper observes that syllable-final position is weaker than syllable-initial, in the sense that the former is more susceptible to phonological processes and has a smaller inventory of occurring segments. The author also points out that the CV syllabic pattern has universal status, and this is further proof that syllable-final position is weaker than syllable-initial. The CV syllable is considered the least marked pattern because it is found in every language of the world (and for some languages it might be the only one), and it is learned first by children (Hooper, 1979). If we observe the syllabic and consonantal inventories of English and Brazilian Portuguese displayed in Table 1, we can see that the latter has a more restricted set of syllabic patterns and consonants in both initial and final positions than the former. As the present study is concerned with word-final consonants, this section will concentrate on the consonants that can occupy this position.

Table 1

English and Brazilian Portuguese syllabic patterns, consonantal inventories, and word-initial and word-final segments.

	Brazilian Portuguese	English
Syllabic pattern	(C)(C)V(C)(C)	(C)(C)(C)V(C)(C)(C)(C)
Consonants	/p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /s/, /z/, /ʃ/, /ʒ/, /χ/, /m/, /n/, /ɲ/, /l/, /ɾ/, /w/, /j/, /ʎ/*	/p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /h/, /tʃ/, /dʒ/, /m/, /n/, /ŋ/, /l/, /hw/, /w/, /j/
word-initial consonants	/p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /s/, /z/, /ʃ/, /ʒ/, /χ/, /m/, /n/, /l/, /ɾ/	/p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /h/, /tʃ/, /dʒ/, /m/, /n/, /r/, /hw/, /w/, /j/**
word-final consonants	/R/, /l/, /S/	/p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, /m/, /n/, /ŋ/, /ɾ/, /r/, /w/, /j/

* The sounds [tʃ] and [dʒ] are allophones of /t/ and /d/, respectively. The rhotics, represented by the archiphoneme /R/, are subject to different pronunciations when they appears in syllable onset or coda (for example, [R], [r], [X]).

** The sound /ʒ/ is rarely found in syllable-initial position.

Note: The parentheses indicate that the elements are optional. The sources for Brazilian Portuguese consonants are Monaretto, Quednau and Hora (1996), and Vandressen (1999). As for English, Prator and Robinett (1985), and Celce-Murcia et al. (1996) are the sources.

If we analyse the syllabic inventory of Brazilian Portuguese (Table 1), we can see that it allows only a few consonant clusters with a maximum of two positions in the onset and coda: (C)(C)

V(C)(C)[2]. Note that the presence of two consonants in the coda is restricted to sequences of glides plus the sibilants [z], [ʒ], [s], and [ʃ] (e.g., *mais* "more" [majs], *vez* "time/turn" [vejs]. Moreover, there are severe restrictions regarding the consonants that can appear in word-final position**:** /R/, /l/, /S/, which are subject to several phonological processes (Vandressen, 1999). In word-final position, the /R/ can be deleted (especially with verbs) or pronounced as a tep, a glottal or a velar fricative (e.g., *comer* "eat" [ko'meχ]); /l/ is generally realized as [w][3]; and /S/ has different allophones depending on the phonological context and dialectal variations: [z] or [ʒ], when followed by a voiced sound, [s] or [ʃ], when followed by a voiceless sound or a pause (e.g., *os dois* "the two" [oz.dojs]); *os teus* "yours" [os tews]. Moreover, /S/ is sometimes deleted in word-final position, especially in some dialects (e.g., *os livros* "the books" [oz.livRu]). BP also has words that are spelled with a word-final <m>, or, more rarely, <n>, but these spellings are pronounced as nasal diphthongs, as in the following example: *bom* "good" [bõw] (Vandressen, 1999).

In English, several types of consonant clusters are possible, with up to three consonants in the onset and four in the coda: (C)(C)(C)V(C)(C)(C)(C) (Prator & Robinett, 1985). All consonants except for /h/ can appear in syllable and word-final positions. Final clusters can have two consonants, as in *past* [pæst] and *hard* [hard], three consonants, as in *parts* [parts] or, more rarely, four consonants, as in *texts* [tɛksts]. The more complex final-clusters tend to result from the addition of the plural or past tense endings.

2 The status of the glides in BP is controversial, with some authors claiming that they should be interpreted as consonants (e.g., Câmara, 1953, as cited in Cristófaro, 1999; Barbosa, 1965, as cited in Matteus & d'Andrade, 2000), and others claiming they are vowels (e.g., Collischonn, 1996). The present study follows the first interpretation, with sequences of vowel + glide being interpreted as VC. For a different view, see Koerich (2002, p. 29).

3 Or more rarely, in word-final position, as [ɬ] (e.g., *mal* "bad" [maw] or [maɬ]). (Collischonn, 1996; Monaretto, Quednau & Hora, 1996)

The analysis of the consonantal and syllabic inventories of Brazilian Portuguese offers support for Hooper's proposal regarding the severe restrictions on consonants in syllable-final position. The English inventories, however, are not subject to such restrictions, since both onsets and codas accept a wide range of consonants and a variety of syllabic patterns are possible. In fact, in English, syllable-final clusters can be even more complex than syllable-initial ones. Nevertheless, as pointed out by Celce-Murcia et al. (1996), English final clusters are also difficult for native speakers to pronounce, and are, thus, subject to several syllable simplification strategies. The most common syllable simplification strategies used by English native speakers are unreleased consonants, cluster reduction, and resyllabification. The first strategy is generally used with certain two-member clusters, such as *taped* [tejp̚t] and *bulb* [bʌlb̚], while the second is common with some three and four-member clusters: *asked* [æst] (instead of [æskt]), *sixths* [sɪks] (instead of [sɪksθs]). Finally, resyllabification is common with heterosyllabic clusters: *I planned it* [aj.plæn.dɪt] instead of [aj.plænd.ɪt]. This offers further support to Hooper's (1979) proposal that syllable-final position is a weak environment.

The fact that the syllabic inventory of English is more complex, thus more marked than Brazilian Portuguese (BP) might account for the difficulties posed by many English clusters and word-final consonants for Brazilian learners of English. These difficulties have been attested by several studies (Major, 1987; Rebello, 1997; Silva Filho, 1998; Koerich, 2002; Rauber, 2002; Cornelian Júnior, 2003), and in order to cope with them, learners tend to resort to syllable simplification strategies.

4.3 L2 Syllable Simplification Strategies

Research has indicated that the two most important strategies of syllable simplification found in L2 renditions of

impermissible syllabic patterns are consonant *deletion* and vowel *insertion* (e.g., Carlisle, 1994; Rebello, 1997, Silva Filho, 1998). When the deletion strategy is used, speakers eliminate one or more segments comprising a syllable. For instance, native speakers of English tend to simplify the cluster /ndz/ in the word "hands" /hændz/ by deleting the consonant /d/, thus pronouncing the word as [hænz]. When speakers resort to vowel insertion as a syllable simplification strategy, a vowel is inserted before or after a consonant segment in a *tautosyllabic* or a *heterosyllabic* cluster. Tautosyllabic clusters contain a sequence of two or more consonants in the same syllable: "street" [strit], whereas heterosyllabic clusters contain a sequence of two or more consonants that belong to different syllables: "mainstream" ['mein.strim] (Rebello, 1997)[4]. Vowel insertion also occurs with word-final consonants (e.g., *take* ['tejki]).

Examples of how language learners resort to vowel insertion to simplify initial clusters that violate the L1 syllabic inventory can be found in the interlanguage of Brazilian and Japanese learners of English as an L2. For example, Brazilian learners may pronounce "sky" with an epenthetic vowel preceding /s/ in the /sk/ cluster: [is'kaj] (Rebello, 1997). On the other hand, Japanese learners may pronounce the same word inserting a vowel between /s/ and /k/: [su'kaj] (Abrahamsson, 1997). As regards word-final consonants, Brazilian learners tend to add a vowel to words ending with (a) stops, (b) some fricatives (/f, v, ʃ, ʒ/), and (c) affricates (/tʃ, dʒ/) (Silva Filho, 1998). This is illustrated by their pronunciation of words such as "tape" ['tejpi], "catch" ['kætʃi], and "hush" ['hʌʃi].

In languages such as English, the deletion strategy is preferred, and this is attested by studies on the syllable simplification strategies employed by adult native speakers[5] when dealing with more complex consonant clusters (Temperley,

4 From now on, the term cluster will be used to refer to both types of clusters.

5 Studies on different world languages have indicated that, in child language acquisition, the deletion strategy is also preferred over epenthesis (Young-Scholten & Archibald, 2000).

1983 and 1987; Young-Scholten & Archibald, 2000). On the other hand, in BP, vowel insertion is the strategy most commonly resorted to by adult native speakers when dealing with complex syllabic patterns in the L1 (Câmara, 1970). The preference for vowel insertion is also attested by studies investigating the acquisition of English syllabic structures by Brazilian learners (Rebello, 1997; Silva Filho, 1998). Thus, the word 'next' is likely to be pronounced as [nɛks] by native speakers of English, but as ['nɛkstʃi][6] or even ['nɛkistʃi] by Brazilians learners of English.

Due to these constraints on the L1 syllable structure, Brazilian learners tend to resort to an epenthetic vowel [i], or [ɛ] (Câmara, 1970) to pronounce English consonant clusters that are not permitted in the L1. These learners tend to resort to the same process to simplify complex clusters or to pronounce words ending in consonants that are not allowed in word-final position in their L1.

In the L1, this process can be exemplified by the pronunciation of the words *substituir* "substitute" and *advogado* "lawyer". In BP, these words are separated into syllables as follows (Michaellis, 1998):

subs-ti-tu-ir (four syllables)
ad-vo-ga-do (four syllables)

The cluster "bs" and the consonant sequence "dv" are unacceptable segments in the phonology of BP, and this is reflected in the pronunciation of such clusters and segments in normal speech:

([subistʃitu'ix]) su-[bis]-ti-tu-ir (five syllables)
([adʒivo'gadu])a-[dʒi]-vo-ga-do (five syllables)

6 The palatalization of /t/ and /d/ when they are followed by the vowel [i] is a phonological process commonly found in many dialects of BP: dia "day" ['dʒia], *tia* "aunt" ['tʃia] (Cristófaro, 1999).

Furthermore, BP native speakers with poor spelling would probably write the word "substituir" with the extra vowel <i>— *subistituir*[7]. This seems to indicate that these native speakers have a mental representation of the word containing the epenthetic vowel /i/. Thus, words containing these and other impermissible types of clusters are most likely to be pronounced with the help of an epenthetic [i] or [e], changing the syllabic pattern of the words and adding an extra syllable to them[8].

Native speakers of BP also resort to an epenthetic vowel to pronounce consonant clusters and word-final consonants that are not permitted in their L1 with words borrowed from other languages, as illustrated by the English words below:

"club": *clube*	['klubi][9]
"game": *game*	['gejmi]
"stress": *estresse*	[istrɛsi]

Another phonological process found in the pronunciation of word-final clusters and consonants is *devoicing*. When this process occurs, voiced consonants are replaced by their voiceless counterparts, as in the following example: "bag" /bæg/ is pronounced as [bæk]. This process is found in the pronunciation of native and non-native speakers of English (Yavas, 1997, Baptista & Silva-Filho, 1997, Silveira, 2002a and 2002b). However, in native-speakers' productions there is partial devoicing and vowel length is a key factor to distinguish between minimal pairs such

7 I thank Barbara O. Baptista for bringing this to my attention.

8 In BP, the syllable-separation rules and the epenthetic vowel process may violate morphological units. For example, the word *substituir* is separated in different ways in writing and natural speech, and both separations violate the original form of the prefix "sub":

sub-stitu-ir	(morphological separation)
subs-ti-tu-ir	(Portuguese syllable-separation rules)
[su.bis.ti.tu.'ix]	(normal speech phonological separation)

9 The mid vowels [e] and [o] are commonly produced as high vowels ([i] and [u], respectively) in most BP dialects in word-final position (Cristófaro-Silva, 1999).

as "bag" and "back". Researchers have suggested that voiced consonants are devoiced due to the markedness of these types of consonants in coda position among the world languages (e.g., Hooper, 1979; Yavas, 1994).

4.4 Empirical research on the acquisition of the English Syllabic Inventory by Brazilian learners

Studies on the acquisition of L2 syllabic structure have focused on initial clusters: "street", "plain" (e.g., Broselow, 1987; Carlisle, 1991; Eckmann & Iverson, 1993; Rebello, 1997), and final clusters: "first", "strength (e.g., Eckman & Iverson, 1994; Tropf, 1987), as well as word-final consonants: "pet", "cup" (e.g., Yavas, 1997; Silva Filho, 1998; Koerich, 2002). The main purpose of these studies was to identify: (a) the syllable simplification strategies to which learners of different L1 backgrounds resort, and (b) the most difficult syllabic patterns. The following section will focus on studies investigating final clusters and word-final consonants.

4.4.1 Final clusters and word-final consonants

In addition to initial clusters, L2 interphonology research has investigated the acquisition of word-final clusters and word-final consonants, both in conjunction and separately. Tropf (1987) carried out a study with Spanish learners of German in order to verify whether *sonority* could account for interlanguage variability in the production of syllable-initial clusters, syllable-final clusters and word-final consonants in German. The results indicate that the more sonorant consonants are deleted less frequently, but are produced with a greater degree of variability. Based on these results, the researcher proposes the following hierarchy of difficulty for consonants in initial and final clusters,

as well as word-final consonants, from least difficult to most difficult: laterals, nasals, fricatives, plosives. This hierarchy is similar to Carlisle's (1994), but only as regards laterals, nasals and plosives, since Carlisle only tested word-initial clusters and did not test fricatives.

Eckman and Iverson (1994) investigated the interlanguage of Japanese, Korean and Cantonese learners of English. They tested the hypothesis that typological markedness can be a good predictor of the acquisition of single consonants in word-final position. The hypothesis was partially confirmed, since obstruents (which are predicted to be more marked than nasals and liquids) were generally more difficult, but the L1 factor interfered with the pronunciation of nasals and liquids in word-final position. For two Japanese learners, the nasals were more difficult than the obstruents (Japanese has only the alveolar nasal in final position). Liquids were more difficult than nasals for all except one subject (the speakers of these languages had to learn not only how to produce the liquids in final position, but also how to distinguish between the two liquids, a distinction which is absent from their L1). Thus, Eckman and Iverson concluded that "it seems that transfer can overrule the predictions made by sonority" (p. 27).

Based on their results, Eckman and Iverson (1994) proposed a hierarchy of difficulty for word-final consonants, where the obstruents appear as the most difficult ones, in this order: affricates[10], fricatives, and plosives, with the voiced consonants being more difficult than the voiceless consonants. The second most difficult class of consonants in final position, according to Eckman and Iverson (1994) and Tropf (1987), is the nasals, followed by the liquids. But within the class of obstruents, Tropf's hierarchy differs from Eckman and Iverson's. Tropf proposes that

10 Affricates are rarely included in the sonority scales, probably because of their complexity. Hooper (1976) ranks them as the least sonorant among the obstruents, thus leading to the prediction that affricates are the most marked consonants in final position, followed by the stops, which are followed by the fricatives.

fricatives (and affricates) are more difficult, while Eckman and Iverson believe that plosives are more difficult.

Baptista and Silva Filho (1997) studied the acquisition of English word-final consonants by Brazilians. They found that these learners tend to resort to paragoge to produce word-final consonants that are not permissible in their L1. Based on their results, they proposed a hierarchy of difficulty (from least to most difficult) for the following word-final consonants[11]:

1. Sonorants (/m/, /n/, /ŋ/)

2. Stops (/p/, /b/, /t/, /d/, /k/, /g/), and within this category, first the bilabials, followed by the alveolars and the velars.

3. Fricatives (/f/, /v/, /s/, /z/, /ʃ/, /ʒ/)

4. Affricates (/tʃ/, /dʒ/)

Note that the place of articulation of the target consonants affected the difficulty posed by them, for within the category of stops, the bilabials are less marked and therefore less difficult to produce than the alveolars, or velars. As regards voicing, for almost all voiced/voiceless pairs, the voiced pair caused more paragoge. In addition to voicing, place and manner of articulation, the factor "environment" contributed to the difficulty level of word-final consonants. In Baptista and Silva Filho (1997), word-final consonants were most difficult to pronounce when followed by a consonant, somewhat easier when followed by a vowel, and easiest when followed by a pause.

Baptista and Silva Filho's (1997) finding that the place of articulation is another factor influencing the degree of difficulty

11 Their study did not test for the liquids.

posed by final consonants corroborates the results of Yavas (1997) on the devoicing of final consonants. Yavas (1997), in addition to testing the effects of the place of articulation of the target consonants, also investigated the effect of the height of the preceding vowel on the production of final-voiced stops. The results indicate that high vowels preceding velars, alveolars and bilabials (where velars are more difficult than bilabials) trigger more devoicing than low vowels, at least for non-native speakers of English.

Research has also shown that the environment surrounding clusters and word-final consonants can affect the acquisition of L2 syllabic patterns. Three types of environment can precede or follow clusters and word-final consonants: pause, vowel and consonant. Carlisle (1991, 1992) proposed that the environment preceding initial /s/ clusters might either contribute or hinder their acquisition. From the three possible environments, Carlisle found that initial clusters preceded by a pause are the least difficult, and initial clusters preceded by a consonant are the most difficult. These results are similar to Baptista and Silva Filho's (1997) regarding the environment following word-final consonants.

Edge (1991) investigated the production of word-final consonants by Japanese and Cantonese learners, as well as by native speakers of English. Edge's results indicate that in less controlled tasks (cued story-telling and text reading), the environment *pause* was generally responsible for the few occurrences of paragoge, while in a more controlled task (word-list reading), the paragoge rate increased significantly, thus confirming that the environment *pause* favored paragoge. This finding contradicts Baptista and Silva Filho's (1997) results for Brazilian learners, who tended to resort to paragoge most frequently when the target consonants were followed by a consonant, and least frequently when they were followed by a pause.

4.5 Conclusion

The studies reviewed in this section indicate that the acquisition of L2 syllabic inventories might pose difficulties for language learners, due to their complexity of structure, markedness, L1 transfer, and the environment surrounding the syllable. Both Eckman and Iverson (1994) and Yavas (1994) observe that it is important to take into account the findings of interphonology research when planning pronunciation instruction. Eckman and Iverson (1994) stress that the coda position is extremely marked, with greater restrictions as to the segments that can occur, which makes codas difficult to acquire. Therefore, codas should be emphasized in pronunciation instruction, regardless of the students' L1, because the presence of a certain segment in the inventory of the L1, and even in coda position, is not sufficient to predict lack of difficulty, since typological markedness can interfere with the acquisition of word-final consonants. Yavas (1994) recommends that practice with word-final consonants should start with monosyllabic CVC words, moving on to longer words with more complex syllabic patterns. In addition, it is important to practice final consonants not only in isolation, but also in context, starting with the easiest environment and progressing to the most difficult. Yavas observes that training with final consonants in isolation and in context can be alternated, as well as the degree of difficulty of the final consonant in relation to its articulation and preceding and following environments.

The results and recommendations of some of the studies reviewed in this section suggest that the acquisition of word-final consonants is an important research topic. Equally important is the investigation of the role played by instruction in the development of L2 learners' pronunciation. Therefore, the present research investigates the role played by pronunciation instruction in the acquisition of English word-final consonants by Brazilian

learners. It is hypothesized that pronunciation instruction, based on the communicative framework proposed by Celce-Murcia et al. (1996) (see Sections 2.3.3 and 3.6.2), can help these learners reduce the frequency of paragoge in the production of word-final consonants. The use of an epenthetic or a paragogic vowel modifies the rhythm of the English language, since it creates an additional syllable, which might also result in word-stress alternation. This affects comprehension by native speakers of English, which is highly dependent on rhythm (Garcia, 1990), and possibly the comprehension of English users from different L1 backgrounds. Thus, testing the effects of pronunciation instruction on the acquisition of word-final consonants is a good opportunity to connect theory and practice and to contribute to the understanding of controversial issues in the fields of second language acquisition and instruction.

5. Method

5.1 Introduction

The present research is an investigation of the role played by pronunciation instruction in the acquisition of English word-final consonants by Brazilian learners. The study consists of a pretest, followed by a period of instruction, and a posttest. For the instructional period, the researcher developed a pronunciation manual containing activities that aimed at minimizing the addition of a vowel after word-final consonants. More specifically, the study aimed at developing materials that (a) are appropriate for the teaching of the pronunciation of word-final consonants to beginning-level Brazilian learners of English; and (b) are based on the results yielded by research in the field of interphonology, taking into account the role of L1 transfer, the different syllabic patterns of English and Brazilian Portuguese, the varying degrees of difficulty posed by different word-final consonants in different environments (Baptista & Silva Filho, 1997; Silva Filho, 1998), and that (c) employ the framework suggested by Celce-Murcia et al. (1996), which is based on the Communicative Approach to second language teaching.

5.2 Participants

Two groups of Brazilians studying English in the Extracurricular course (level 1) at the Universidade Federal de Santa Catarina[1] participated in this study. The groups consisted of 16 and 15 students, respectively, most of them graduate and undergraduate students pursuing different majors, and a few junior high students or other people from the community[2]. However, only 12 students from the experimental group and 10 from the control group completed all the tasks used to collect the dataset of the present study. One group was selected as experimental and received a period of instruction based on the pronunciation manual developed for this study, while the other did not receive any kind of instruction regarding the features investigated in the study, thus serving as the control group. The researcher was in charge of teaching both the experimental and the control groups. The textbook on which the entire course was based was *New Interchange I* (Richards, Hull, & Proctor, 1997).

The experimental group consisted of 6 males and 6 females, their ages ranging from 18 to 28 (M=21.83, SD=3.01). This group received, during part of their normal class time, 6 weeks of instruction based on the pronunciation manual. The control group consisted of 7 males and 3 females, their ages ranging from 14 to 22 (M=18.88, SD=2.66). The students in this group did not receive any kind of explicit instruction regarding the pronunciation aspects investigated in the present study. Both the experimental and the control groups had classes twice a week in the evening.

1 The Extracurricular Courses are the language service courses offered at Universidade Federal de Santa Catarina. Level 1 students might be real or false beginners regarding their English proficiency. Most of these students have had previous contact with English in junior high and/or high school, since English is very often the compulsory foreign language taught in school.

2 The Extracurricular courses are open to the community as a whole, although most of the students are undergraduates or graduates.

5.3 Materials

The dataset was collected with the help of a production test, a perception test, two questionnaires, and two written exams.

5.3.1 Questionnaire

At the end of the semester, both the experimental and the control groups completed a questionnaire (see Appendix A) to provide information about (a) personal characteristics (e.g., name, age, birthplace, and place of longest period of residence), (b) foreign/second language knowledge, (c) previous contact with English, and (d) preferred language skills. The experimental group also completed a follow-up questionnaire (see Appendix B) containing 3 questions designed to evaluate the pronunciation classes and materials.

5.3.2 Production pre and posttests

The task for the production pretest and posttest consisted of a set of sentences containing target words with word-final consonants (see Appendix C). The selection of the target words, their segments and the environment surrounding the words in the sentences took into consideration Baptista and Silva Filho's (1997) recommendations in relation to the hierarchies of difficulty, the combination of segments within the syllable and the environment following the syllable (see Section 4.4.2).

The pre and posttests included 78 sentences, each one containing a word with a target final consonant. The target consonants included in the production test were: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, /ŋ/. Some of the consonant sounds that can occupy word-final position in English were excluded because they are known to cause additional difficulties for Brazilian learners due to spelling interference or articulation

difficulties (/r/, /l/, /ð/, and /θ/). Other word-final consonants were also excluded due to the low rate of paragoge that they yielded in a previous study (/ʃ/ and /tʃ/)[3], or low frequency in word-final position (/ʒ/). The sounds /s/ and /z/, (also pronounced as [ʃ] and [ʒ], respectively, in Portuguese, depending on the dialect), were not tested because they occur word-finally in Brazilian Portuguese, and thus are not expected to trigger paragoge.

In order to test for the effects of lexical knowledge in the participants' pronunciation of the target words, a group of sentences containing nonsense words ending in the sounds /k/, /t/, and /d/[4] were included in the pre and posttests. These sounds were tested 3 times each, with 2 different words, one ending in a consonantal grapheme and another one ending in the same grapheme followed by a silent <e>.

The 78 sentences in the pre and posttests included 60 tokens for the frequent words (cognates or words thought to be frequent in beginning textbooks) and 18 for the nonsense words. The 60 frequent word tokens consisted of 6 tokens – 2 different words in 3 different environments – for each of the target consonants /p/, /b/, /t/, /d/, /k/, /f/, /m/, /n/, and 3 tokens – one word in 3 different environments – for each of the target consonants /g/, /ŋ/, /v/, /dʒ/. The 2 different words for each of the former 8 target consonants consisted of one ending in a consonantal grapheme and one ending in the same grapheme followed by a silent <e> (e.g., the sound /d/ was tested 3 times with the target word *mad* and 3 times with the word *made*). The inclusion of words containing a silent <e> was intended to test whether the final silent <e> could be an

3 Results from a pilot study (Silveira, 2002a) yielded the following epenthesis rates: /ʃ/: experimental group = 7.4% for the pre and posttests; control group = 0% for the pretest and 7.7% for the posttest; /tʃ/: experimental group = 14.8% for the pretest and 0% for the posttest; control group = 2.6% for the pretest and 5.1% for the posttest.

4 The decision to use these three consonant sounds with the nonsense words is based on the results of previous studies, according to which, these sounds are among the ones to yield the highest epenthesis rates (Silva-Filho, 1998; Silveira, 2002a). In order to keep the test as short as possible, the other target consonants were not tested with nonsense words.

additional difficulty affecting the pronunciation of English word-final consonants, since the final <e> is pronounced in Brazilian Portuguese (e.g., *pel<u>e</u>* "skin" ['pɛli]). Unfortunately, the sounds /g/ and /ŋ/ could not be tested in the *silent* <*e*> condition, since they do not occur in this context in English (the letter <g>, when followed by an <e> is pronounced as /dʒ/, and /ŋ/ is always represented by the spelling <ng> without <e>). On the other hand, /v/ and /dʒ/ were tested only in the silent <e> environment, since they do not occur word-finally in English, without a final silent <e>. Table 2 summarizes the tokens used in the production test.

Table 2

Tokens used in the production test

	Frequent words			
Sounds	Pause context	Vowel context	Consonant context	Number of tokens
p	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
b	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
t	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
d	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
k	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
g	C: 1	C: 1	C: 1	3
f	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6
v	C*e*: 1	C*e*: 1	C*e*: 1	3
dʒ	C*e*: 1	C*e*: 1	C*e*: 1	3
m	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6

n	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6	
ŋ	C: 1	C: 1	C: 1	3	
				Total	60
		Nonsense words			
t	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6	
d	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6	
k	C: 1 C*e*: 1	C: 1 C*e*: 1	C: 1 C*e*: 1	6	
				Total	18

C: target word finishes with consonantal grapheme; C*e*: target words finishes with consonantal grapheme followed by silent <e>.

The target consonants of both frequent and nonsense words were tested in the following environments:

1. V__V (between vowels, e.g., "There is a nice clu<u>b o</u>ver there.");

2. V__C (preceded by a vowel and followed by a consonant, e.g., "He goes to the clu<u>b t</u>o dance."), and

3. V__# (preceded by a vowel and followed by a pause, e.g., "I'm going to the clu<u>b</u>.")

The context vowels were /i/, /ow/, /ə/, /ɛ/, /æ/, and /ɔ/, although three of these are often pronounced somewhat differently by Brazilian learners of English; for example, /owʔ is frequently pronounced as [o], /æ/ as [ɛ], and /ə/ as [a]. The context consonants were /p/, /t/, /k/, /f/, /s/, /h/, /m/, /n/, and /l/. The consonants and vowels that began the words following the target consonants were not previously selected, since the main

concern while designing the test sentences was not to control for the following environment, but to keep the sentence structure and vocabulary as simple as possible.

The words containing the target sounds (a) were monosyllabic, (b) were considered by the researcher to be of frequent occurrence, even in beginning textbooks, and thus probably at least somewhat familiar to the participants, (c) had no clusters that are prohibited in the L1, and (d) had a vowel preceding the target consonant (e.g., if the target consonant was /p/, the carrier word could be *co<u>p</u>*, but not *co<u>mp</u>*). The sentences containing the target words included both statements and questions. They contained a maximum of seven words, to keep pausing to a minimum, and there was an attempt to keep the vocabulary level of the sentences as basic as possible, to try to prevent the participants from stumbling over difficult words. Also, to minimize pauses, the sentences were typed in groups of 10 per page, so that the participants could take short breaks between pages.

5.3.3 Perception pretest and posttest

The study also included a perception test (see Appendix D), which aimed at testing 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*).

The consonants included in the perception test were the same as the ones included in the production test: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /dʒ/, /m/, /n/, and /ŋ/. A categorial discrimination test design (odd item out) was used (Flege, Munro, & Fox, 1994). Different from the test proposed by Flege et al. (1994), which only included sets of three isolated words, the test developed for the present study inserted the target words in a carrier sentence. This adaptation aimed at providing a natural linguistic context to the target words, since learners have to be able to hear phonological

distinctions of words inserted in complete sentences rather than in isolation. Thus, the test designed for the present study included sets of three sentences, where one sentence contained a target word that differed from the other two of the same set. The odd item could be in different positions within the triad. 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 sets: one where the monosyllabic word was the odd one and one where the disyllabic word was the odd one.

A further adaptation of the original categorial discrimination test was the inclusion of six distracter sets containing words dealing with other difficult vowel and consonant contrasts. These distracters were included with the objective of not giving away the target sounds being tested. The test also included 8 "catch-trials" where the three sentences of the set were identical: two of the "catch trials" contained distracters, and six of them contained target consonant sounds (/p/, /t/ and /k/). The "catch-trials" were expected to give some guarantee that the participants were paying attention to the three sentences of each set. Thus, the perception 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. Appendix D brings detailed information about the perception test stimuli.

Three main criteria were used to choose the words containing the target consonants: (a) the words should not contain clusters, (b) the target consonants should be preceded by a vowel, and (c) the words should be perfect minimal pairs, in which the

monosyllabic word ended in a final consonant and the disyllabic word sounded exactly like the monosyllabic word, but ended with the sound /i/ (e.g., *fog*/*foggy*). The words included in the perception test were both frequent and infrequent.

A native speaker of American English (see Appendix D) recorded the sentences used in the perception test. The native speaker was instructed to stop for one second after reading each sentence, and for five seconds after reading each complete set of three sentences. Moreover, two adults not participating in the experiment (see Appendix D) took the test to check for task difficulty before it was administered to the participants in the present study. One of these was a native speaker of American English who could speak French and German as second languages, and the other was a bilingual speaker of Singhalese and English, the latter being her language of literacy. Both of them were Applied Linguistics researchers. The contrasts regarding the target consonants were correctly discriminated by both listeners. However, one contrast used as a distracter in triad 29 (/ow/~/ owl/) proved to be difficult to both listeners, since they failed to discriminate between 'go' [gow] and 'goal' [gowl].

5.3.4 Pronunciation Manual

The pronunciation manual (Appendix E) was used with the experimental group, together with the regular textbook *New Interchange I,* during the instructional period. The content of the manual was limited to activities that aimed to teach learners the differences between English and Brazilian Portuguese syllabic patterns and the inappropriateness of the use of a paragogic vowel as a strategy to overcome the articulatory problems posed by these differences. The activities developed for practice include vocabulary items with the following word-final consonants: /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, and /dʒ/. Due to a strike at the university, which resulted in time constraints, the class time

allocated for treatment had to be shortened. Thus, three units that were originally part of the manual had to be eliminated, all of them dealing with the nasal consonants.

The manual was organized according to the communicative framework suggested by Celce-Murcia et al. (1996). According to this framework, ideally the pronunciation lesson should consist of five steps: (a) description and analysis; (b) training on perception; (c) controlled practice and feedback; (d) guided practice with feedback; and (e) communicative practice and feedback (see Section 3.6.2). Each unit of the manual was designed to incorporate these five steps, with an attempt to both connect the pronunciation component with the rest of the language syllabus and take the learners' level of proficiency into consideration.

5.3.5 Written exams

A mid-term and a final exam (see Appendices in Silveira, 2004) were used to evaluate the performance in the English course of the participants of both the experimental and the control groups. The items included in these exams assessed the participants' knowledge of (a) grammar, (b) vocabulary, (c) reading, (d) writing, and (e) listening comprehension. The results of these exams were used as the main criterion to evaluate the learners in the language course. This additional variable was included to verify whether or not the experimental group lagged behind in their knowledge of grammar and vocabulary, since part of their class time was used to provide pronunciation instruction.

5.4 Procedures

The data collection procedures were carried out separately for the experimental and the control groups, and the perception

and production tests were given in a single session for each. The pretest took place in the seventh week (class meeting 13) after the course had begun, before the instructional period for the experimental groups started[5]. One week after the conclusion of the experimental groups' period of instruction, the posttest was administered to both the experimental and the control groups.

5.4.1 Production pretest and posttest

Before recording the production test, both the experimental and the control groups had a brief training session to learn how to operate the lab. For this training session, the participants read a short passage in Portuguese (see Appendix C). This reading was recorded so that the researcher could use it to identify participants with speech problems that might have affected the data collected for this study[6]. This procedure took place only when the pretest data was being collected.

After finishing the practice session, all the participants began a second task, which consisted of reading aloud and recording the sets of sentences containing the target words. They were told that they could record the sentences as many times as they found necessary, and they were allowed to stop briefly after reading each set of 10 sentences. However, the participants were

5 The initial intention was to administer the pretest after the second week of class, but a very long strike at the university in the previous year affected the schedule of classes of the undergraduate courses. This caused the second semester of 2002 in the undergraduate courses to begin in the last week of September, instead of the beginning of August. The classes in the Extracurricular courses began in the second week of August as usual, but they were interrupted for two weeks in mid September, so that the undergraduate students could have a break. The classes in the Extracurricular course resumed at the end of September, when the second semester of the 2002 undergraduate courses started. The researcher feared losing many participants at that time, since some students might have schedule conflicts between their undergraduate and Extracurricular courses when they registered for the 2002.2 classes. Fortunately, only one student from each group canceled their registration after the break.

6 In a previous study (Silveira, 2002a), this procedure helped to identify a participant who had problems producing a distinction between voiced and voiceless consonants in her L1.

not able to erase any of the recorded versions, as the laboratory equipment does not allow such a procedure. Their reading was recorded on sixty-minute audiocassette tapes, in a Sony LLC-4500MKZ laboratory. The posttest task was the same as the one used for the pretest.

The experimental and the control groups were tested separately. Each participant received a different randomized version of the pre and posttests, in which the same sentences occurred in different orders. This was expected to prevent participants from being influenced by the other participants' pronunciation (as they were recorded simultaneously in the language lab) and to minimize the order effect.

5.4.2 Perception pre and posttests

After the recording of the production test, the perception test was administered. In order to familiarize the participants with the "odd item out" task, the researcher provided them with a brief practice session. For this session, all participants listened to three sets of sentences containing minimal pairs dealing with difficult vowel and consonant contrasts, but not with the target contrast, namely, monosyllabic words ending in a consonant versus disyllabic words ending in the same consonant followed by /iʔ. The researcher checked the participants' answers to make sure they understood how to do the task. Because the perception test format was quite complex, the practice session for the perception test was given twice, once before the pretest and once before the posttest.

As soon as the participants were acquainted with the task, they began the perception test. For this task, they heard the 38 sets of 3 sentences and checked "a", "b", or "c" for the sentence that was different; or they checked *todas iguais* ("all the same"), if the 3 sentences were the same. All the procedures and materials were used again to collect the posttest data.

5.4.3 Instructional period

The instructional period began during the first class meeting after the administration of the pretest and was restricted to the experimental group. The focus of the pronunciation instruction was the learning of English syllabic patterns and its objective was to reduce the occurrence of vowel insertion after word-final consonants. The material on which the instruction was based is the pronunciation manual designed to work with Brazilian learners of English at the beginning level (see Appendix E).

The experiment was carried out as part of a 45-hour language course, taught in one semester and divided into 30 meetings. The classes met twice a week for 15 weeks and the sessions lasted an hour and a half each. For the experimental group, the pronunciation classes alternated with the general language classes, taking about 40 minutes of one weekly class for a period of 6 weeks, resulting in 4 hours of pronunciation instruction. Although the activities in the manual 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.

5.4.4 Questionnaires and written exams

On the day the participants took the final written exam, they were asked to complete the questionnaire (see Appendix A) used to collect demographic and language background data. The participants in the experimental group also completed a questionnaire (see Appendix B) that assessed their opinions about the pronunciation materials used in class. For this last questionnaire, the participants were asked to not reveal their identities.

In addition to the comparison between the pretest and the posttest results, the study included a comparison between the performance of the experimental and the control groups on their written test scores. The participants took the midterm exam when

they returned from their school break (week 6, class meeting 12) and one week before the two groups took the pretest. The final exam was given at the end of the semester (week 15, class meeting 29), one week after the posttest data were collected.

5.5 Data Analysis

The information collected via questionnaire was used to assess the influence of the variables sex, age and language experience on the acquisition of word-final consonants. These variables and the participants' written exam scores were compared to the perception and production test scores.

The target word of each sentence produced by the participants in the production test was phonetically transcribed by the researcher. A small sample of these words was transcribed again by three different listeners, all of them with previous experience in phonetic transcription in order to obtain a reliability rate of 90%. Finally, one of the listeners was chosen to check the transcription of 50% of the data, together with the researcher. The second listener transcribed only the final sound of the target words, then this transcription was compared to that made by the researcher. In case of disagreement, both the listener and the researcher would listen to the target words until they reached an agreement. The participants' scores on the perception test were tabulated and compared to the participants' scores on the production test.

Descriptive statistics were done and Mann-Whitney tests[7], Wilcoxon and Friedman tests[8], gain scores, and correlations

7 This is a non-parametric test that is equivalent to the independent-samples t-test (between-group comparison), which would have been less appropriate here because there were fewer than 30 subjects in the study.

8 Both Wilcoxon and Friedman tests are non-parametric tests. The first is equivalent to a paired-sample t-test (within-group comparison), and the second is equivalent to a Repeated-Measures ANOVA (within-group comparison for independent variables with more than two levels). The non-parametric tests were used due to the small sample size.

were run using the following variables, where appropriate: (a) perception and production pretest/posttest scores, (b) group: experimental/control, (c) markedness variables (sonority, voicing, and place or articulation), (d) lexical knowledge frequent words and nonsense words), (e) order effect (positions of the odd item: a, b, and c in the categorical discrimination test), (f) following environment (pause, vowel, and consonant), (g) orthography (words ending in a consonantal grapheme and words ending in a silent <e>), (h) written exam scores (mid-term and final exams), (i) age, (j) sex, and (k) learners' language-learning experience.

The statistical tests were run with the help of SPSS[9] for Windows, version 8.0. The probability level of statistical significance was set at .05 in the analyses. The 20 hypotheses tested in this study will be stated in the next chapter, in the introductory part of each section. The next chapter presents and discusses the results of the data analysis.

9 Statistics Package for Social Sciences

6. Results and discussion

6.1 Introduction

This chapter reports and discusses the results for the perception and production pre and posttests, with a focus on the effects of pronunciation instruction on the performance of the experimental group. In Sections 6.2 and 6.3, the data analysis includes the following comparisons: (a) across-groups, (b) within groups, and (c) practiced versus non-practiced consonants, first for the perception, and then for the production test. Section 6.2 also discusses whether 2 test design variables influenced the posttest results, while Section 6.3 presents the results concerning (a) the order effect for the perception test, (b) the following environment effect, (c) orthography effect, and (d) lexical knowledge effect for the production test. Possible interactions between the perception and the production tests are discussed in Section 6.4.

In Section 6.5, the perception and production data are reanalyzed with emphasis on the consonants grouped according to the phonological features sonority and voicing. For the production test, another feature was analyzed—place of articulation. The analysis of the consonants in their natural classes culminates with an attempt to propose preliminary hierarchies of difficulty for the perception and production of English word-final consonants by Brazilian learners.

Section 6.6 discusses the possible effects of the pronunciation syllabus on the regular language syllabus (as measured by the participants' performances on their written exams) and offers further analyses of some individual differences variables collected with the help of the questionnaires. The following variables for individual differences are addressed: (a) gender, (b) age, (c) private English course attendance, (d) favorite language component, (e) learning of another foreign language, (f) travel to an English speaking country, and (g) additional exposure to the L2. These variables are compared to the participants' performance in the perception and production pre and posttests, as well as their scores in the written exams. This section ends with a discussion of the experimental group's evaluation of the pronunciation instruction material and procedures. Finally, Section 6.7 summarizes the main results.

6.2 Perception Test

The perception test was used to assess the participants' ability to discriminate between monosyllabic words ending in certain consonants (e.g., "fog") and disyllabic words ending in the same consonants followed by /i/ (e.g., "foggy"). More specifically, the perception test assessed the participants' ability to discriminate between CVC and CV.CV words. The tested CVC tokens contained word-final consonants that do not occur in this position in their L1.

The analysis of the perception test results begins with an evaluation of the possible difficulties that its design might have imposed on the participants. This is the topic of Section 6.2.1, which analyzes the participants' scores for the "catch trials", and Section 6.2.2, in which the order effect is evaluated. Section 6.2.3 concentrates on the analysis of the dataset with the target consonants, including across and between group comparisons, as

well as a comparison between the consonants that were present in the pronunciation manual (practiced consonants) and those that were not (non-practiced consonants).

Four hypotheses guided the data analysis for the perception test:

Hypothesis 1:
The experimental and control groups are similar before treatment in relation to the perception of the contrast between the syllabic patterns CV and CVC (between group analysis).

Hypothesis 2:
Instruction affects perception; thus, the experimental group's posttest scores are different from the control group's posttest scores (between group analysis).

Hypothesis 3:
There is a change in the scores for perception across tests, which is caused by pronunciation instruction (gain scores[1]).

Hypothesis 4:
The consonants that were included in the pronunciation material (practiced consonants) used with the experimental group and the consonants that were not included in this material (non-practiced consonants) yield different rates of correct responses in the experimental group's posttest (within group analysis).

1 Gain scores analysis is a more concise way of comparing differences between two groups (Rogosa, 1988). I opted for using this analysis instead of running two paired-samples t-tests to compare pre and posttest data for each group.

6.2.1 Test design issues: The participants' understanding of the perception test task

The perception test contained eight catch trial sets, two containing non-target contrasts and six with the target consonants. As explained in Section 5.3.3, the catch trials consisted of sets of three sentences that were identical. The role of the catch trials was to verify whether the participants' responses were not mere guesses. In other words, if the participants consistently failed to identify the sentences in the catch trials as being identical, they would be assumed to be making guesses in the perception test, which could be due to low concentration, task difficulty or poor understanding of the task. Hypothesis 1 stated that the participants' scores in the perception test were not a result of mere guesses.

The results displayed in Table 3 show that, in general, most participants in the control group tended to identify the catch trials with non-targets correctly in both the pretest (60%) and the posttest (95%), and similar results were obtained for the experimental group (77% for the pretest, and 86% for the posttest). In relation to the catch trials with target consonants, the control group obtained higher rates of correct identification in the pretest (92%) than in the posttest (82%), whereas the experimental group obtained the same rates in both pre and posttests (83%).

Table 3

Frequency and percentages (in parentheses) of correct responses in the "catch trials" for the control and the experimental groups.

	Control Group					Experimental Group			
	Pretest		Posttest			Pretest		Posttest	
	Non – targets	Targets	Non -targets	Targets		Non – targets	Targets	Non -targets	Targets
S1	1 (50)	5 (83)	2 (100)	5 (83)	S11	2 (100)	5 (83)	2 (100)	5 (83)
S2	2 (100)	5 (83)	2 (100)	4 (67)	S12	1 (50)	4 (67)	1 (50)	4 (67)
S3	0 (0)	6 (100)	1 (50)	3 (50)	S13	1 (50)	4 (67)	2 (100)	6 (100)
S4	2 (100)	6 (100)	2 (100)	5 (83)	S14	1 (50)	6 (100)	1 (50)	4 (67)
S5	0 (0)	6 (100)	2 (100)	4 (67)	S15	2 (100)	6 (100)	2 (100)	5 (83)
S6	1 (50)	6 (100)	2 (100)	6 (100)	S16	2 (100)	6 (100)	2 (100)	5 (83)
S7	1 (50)	4 (67)	2 (100)	6 (100)	S17	1 (50)	6 (100)	2 (100)	6 (100)
S8	1 (50)	6 (100)	2 (100)	6 (100)	S18	0 (0)	2 (33)	1 (50)	4 (67)
S9	2 (100)	5 (83)	2 (100)	4 (67)	S19	2 (100)	5 (83)	2 (100)	5 (83)
S10	2 (100)	6 (100)	2 (100)	6 (100)	S20	2 (100)	6 (100)	1 (50)	6 (100)
					S21	1 (50)	4 (67)	1 (50)	4 (67)
					S22	2 (100)	6 (100)	2 (100)	6 (100)
Total	12 (60)	55 (92)	19 (95)	49 (82)	Total	17 (71)	60 (83)	19 (79)	60 (83)

Note: Control group: N non-targets=20; N targets=60. Experimental group: N non-targets=24; N targets=72.

Table 3 shows that in the pretest the control group was better at identifying correctly the catch trials containing target consonants (92%) than the ones with non-target consonants (60%)[2]. However, in the posttest, the catch trials with non–targets (95%) were identified more correctly than those with targets (82%). Table 3 shows similar results for the experimental group in both the pretest (target catch trails: 83%; non-target catch trials: 77%) and the posttest (target catch trails: 83%; non-target catch trials: 86%).

These results seem to indicate that the participants were not merely making wild guesses while completing the perception test with the target consonants. The participants managed to correctly identify, on average, more than 80% of the catch trials in the pre and the posttests. However, Table 3 also shows that one participant in the experimental group had great difficulty in identifying the catch trials with the target consonants (only 33% of correct responses) in the pretest (S18). Note that the catch trials with non-targets proved to be difficult for both the experimental and control groups in the pretest, but that in the posttest both groups improved their performance with the non-target catch trials. The considerable difficulty posed by the non-target catch trials was already expected because even the native speakers who listened to the perception test failed to perceive the contrast between the pair "Say cow now."/"Say cowl now." (see Appendix D).

6.2.2 Test design issues: Order effect in the perception test

An important consideration is whether the position in which the target odd item of each test token appeared affected the error rates in the perception test. The categorical discrimination test

2 A possible explanation for the lower percentages obtained for the catch trials containing non-target consonants is that the words used in these trials presented other sources of pronunciation difficulty for Brazilians, including the contrast between /r/ and /h/, /t/ and /tʃ/, and /l/ and /w/ (all pairs being allophones in some phonological contexts in BP).

included 24 sets[3] of three sentences each, which means that the token containing the odd item could appear in the first sentence (a), in the second sentence (b), or in the third sentence (c). It was expected that the position in which the target word appeared in the perception test had no influence on the scores of correct responses.

Tables 4 and 5 show that the odd targets that appeared in the "c" position tended to trigger the lowest error rates for both experimental and control groups in the pretest, but for the posttest, the 3 contexts yielded similar rates. This result suggests a possible drawback of the perception test design, which relied greatly on the participants' ability to hold in their memories three sentences for each set, and compare them in order to identify a subtle phonetic distinction. This drawback may have been less important in the posttest because of practice effect.

Table 4

Frequency of error per target position in the test token for the control group.

	Pretest				Posttest			
Positions	a	b	c	total	a	b	c	total
Errors	22	22	16	60	15	12	13	40
Targets tested	80	80	80	240	80	80	80	240
% of errors	(28)	(28)	(20)	(25)	(19)	(15)	(16)	(17)

3 As stated in Chapter 5, the perception test contained a total of 38 sets of sentences, but the remaining 14 sets were either catch trials or distracters.

Table 5

Frequency of errors per target position in the test token for the experimental group.

	Pretest				Posttest			
Positions	a	b	c	total	a	b	c	Total
Errors	44	42	26	112	21	26	19	66
Targets tested	96	96	96	288	96	96	96	288
% of errors	(46)	(44)	(27)	(39)	(22)	(27)	(20)	(23)

Friedman tests were run to verify whether the scores for the three positions were significantly different. The pretest results show no significant results for the control group, and a similar result was obtained for the control group's posttest. Regarding the experimental group, the Friedman test for pretest results showed that there was a significant difference. Wilcoxon post-hoc tests were run to locate these differences, yielding the following results: "a" versus "b" (p=.87), and "b" versus "c" (p=.08), "a" versus "c" (p=.03). In other words, a significant difference was found for words appearing in the first and last position within the triad, showing that, for the experimental group, the last position ("c") was significantly easier (lower percentages of errors). The Friedman test also revealed that the experimental group's posttest results were not significant for any of the comparisons. These results show that, in the pretest, only the experimental group had less difficulty with the "c" position than with the others, but that after receiving instruction, even the experimental group managed to obtain similar scores for the 3 positions. Thus, it seems that the target position played at least a weak role in the perception test scores, especially in the pretest.

6.2.3 Hypotheses 1 and 2: Pretest and posttest results

Hypotheses 1 stated that the experimental and control groups were similar before treatment in relation to the perception of the contrast between the CVC and CV.CV words. On the other hand, Hypothesis 2 predicted that instruction affected perception; thus, the experimental group's posttest scores were different from the control group's posttest scores.

Table 6 displays the results of the participants' performance on the perception test regarding test tokens with the target consonants. In the pretest, a comparison between the rates of correct responses of the control group (75%; M=18; SD=3.98) and the experimental group (61%; M=14.67; SD=4.25) shows that the former had greater efficiency discriminating between the CVC and CV.CV words than the latter. In Table 6, the results show that the control group (83%; M=20; SD=3.65) and the experimental group (77%; M=18.50; SD=5.30) performed better in the perception posttest than in the pretest, but the control group continued to perform better than the experimental group.

Table 6

Frequency of correct answers in the perception test with target consonants.

	Control Group							Experimental Group					
	Pretest	%	N	Posttest	%	n		Pretest	%	n	Posttest	%	N
S1	*9*	(38)	24	19	(79)	24	S11	15	(63)	24	24	(100)	24
S2	18	(75)	24	20	(83)	24	S12	16	(67)	24	19	(79)	24
S3	19	(79)	24	11	(46)	24	S13	12	(50)	24	24	(100)	24
S4	21	(88)	24	22	(92)	24	S14	17	(71)	24	18	(75)	24
S5	19	(79)	24	22	(92)	24	S15	11	(46)	24	19	(79)	24
S6	21	(88)	24	22	(92)	24	S16	11	(46)	24	*12*	(50)	24
S7	17	(71)	24	24	(100)	24	S17	20	(83)	24	22	(92)	24
S8	21	(88)	24	21	(88)	24	S18	10	(42)	24	15	(63)	24
S9	14	(58)	24	17	(71)	24	S19	15	(63)	24	16	(67)	24
S10	21	(88)	24	22	(92)	24	S20	17	(71)	24	22	(92)	24
							S21	9	(38)		*7*	(29)	
							S22	23	(96)		24	(100)	
Total	180	(75)	240	200	(83)	240		176	(61)	288	222	(77)	288
Mean	18			20				14.67			18.50		
SD	3.89			3.65				4.25			5.30		

Independent sample Mann-Whitney tests were used to compare the means of the two groups in the pretest and in the posttest. In the pretest, the results indicate that the experimental group performed considerably worse than the control group, and that the two groups were significantly different before the experiment began ($z=-1.88$; $p=.05$). This result rejects Hypothesis 1, showing that the two groups were already different before the experiment began. Regarding the posttest, the results show no significant difference between the two groups ($z=-.47$, $p=.63$). This result can be interpreted as a kind of improvement for the experimental group, whose performance on the posttest was relatively similar to the control group performance, contrary to the pretest results, in which the experimental group performance was significantly worse than the control group performance. This result suggests a possible positive effect of the pronunciation instruction provided to the experimental group, which might have helped them perceive the contrast between the target CVC and CV.CV words nearly as well as the control group. Nevertheless, the results also show that the control group obtained better scores in the posttest than in the pretest, thus suggesting that at least part of the improvement of both groups in the posttest might be due to additional confounding variables, such as task familiarity, and not only to instruction. Therefore, Hypothesis 2 could not be supported.

6.2.4 Hypothesis 3: Gain scores

In order to test whether there was a change in the scores in the perception test from the pretest to the posttest, the gain scores (posttest scores minus pretest scores) for each participant were calculated. Hypothesis 3 stated that there was a change in the scores for perception across tests, which was caused by pronunciation instruction.

The results displayed in Table 7 show that, in general, the experimental group yielded the highest gain scores; i.e., the participants of the experimental group were able to discriminate between the CVC and the CV.CV words more effectively in the posttest (M=3.83; SD=4.09) than in the pretest, compared to the control group (M=2; SD=4.55). However, an independent sample Mann-Whitney test showed no significant difference between the gain scores of the two groups (z=-.64; p=.52), thus rejecting Hypothesis 3. This result is probably influenced by the high standard deviations present in both groups, which highlight the influence of individual differences—a crucial factor in SLA classrooms and research.

As the data displayed in Table 7 show, only one participant in the control group (S1) and another in the experimental group (S13) managed to increase by 10 points or more their rates of correct responses in the perception posttest, while one participant of each group (S3, for the control group, and S21 for the experimental group) actually obtained negative rates. We can speculate that the better performance of the experimental group may be related to the pronunciation instruction they received. Nevertheless, most participants in the control group also improved their performance on the posttest, thus indicating that other factors might have influenced the posttest results (e.g., task familiarity, 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, and thus there was more room for improvement for the former than for the latter.

Table 7

Gain scores in the perception test.

Control Group		Experimental Group	
Participants	Score	Participants	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	2.0		3.83
SD	4.55		4.09
Maximum	10		12
Minimum	-8		-2

6.2.5 Hypothesis 4: Practiced versus non-practiced consonants

Owing to time constraints, only the target consonants /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, and /dʒ/ were included in the pronunciation material used for instruction with the experimental group, while the nasals were left out. Because BP has minimal

pairs such as r*im*/r*ime* "kidney"/"rhyme"[4] [xĩj]/[ˊximi] and *com*/*cone* "with"/"cone" [kõw]/[ˊkoni], the nasals /m/ and /n/ were not expected to cause difficulties at the perceptual level. Hypothesis 4 predicted that the consonants that were included in the pronunciation material (practiced consonants) used with the experimental group and the consonants that were not included in this material (non-practiced consonants) yielded different rates of correct responses in the experimental group's posttest.

Table 8 presents different totals for the 9 practiced consonants (those included in the pronunciation manual) and the 3 nasals, which were not practiced. The results show that the non-practiced sounds, that is, the nasals, tended to be the easiest consonants for the experimental and the control groups both in the pre and posttests. Furthermore, both groups obtained higher scores of correct responses with the non-practiced consonants in the posttest than in the pretest, but only the experimental group obtained considerably higher scores with the practiced consonants (from 58% in the pretest to 75% in the posttest), which might have been an effect of pronunciation instruction. As mentioned previously, the nasals /m/ and /n/ were expected to cause no difficulty, but this expectation was not fulfilled. The participants of both groups made errors with these nasals, which shows that even for cases in which the L1 has the word-final consonant (at least at the phonological level), the learners still have problems hearing this contrast, and this was especially the case with the experimental group.

Table 8

Frequency of correct responses in the perception test for practiced and non-practiced consonants.

4 Imperative and subjunctive (present), second person (singular), and second and third persons (singular), respectively.

	Control Group							Experimental Group					
	Pretest	%	N	Posttest	%	n		Pretest	%	n	Posttest	%	n
p	13	(65)	20	16	(80)	20	p	13	(54)	24	17	(71)	24
b	17	(85)	20	17	(85)	20	b	22	(92)	24	21	(88)	24
t	13	(65)	20	15	(75)	20	t	10	(42)	24	17	(71)	24
d	18	(90)	20	17	(85)	20	d	16	(67)	24	18	(75)	24
k	16	(80)	20	17	(85)	20	k	12	(50)	24	21	(88)	24
g	18	(90)	20	19	(95)	20	g	20	(83)	24	18	(75)	24
f	15	(75)	20	17	(85)	20	f	15	(63)	24	21	(88)	24
v	12	(60)	20	13	(65)	20	v	11	(46)	24	17	(71)	24
dʒ	5	(25)	20	12	(60)	20	dZ	7	(29)	24	12	(50)	24
Total practiced	127	(71)	*180*	143	(79)	*180*		*126*	(58)	*216*	162	(75)	*216*
Mean	14.11			15.89				14.00			18.00		
SD	4.08			2.20				4.8			2.87		
m	19	(95)	20	19	(95)	20	m	13	(54)	24	18	(75)	24
n	18	(90)	20	19	(95)	20	n	19	(79)	24	21	(88)	24
ŋ	16	(80)	20	19	(95)	20	N	18	(75)	24	21	(88)	24
Total non-practiced	53	(88)	60	57	(*95*)	60		*50*	(69)	*72*	60	(83)	*72*
Mean	17.67			19.00				16.67			20.00		
SD	1.53			0				3.21			1.73		
General total	180	(75)	240	200	(*83*)	240		176	(61)	288	222	(77)	288

Sample-related Wilcoxon signed ranks tests were run to compare the means of practiced and non-practiced consonants within groups in the pre and posttests. For the control group, the results show no significant differences (pretest and posttest: z=-1.60, p=.10). The same test was run for the experimental group, and again no significant differences were found (pretest: z=-.44, p=.65; posttest: z=-1.34, p=.18). Independent Mann-Whitney tests were run to obtain across group comparisons of practiced and non-practiced consonants in the pre and posttests. The pretest results were not significant for both practiced (z=-.44, p=.65) and non-practiced consonants (z=.22, p=.82), thus showing that the experimental and control groups performed similarly. The posttest results for the practiced consonants were significant (z=-1.91, p=.05), which indicates that the experimental group performed better than the control group. For the non-practiced consonants, the posttest results reached no significance (z=-.70, p=.48). These results support Hypothesis 4, since they show that pronunciation instruction affected significantly the learning of the practiced consonants.

6.2.6 Summary of the perception test results

In summary, the perception test results indicate that both groups had some difficulty in discriminating between CVC and CV.CV words in the pretest. However, the two groups were already significantly different at the beginning of the study, since the experimental group obtained much lower rates of correct responses for the perception test in the pretest than the control group. This difference in performance makes it difficult to interpret the posttest results, in which both the experimental and the control groups improved their rates of correct responses. The apparently better rates obtained by the experimental group in the posttest compared to their pretest might be related to the pronunciation instruction they received. However, a possible

interpretation is that the experimental group improved more than the control group because the former had more room for change in the pretest scores. The results also show that pronunciation instruction helped the experimental group obtain significantly better rates with the practiced consonants in the posttest than the control group, and that both groups had difficulties discriminating between CVC and CV.CV words even in contexts where this contrast exists in the L1.

6.3 Production test

The second instrument used to collect data was the production test, which consisted of a set of sentences containing words with the 12 target consonants. The participants recorded these sentences at two different times (pre and posttests). The target words were later transcribed (see Appendices in Silveira, 2004) in order to identify the strategies the participants resorted to when they had to pronounce monosyllabic words containing word-final consonants that do not occur in this position in their L1. Pre and posttest transcriptions were compared to verify whether pronunciation instruction could contribute to the acquisition of these word-final consonants.

The analysis of the production test data begins with a discussion about the syllable simplification processes found in the production of word-final consonants by the informants, with emphasis on vowel paragoge. Next, results concerning three variables that might have influenced the results are presented, namely: (a) The following environment, (b) orthography, and (c) word frequency. The following sections focus exclusively on the use of paragoge in the production of word-final consonants and how it interacts with pronunciation instruction. The following hypotheses guided the data analysis for the production test:

Hypothesis 5:
The environment following the target consonants in the production test influences the paragoge rates.

Hypothesis 6:
The paragoge rates of the words that end in a consonant followed by <e> are different from the rates of the words ending in a grapheme consonant only.

Hypothesis 7:
The paragoge rates of real words are different from the nonsense word rates.

Hypothesis 8:
The experimental and the control groups are similar before treatment in relation to the production of word-final consonants.

Hypothesis 9:
Instruction influences production, thus the experimental group's posttest scores are different from their pretest scores and different from the control group's posttest scores.

Hypothesis 10:
There is a change in the scores of the production of word-final consonants across tests, caused by pronunciation instruction (gain scores).

Hypothesis 11:
The consonants that were included in the pronunciation material (practiced consonants) used with the experimental group and the consonants that were not included in this material (non-practiced consonants) yield different rates of correct responses in the experimental group's posttest.

6.3.1 Strategies of syllable simplification

Data analysis showed that vowel paragoge was the only strategy of syllable simplification used by the participants in the production of all word-final consonants, except for the nasals /m/ and /n/ ending in a consonantal grapheme (control group: pretest=18%, posttest=21%; experimental group: pretest=45%, posttest=30%).

Table 9

Frequency of paragoge in the production test.

	Control Group		Experimental Group	
	Pre	Post	Pre	Post
Total %	128 (18)	149 (21)	373 (45)	250 (30)
Mean per consonant	9.54	15.0	5.54	5.04
SD	1.3	1.86	1.85	2.0
N*	702	704	827	824

Note: The means were obtained by multiplying the number of tokens for each target consonant by the number of occurrences of paragoge for that consonant. The products were then added together and the sum was divided by the total number of tokens for all target consonants.

* The reason for different N values in the pre and posttests in most tables for the production test is that a few participants either misread target words or missed entire sentences.

Other syllable simplification strategies employed by the participants were deletion, substitution, and devoicing. Deletion with assimilation of the nasal feature to the preceding vowel with the bilabial and alveolar nasals not followed by the silent <e> (e.g., “room” and “clean”), and the substitution of

[ŋg] for /ŋ/ were categorical (nearly 100%), owing to L1 and spelling interference.

Table 10 shows the results regarding other types of substitution motivated by the participants' L1. Substitution, generally combined with paragoge, was also very common with the alveolar stops and the voiced alveopalatal affricate. The sounds /t/ and /d/ were frequently pronounced as [tʃ] or [ts] and [dʒ] or [dz], respectively; and /dʒ/ was pronounced as [ʒ]. The pronunciation of /t/ and /d/ as affricates (palatalization) is an L1 phonological process found in many Brazilian Portuguese dialects, while the allophones [ts] and [dz] are becoming more frequent in the dialect spoken by people from Florianópolis and some nearby cities. The deletion of nasal consonants with assimilation of the nasal feature to the preceding vowel and the pronunciation of /dʒ/ as [ʒ] result from transfer of L1 spelling rules, and the substitution of [ŋg] for /ŋ/ indicates a lack of knowledge of the English spelling rules which say that <g> is not pronounced in certain contexts in standard dialects.

Table 10

Frequency of substitution (for the consonants /t/, /d/, and /dʒ/, with frequent and nonsense words).

	Control Group		Experimental Group	
	Pretest	Posttest	Pretest	Posttest
Total	78	81	139	124
Percentage	(29)	(30)	(43)	(38)
N	270	270	324	324

Table 11 compares the rates of paragoge and devoicing for the 4 voiced obstruents: /b/, /d/, /g/, and /v/[5]. There were only a few

5 The sound /dʒ/ was excluded because its voiceless counterpart /tʃ/ was not tested .

instances of devoicing for both the experimental group (pretest=3%, posttest=3%) and the control group (pretest=4%, posttest=2%).

Table 11

Frequency of paragoge and devoicing for /b/, /d/, /g/, and /v/ (with real words only).

Control Group					Experimental Group			
	Pretest		Posttest		Pretest		Posttest	
	Paragoge	Devoicing	Paragoge	Devoicing	Paragoge	Devoicing	Paragoge	Devoicing
Total	28	7	32	4	91	6	66	7
%	(16)	(4)	(18)	(2)	(45)	(3)	(33)	(3)
Mean	4.07	1.08	4.80	.57	14.05	.55	10.19	.92
SD	1.22	.30	1.39	.18	3.53	0.26	2.57	0.29
N	176	176	176	176	204	204	201	201

Note: The means were obtained by multiplying the number of tokens for each target consonant by the number of occurrences of paragoge for that consonant. The products were then added together and the sum was divided by the total number of tokens for all target consonants.

The nonsense words were responsible for several cases of misreading and devoicing, as well as voicing of two consonants (/k/ and /t/). In the control group, the consonant /k/ was voiced 5 times in the pretest and 5 in the posttest with the nonsense word “gock”, and /t/ was voiced once in the pretest, and once in the posttest with the nonsense word “pite”. The literature has frequently discussed devoicing as a syllable simplification strategy commonly found in the interphonology of learners’

of certain L1 backgrounds (e.g., Flege & Davidian, 1984; Weinberger, 1987; Yavas, 1997). However, voicing, to my knowledge, has not been suggested as a frequent syllable simplification strategy in SLA. The fact that voicing occurred with nonsense words might only reflect reading difficulties the participants had with these words.

6.3.2 Hypothesis 5: The following environment in the production test

Hypothesis 5 predicted that the environment following the target consonants in the production test influenced the paragoge rates. The results displayed in Tables 12 and 13 shed some light on the way the phonological environment surrounding word-final consonants affected their production. The tables show that, in the pretest for both groups, the context _#V yielded slightly higher paragoge rates than the contexts _# and _#C. For the posttest, the control group obtained the highest paragoge rates in the _# and _#V contexts. The experimental group obtained similar results for the three contexts, with slightly higher scores for the _# and _#V contexts. The results indicate that, in the posttest, the experimental group's rates of paragoge dropped considerably in all of the three contexts, practically neutralizing the difference between the contexts. However, the control group's rates increased slightly and only the contrast between _# and _#V was neutralized.

Table 12

Control group's frequency of paragoge according to target consonants and their following contexts.

	Pretest				Posttest			
	_#	_#V	_#C	total	_#	_#V	_#C	total
Paragoge	42	54	32	128	58	55	36	149
Targets tested	234	235	233	702	235	233	236	704
%	(18)	(23)	(14)		(25)	(24)	(15)	

Note: _#: pause context ; _#V: vowel context; _#C: consonant context.

Table 13

Experimental group's frequency of paragoge according to target consonants and their following contexts.

	Pretest				Posttest			
	_#	_#V	_#C	total	_#	_#V	_#C	total
Paragoge	*129*	132	112	373	86	85	79	250
Targets tested	275	277	275	827	276	274	274	824
%	(47)	(48)	(41)		(31)	(31)	(29)	

Note: _#: pause context ; _#V: vowel context; _#C context.

Friedman tests were run to compare the results for each group, taking into account the different phonological contexts in the pre and posttests. The results indicated significant differences for the control group both in the pre and the posttest. Paired-sample Wilcoxon signed rank tests were run to compare the scores of each of the following environments in the pre and posttest data for the control group. Pretest results show that the comparisons _# versus _#V, and _# versus _#C were not significant (p=.30 for both), but that the comparison _#V versus _#C was significant (p=.05). The control group posttest yielded no significant differences for the comparison _# versus _#V (p=.51), but the comparisons _# versus

_#C, and _# V versus _#C were significant (p=.02 and p=.007, respectively). Regarding the experimental group, both pre and posttest results reached no significance. These results indicate that the environment _#C was indeed easier than the others for the control group only, thus partially supporting Hypothesis 5.

The control group results are contrary to Baptista and Silva Filho's (1997), since in their study the context _#C was found to yield the highest paragoge rates. However, this result corroborates Koerich (2002), who found no clear tendencies, which she attributed to the proficiency level of the participants. Moreover, these results partially support Silveira (2002a), in which the context _#C was considerably easier than the others. A possible explanation for these results might be the different test designs used in these studies. Furthermore, as Koerich (2002) observed, beginners produce paragoge with such frequency that the results regarding the following environment become almost random.

6.3.3 Hypothesis 6: Orthography in the production test

Hypothesis 6 stated that the paragoge rates of the words ending in a consonant followed by <e> were different from the rates of the words ending in a grapheme consonant only. Table 14 displays the frequency of paragoge in relation to orthography by including only the consonants that were tested in the two contexts: a target word ending with a consonantal grapheme (e.g., *mad*) and a target word ending in the same grapheme followed by a silent <e> (e.g., *made*). A total of eight consonants appeared in both contexts: /p/, /b/, /t/, /d/, /k/, /f/, /m/, and /n/, but only the first six were tested. The last two had to be excluded due to the almost categorical use of the deletion/assimilation strategy with the nasals that were not followed by a silent <e>. The sounds /t/, /d/, /k/ were also tested with nonsense words, but these tokens were also left out of this analysis, and will be examined later in the section (6.3.4) that discusses the influence of the variable lexical knowledge.

Table 14

Frequency of paragoge in relation to orthography.

	C-pre	n	Ce-pre	n	C-post	n	Ce-post	n
Control	19	176	40	178	23	175	43	180
%	(11)		(22)		(13)		(24)	
Exper	83	212	101	211	63	211	66	212
%	(39)		(48)		(30)		(31)	

Note: C: words ending in a consonantal grapheme; Ce: words ending in a silent <e>.

The results indicate that the orthography factor plays an important role in the frequency of paragoge in the production of word-final consonants by Brazilian learners of English. For both the experimental and the control groups, it is clear that the words containing the silent <e> triggered more paragoge than those ending in the consonantal grapheme, thus supporting Hypothesis 6. In the posttest, the control group increased their rates slightly in both contexts. As for the experimental group, there was a reduction in the paragoge rate in the words ending in consonantal graphemes and those ending in the same grapheme followed by a silent <e>, so that the difference between them was neutralized in the posttest.

Sample-related Wilcoxon signed rank tests were run to compare, within groups, the means of words ending in a consonantal grapheme and those ending in the same grapheme followed by a silent <e>, in the pre and posttests. For the control group, the results were significant for the pretest ($z=-1.93$, $p=.05$) and the posttest ($z=-2.49$, $p=.01$), that is, the words with a silent <e> were significantly more difficult than the words ending in a consonantal grapheme in the pre and posttests. The same statistical tests were run for the experimental group, and significant differences were found for the pretest ($z=-2.45$,

p=.02), but not for the posttest (z=-2.06, p=.82). These results show that only the experimental group managed to improve their performance on the consonants ending in a silent <e>, so that in the posttest the paragoge rates for these words were not significantly different from those of the words ending in a consonantal grapheme. Thus, the experimental group neutralized the difference between these two types of words in the posttest, which indicates that pronunciation instruction has diminished the effects of orthography on the production of word-final consonants. It is important to point out that the pronunciation material used with the experimental group explicitly addressed the fact that the final <e> should not be pronounced in English.

6.3.4 Hypothesis 7: lexical knowledge in the production test

In order to test for the effect of lexical knowledge on the production of word-final consonants, the production test included both real or nonsense words. The real words were cognates or words thought to be frequent in beginning textbooks (e.g., club, room). For this analysis, only the consonants /t/, /d/, and /k/ were considered, since these were the only sounds tested with both real and nonsense words. Hypothesis 7 stated that the paragoge rates of real words were different from the nonsense word rates.

Table 15 shows that the real words triggered higher paragoge rates than the nonsense words for both the experimental and the control groups in the pre and posttests. Sample-related Wilcoxon signed rank tests were run to compare the means of frequent and nonsense words in the pre and posttests, within-groups. For the control group, the results were significant for the pretest (z=-2.80, p=.05) and the posttest (z=-2.80, p=.05). The same test was run for the experimental group, and again, significant differences were found for the pretest (z=-3.05, p=.002) and posttests (z=-3.06, p=.002).

Table 15

Frequency of paragoge in relation to the effect of real/nonsense words.

	Control Group				Experimental Group			
	Pre		Post		Pre		Post	
	frequent	Nonsense	frequent	nonsense	frequent	nonsense	frequent	Nonsense
Total	46	24	48	31	*110*	*84*	*84*	*48*
%	(27)	(14)	(28)	(18)	(53)	(41)	(41)	(23)
N	173	173	173	175	208	206	205	208

Therefore, lexical knowledge was shown to influence the production of word-final consonants, thus supporting Hypothesis 7. Pronunciation instruction helped the experimental group to reduce the paragoge rates with both types of words, but the reduction was more effective with the nonsense words than with the real words. A possible explanation for the fact that the nonsense words triggered lower paragoge rates is that the participants simply concentrated more to pronounce them because they were unknown vocabulary items.

These results suggest that, as proposed by Flege (1987) and Baptista (1995), at the initial stages of language acquisition learners lack automatized phonological processes and tend to use the L1 processes as default. Thus, the lexical items that are acquired at this stage are likely to be more resilient to changes than the new lexical items that learners encounter later. This raises the problem mentioned by Baptista (1995), who observed that if L2 learners continue to resort to the L1 phonological processes for a long time, the chances are that this procedure will become automatized, even for cases where the L1 phonological parameters are inadequate for the L2. These results also reinforce the fact that pronunciation instruction should be a priority at the initial stages of L2 learning.

6.3.5 Hypotheses 8 and 9: Pre and posttest results

Hypothesis 8 stated that the experimental and the control groups were similar before treatment in relation to the production of word-final consonants. On the other hand, Hypothesis 9 predicted that instruction influenced production, thus the experimental group's posttest scores were different from their pretest scores and different from the control group's posttest scores.

Table 16 displays the results regarding the participants' performance on the production test, with a focus on the most frequent syllable simplification strategy—paragoge. A comparison between the rates of error in the pretests of the experimental and the control groups shows that the former yielded higher paragoge rates (45%; M=31.08; SD=14.40) than the latter (18%; M=12.80; SD=8.28). Regarding the posttest, the experimental group reduced considerably the paragoge rates (30%; M=20.83; SD=9.69), whereas the control group (21%; M=14.90; SD=11.08) actually obtained slightly higher paragoge rates.

Table 16

Frequency of paragoge in the production test per participant.

Control Group								Experimental Group							
	Pretest	%	N	Posttest	%	n			Pretest	%	n	Posttest	%	n	
S1	25	(32)	77	40	(53)	75		S11	23	(32)	75	14	(19)	73	
S2	3	(4)	78	5	(6)	78		S12	28	(36)	74	20	(26)	77	
S3	27	(36)	76	29	(38)	77		S13	18	(24)	77	11	(14)	76	
S4	4	(5)	74	13	(17)	76		S14	46	(59)	77	31	(40)	78	
S5	12	(15)	78	11	(14)	78		S15	34	(45)	75	23	(31)	75	
S6	7	(9)	76	6	(8)	78		S16	22	(31)	70	17	(24)	72	
S7	15	(19)	77	12	(16)	74		S17	42	(56)	73	23	(31)	75	
S8	11	(14)	78	12	(16)	77		S18	53	(79)	74	30	(45)	67	
S9	17	(23)	75	14	(19)	75		S19	44	(57)	77	34	(44)	77	
S10	7	(10)	73	7	(9)	76		S20	26	(34)	76	14	(18)	77	
								S21	36	(48)	76	31	(41)	75	
								S22	1	(1)	75	2	(3)	77	
Total	128	(18)	702	149	(21)	704			373	(45)	827	250	(30)	824	
Mean	12.80			14.90					31.08			20.83			
SD	8.28			11.08					14.40			9.69			

Independent Mann-Whitney tests were used to compare the means of both groups in the pretest and in the posttest. The pretest results indicate that the two groups were already different before the experiment began (z=-2.77; p=.006), thus rejecting Hypothesis 8. Although the paragoge rates of the experimental

group continued to be higher than the control group rates in the posttest, the difference between the two groups was no longer significant (z=-1.75, p=.08), and only the experimental group managed to reduce the rates. This result suggests a positive effect of pronunciation instruction, but it is not sufficient to support Hypothesis 9.

6.3.6 Hypothesis 10: Gain scores

In order to test whether there was a change in the scores of the production test from the pretest to the posttest, the gain scores (posttest scores minus pretest scores) for each participant were calculated. Hypothesis 10 stated that there was a change in the scores of the production of word-final consonants across tests, caused by pronunciation instruction. The results displayed in Table 17 show that, in general, the experimental group obtained higher gain scores; i.e., they tended to resort less frequently to vowel paragoge to produce the target words in the posttest (M=-10.25, SD=6.50) than in the pretest, compared to the control group (M=2.10; SD=5.69). Furthermore, an independent sample Mann-Whitney test showed that the difference between the gain scores of the two groups was highly significant (z=-3.60; p=.0001). All in all, these findings indicate that the pronunciation instruction provided to the experimental group might have helped the participants in this group to resort less frequently to v while producing certain types of word-final consonants, thus confirming Hypothesis 10.

Table 17

Gain scores for the production test.

Control Group		Experimental Group	
Participants	Score	Participants	Score
S1	15	S11	-9
S2	2	S12	-8
S3	2	S13	-7
S4	9	S14	-15
S5	-1	S15	-11
S6	-1	S16	-5
S7	-3	S17	-19
S8	1	S18	-23
S9	-3	S19	-10
S10	0	S20	-12
		S21	-5
		S22	1
Total	21		-123
Mean	2.10		-10.25
SD	5.69		6.50
Maximum	-3		-23
Minimum	15		1

Although the tendency for paragoge reduction was more common in the experimental group than in the control group, it should be pointed out that 4 participants in the control group also managed to reduce their paragoge rates in the posttest, although minimally. Furthermore, one participant from the experimental group (S22) did not improve his performance in the posttest, which can be explained by the fact that this

participant obtained the lowest paragoge rate in the pre test (only 1 case of paragoge), and there was not much room for improvement in the posttest.

As the data displayed in Table 17 show, 50% of the participants in the experimental group (S14, S15, S17, S18, S19, and S20) managed to reduce by 10 points or more their paragoge rates in the perception posttest. On the other hand, 50% of the participants in the control group (S1, S2, S3, S4, and S8) actually increased their paragoge rates. Therefore, it seems that the improvement of the experimental group was far more impressive, thus suggesting that the pronunciation instruction provided tended to help them to resort less often to vowel paragoge when pronouncing words ending in the target consonants.

6.3.7 Hypothesis 11: Practiced versus non-practiced consonants

As mentioned in Section 6.2.5, only the consonants /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, and /dʒ/ were included in the pronunciation material used with the experimental group, while the nasals were left out. The bilabial and alveolar nasals ending in a consonantal grapheme (e.g., "clean") triggered a different syllable simplification strategy, namely, deletion of the nasal consonant and assimilation of the nasal feature to the preceding vowel. For this reason, the data analysis in this section focused exclusively on the target words ending in a silent <e> (e.g., *same*, *tape*), while the target words ending in a consonantal grapheme were left out. The analysis also excluded the 3 consonants that were tested with nonsense words. Thus, Table 18 displays the results only for the 8 practiced consonants and the 2 nasals whose target words (a) ended in a silent "e", and (b) were frequent words. Hypothesis 11 stated that the consonants that were included in the pronunciation material (practiced consonants) used with the

experimental group and the consonants that were not included in this material (non-practiced consonants) yielded different rates of correct responses in the experimental group's posttest.

The results (Table 18) show that the non-practiced consonants tended to be the most difficult consonants for the control group in the pretest (28%) and in the posttest (41%). The experimental group obtained similar results in the pretest (59%) and the posttest (46%). Thus, the practiced consonants yielded the lowest paragoge rates in both the pretest (21%) and the posttest (21%) in the control group, as well as in the experimental group (pretest=48%; posttest=30%). These results were unexpected because the non-practiced consonants are nasals and the practiced ones are obstruents. In principle, nasals should be less marked in word-final position than obstruents (Tropf, 1987; Eckman & Iverson, 1994); thus, the former should trigger lower paragoge rates than the latter. In the posttest, the paragoge rates for the non-practiced consonants increased in the control group, whereas the practiced consonants continued to yield paragoge rates similar to the pretest. For the experimental group, however, there was a considerable decrease in the paragoge rates for both practiced and non-practiced consonants.

Table 18

Frequency of paragoge *for practiced and non-practiced consonants* for the production test.

	Control group						Experimental Group					
	Pretest	%	N	Posttest	%	n	Pretest	%	n	Posttest	%	N
p	7	*23*	30	7	*23*	30	12	*34*	35	11	*31*	35
b	0	*0*	29	3	*10*	30	16	*44*	36	7	*20*	35
t	2	*7*	29	6	*20*	30	18	*51*	35	7	*20*	35
d	8	*27*	30	6	*20*	30	14	*39*	36	10	*28*	36
k	19	*63*	30	18	*60*	30	27	*79*	34	27	*79*	34
f	4	*13*	30	3	*10*	30	14	*39*	36	4	*11*	36
v	7	*23*	30	5	*17*	30	21	*58*	36	13	*38*	34
dʒ	4	*13*	30	3	*10*	30	14	*41*	34	5	*15*	34
Total practiced	51	*21*	238	51	*21*	240	136	*48*	282	84	*30*	279
Mean	6.38			6.38			17			10.5		
SD	5.78			4.96			4.93			7.33		
m	10	*33*	30	14	*47*	30	24	*69*	35	18	*53*	34
n	7	*23*	30	11	*37*	30	18	*50*	36	13	*38*	34
Total non-Practiced	26	*28*	60	34	*41*	60	42	*59*	71	31	*46*	68
Mean	8.5			12.50			21			15.5		
SD	2.12			2.12			4.24			3.54		

Sample-related Wilcoxon signed rank tests were run to compare the means of practiced and non-practiced consonants within groups in the pre and posttests. For the control group, the results showed no significant differences for the pre and posttests (z=-1.34, p=.18). The same test was run for the experimental group, and again, no significant differences were found for the

pre and posttests (z=-1.34, p=.18). Across-group comparisons were obtained with Mann-Whitney independent sample tests for practiced and non-practiced consonants in the pre and posttests. The pretest results were significant for practiced consonants (z=-2.74, p=.006), but not significant for non-practiced consonants (z=-1.54, p=.12), thus showing that the experimental group obtained much higher paragoge rates with the practiced consonants than the control group in this test. The posttest results for the practiced consonants were no longer significant (z=-1.74, p=.08), which indicates that the experimental group managed to reduce the paragoge rates in this test, thus performing similar to the control group. This result can be interpreted as an improvement of the experimental group. For the non-practiced consonants, the posttest results reached no significance (z=-.77, p=.43), which indicates that the two groups continued to obtain similar paragoge rates with these consonants. These results confirm Hypothesis 11, since they show that pronunciation instruction had a significant effect on the learning of the practiced consonants.

Further support for Hypothesis 11 was found in the percentages and the means of the experimental and the control groups, displayed in Table 18. These results indicate a positive effect of pronunciation instruction, which seems to have helped the experimental group improve their performance on the practiced consonants in the posttest. Moreover, the fact that the experimental group also improved their performance on the non-practiced consonants suggests that they were able to generalize the information they received about the contrast between CVC and CV.CV words to contexts that were not explicitly dealt with in the classroom. The fact that the experimental and control groups were already different at the beginning of the experiment makes it difficult to verify whether the experimental group performed better with the practiced consonants than the control group in the posttest.

6.3.8 Summary of the production test results

In Section 6.3, the results of the production test have been presented. In general, a positive effect for pronunciation instruction was found. This effect was greater at the production level than at the perception level (see Section 6.2.3), which might be due to test design variables, as well as to the fact that, as suggested by Flege, Bohn and Jang (1997), exposure to the L2 has a greater effect on production than on perception. The variables of orthography (silent <e>) and lexical knowledge contributed to high paragoge rates in both the pre and posttests of the control group, and the posttest of the experimental group, which indicates that these variables play a major role in the acquisition of word-final consonants by beginning Brazilian learners. It is important to point out that pronunciation instruction seems to have helped the experimental group to considerably reduce paragoge rates with word-final consonants in the posttest with both practiced and non-practiced consonants, thus suggesting that pronunciation instruction can be generalized to contexts that are not explicitly addressed by the pronunciation material.

6.4 Hypothesis 12: Correlations between the perception and production tests

The aim of this section is to compare the scores in the perception and production pretest and posttest for the control and the experimental groups. The hypothesis guiding this analysis states that there is an interaction between the perception and production pretests, as well as between the perception and production posttests. This hypothesis was assessed with the help of Bivariate Spearman correlations, which were run for the control and the experimental groups.

For the control group, the perception pretest scores were not significantly correlated with the production pretest scores (r=-.57; p=.08), and a similar result was obtained for the perception posttest scores, which were not significantly correlated with the production posttest scores (r=-.49; p=.14). Regarding the experimental group, no significant correlation was found for the perception pretest scores and the production pretest scores (r=-.19; p=.54). But the perception posttest scores were significantly correlated with the production posttest scores (r=-.76; p=.005).

All the interactions between the perception and the production tests for the control and the experimental groups were negative, thus indicating that the lower the rates of correct responses in the perception test, the higher the frequency of paragoge in the production test. This tendency is supported by the performance of each participant on the perception and production tests in terms of rank position (see Table 19).

Table 19

Rank position for the perception and production tests (1 means the best score).

	Perception pre	Perception post	Production pre	Production post
Control Group				
S1	10	8	9	10
S2	7	7	1	1
S3	5,5	10	10	9
S4	2,5	4	2	7
S5	5,5	4	6	4
S6	2,5	4	3	2
S7	8	1	7	5,5
S8	2,5	4	5	5,5
S9	9,	9	8	8
S10	2,5	4	3,5	3
Experimental Group				
S11	6,5	2	4	3
S12	5	6,5	6	6
S13	8	2	2	2
S14	3,5	8	11	10,5
S15	9,5	6,5	7	7,5
S16	9,5	11	3	5
S17	2	4,5	9	7,5
S18	11	10	12	9
S19	6,5	9	10	12
S20	3,5	4,5	5	3,5
S21	12	12	8	10,5
S22	1	2	1	1

The analysis of the interactions between perception and production partially supports Koerich (2002), who found that the participants who obtained the highest correct discrimination scores in the perception test tended to obtain the lowest paragoge rates in the production test. The control group showed no clear relationship between perception and production in the pretest

and in the posttest. On the other hand, there was no significant relationship between the perception and production pretests for the experimental group, but there was a significant one in the posttest, which seems to indicate that the pronunciation materials had an approximately equal effect on both perception and production.

6.5 Markedness Variables

Markedness has been proposed as an important factor in the acquisition of syllable structure (e.g., Eckman, 1987; Eckman & Iverson, 1994; Yavas, 1994; Baptista & Silva Filho). In the present study, the following markedness variables were taken into account: (a) sonority, (b) voicing, and (c) place of articulation. The analysis in this section was oriented by the following hypotheses:

Hypothesis 13:
Sonority affects the perception and the production of word-final consonants.

Hypothesis 14:
Voicing affects the perception and the production of word-final consonants.

Hypothesis 15:
Place of articulation affects the production of word-final consonants.

Regarding sonority, the production data collected allow the comparison between the degree of difficulty posed by the nasals (/m/ and /n/)[6] and the following obstruents: an affricate (/

6 For the category nasals, only the target words ending in a silent "e" were included, due to the fact that the participants systematically employed the deletion/assimilation strategy with the other target words ending in consonantal graphemes.

dʒ/), fricatives (/f/ and /v/), and stops (/p/, /b/, /t/, /d/, and /k/). As for the perception data, the analysis included the 3 nasals tested (/m/, /n/, and /ŋ/), and all the obstruents included in the production test analysis, plus /g/. Note that the nasals are more sonorous and the obstruents less sonorous. Tropf (1987) and Eckman and Iverson (1994) propose that less sonorous consonants are more marked (and thus more difficult) in final position than more sonorous ones.

As for voicing, due to test design restrictions, only the following pairs of voiced/voiceless consonants could be compared for the production test: /b/~/p/, /d/~/t/, and /v/~/f/. The perception test included the same pairs, plus /g/ and /k/. Several interphonology studies dealing with word-final consonants have indicated that voiced consonants are more marked than voiceless ones (e.g., Eckman, 1987; Tropf, 1987; Baptista & Silva Filho, 1997). Nevertheless, Silveira (2002a) and Koerich (2002) found no clear tendencies concerning the markedness of voiced consonants in relation to voiceless ones.

The variable place of articulation was analyzed for the production test only, and the dataset allows the comparison between the following natural classes of stops: bilabials (/p/ and /b/), alveolars (/t/ and /d/), and one velar (/k/). Yavas (1994) proposed that the velars are the most difficult consonants, while the bilabials are the easiest ones. These predictions were corroborated by Baptista and Silva Filho (1997) and Koerich (2002), and partially confirmed by Silveira (2002a)

Tables 20 and 21 show the frequency of correct responses in the perception tests and the production tests, respectively, in relation to sonority, voicing, and place of articulation (only Table 21). For the production test analysis, only the target words ending in a silent <e> (e.g., *same*, *tape*) were included, while the target words ending in a consonantal grapheme were left out. The analysis also excluded the 3 consonants that were tested with nonsense words. Only rates and percentages will

be used to discuss the results concerning markedness variables. The results displayed in Tables 19 and 20 will be discussed in the following sections.

Table 20

Frequency of correct responses in relation to the natural classes in the perception test.

	Control Group			Experimental Group		
	Pretest	Posttest	n	Pretest	Posttest	n
Voiced obstruents	65	66	80	69	74	96
	(81)	(83)		(72)	(77)	
Voiceless obstruents	57	65	80	50	76	96
	(71)	(81)		(52)	(79)	
Nasals	53	57	60	50	60	72
	(88)	(95)		(69)	(83)	
Obstruents	127	143	180	126	162	216
	(71)	(79)		(58)	(75)	

Note: Percentages in parentheses.

Table 21

Frequency of paragoge in relation to the natural classes in the production test.

	Control Group				Experimental Group			
	Pre	n	post	n	pre	n	post	n
Voiced obstruents	15	89	14	90	51	108	30	105
	(17)		(16)		(47)		(29)	
Voiceless Obstruents	13	89	16	90	44	106	22	106
	(15)		(18)		(42)		(21)	
Obstruents	28	178	30	180	95	214	52	211
	(16)		(17)		(44)		(25)	
Nasals	26	90	34	90	54	102	40	102
	(29)		(38)		(53)		(39)	
Bilabials	7	59	10	60	28	71	18	70
	(12)		(17)		(39)		(26)	
Alveolars	10	59	12	60	32	71	17	71
	(17)		(20)		(45)		(24)	
Velar	19	30	18	30	27	34	27	34
	(63)		(60)		(79)		(79)	

Note: Percentages in parentheses.

6.5.1 Hypothesis 13: Sonority in the perception and production tests

Hypothesis 13 stated that sonority affected perception and the production of word-final consonants. In the perception test (Table 20), the comparison between the most sonorous (nasals) and the least sonorous (obstruents) corroborates Tropf's (1987) and Eckman and Iverson's (1994) claim, since the nasals obtained higher rates of correct responses than the obstruents, for both the control and the experimental groups in the pre and posttests. In

other words, the most sonorous were easier than the least sonorous consonants. These results offer support to Hypothesis 13.

Regarding the production test (Table 21), the results challenge Tropf's (1987) and Eckman and Iverson's (1994) claim and support Yavas' (1994). In the pre and posttests of the control and the experimental groups, higher paragoge rates were obtained for the nasals than for the obstruents, thus indicating that markedness regarding sonority was not the most important factor here. Maybe the fact that all words included in this analysis had the silent <e> influenced the results, as the informants had a mental representation for the words with a final vowel sound. Nevertheless, these results offer further support to Hypothesis 13.

6.5.2 Hypothesis 14: Voicing in the perception and production tests

Hypothesis 14 predicted that voicing affected the perception and the production of word-final consonants. In the perception test (Table 20), the pretest results of the control group and the experimental groups showed that the voiced consonants yielded higher rates of correct responses, which indicates that voiceless consonants pose more difficulty for perception. On the other hand, the posttests of both groups yielded extremely similar error rates for voiced and voiceless consonants, thus suggesting that no natural class poses more difficulty than the other once the informants are more familiar with the test format. Overall, the perception test results corroborate Koerich's (2002) findings that there is no clear pattern for the role of voicing in the production of word-final consonants, and the pretest results offer partial support to Hypothesis 14.

In the production test (Table 21), corroborating what is suggested in the interphonology literature (e.g., Eckman, 1987; Tropf, 1987), the voiced consonants tended to trigger more paragoge than the voiced ones for the experimental group.

However, for the control group, the paragoge rates for both categories were very similar, which suggests that markedness concerning voicing plays a minor role in the production of word-final consonants by Brazilians (Keorich, 2002). The results for the experimental group offer partial support to Hypothesis 14.

6.5.3 Hypothesis 15: Place of articulation in the production test

Hypothesis 15 stated that place of articulation affected the production of word-final consonants. The production test results partially support Yavas' (1994) claim, since for both the experimental and the control group the velars were found to be by far the most difficult consonants. The control group's pre and posttests, as well as the experimental group's pretest, also lend support to Yavas' claim, in the sense that the alveolars were more difficult than the bilabials. However, for the experimental group, in the posttest, the alveolars and the bilabials yielded similar paragoge rates, thus suggesting that the difficulty posed by them is approximately the same. All in all, these results support Hypothesis 15.

6.5.4 Markedness and pronunciation instruction

Regarding the perception test, both the control and the experimental groups performed differently in the posttest, managing to improve the rates of correct responses for all natural classes. Note, however, that the experimental group presented greater improvement in the posttest than the control group, thus suggesting that pronunciation instruction might have played an important role in the experimental group's improvement. The consistent improvement of both groups in the posttest, especially the control group, might be partially attributed to task familiarity, since the perception test posed some difficulties for the participants in the pretest (see Section 6.2.1).

As for the production test, the experimental group performed differently in the posttest, managing to reduce considerably the paragoge rates of all natural classes. On the other hand, the control group failed to reduce the paragoge rates of any natural classes. These results suggest that pronunciation instruction might have played an important role in the experimental group's improvement.

6.5.5 Summary and proposed hierarchies of difficulty for perception and production

The results presented from Sections 6.5.1 to 6.5.4 can be used to propose a hierarchy of difficulties for the acquisition of word-final consonants at the perception and production levels. Note that this hierarchy is just an attempt to summarize some of the tendencies found in the dataset, since the number of participants and test tokens is too small to propose a definitive hierarchy of difficulties for English word-final consonants for Brazilian learners.

Furthermore, caution is needed when comparing the present study to previous ones (e.g., Baptista & Silva Filho, 1997; Eckman & Iverson, 1994; Koerich, 2002) that investigated the acquisition of word-final consonants owing to several differences. Different from these studies, and like Silveira (2002a), the present study collected longitudinal data, thus involving pre and posttest comparisons. Similar to Koerich (2002), the present study included a perception and a production test, which allows an investigation of whether the assumptions regarding markedness are valid at both the perception and the production levels. This was not possible in other studies (e.g., Baptista & Silva Filho, 1997; Eckman & Iverson, 1994, Silveira, 2002a), since they collected data using a production test only. Finally, the present study is similar to others in that it investigates the role played by sonority, voicing, and place of

articulation in the acquisition of English word-final consonants by Brazilian learners (Baptista & Silva Filho, 1997; Silveira, 2002a, and Koerich, 2002).

Regarding sonority, Baptista and Silva Filho (1997), as well as Silveira (2002a), found a tendency for the obstruents to cause more paragoge than the nasals, thus supporting Eckman and Iverson's (1994) claim that the least sonorant consonants (obstruents) are more marked than the most sonorant consonants (nasals). Note that most of the studies mentioned so far tested for the effects of sonority using production data only. In the present study, the perception test results corroborate Eckman and Iverson's prediction that obstruents are more difficult than nasals in word-final position. For the production test, the results go in the opposite direction. For the control and the experimental groups, the nasals yielded higher paragoge rates than the obstruents. Therefore, it seems that markedness in relation to sonority might vary for perception and production, and further studies are required in order to enlighten the discussion of the role played by sonority in the acquisition of word-final consonants, especially when orthography issues (the silent <e> condition) seem to be playing a role.

As for voicing, Baptista and Silva Filho (1997) found that voiced consonants tended to trigger more paragoge than their voiceless counterparts, with four out of the six pairs tested (/d/~/t/, /g/~/k/, /s/~/z/, and (/dʒ/~/tʃ/). Nevertheless, the other two pairs showed no difference between voiced and voiceless consonants (/b/~/p/ and /v/~/f/). Koerich (2002) found no voicing effect on the acquisition of word-final consonants, both at the perception and the production levels. Silveira (2002a) also found similar results for the experimental group, but for the control group, the voiceless consonants yielded the highest rates of paragoge. The present study showed that, in the perception tests, the voiceless consonants posed more difficulties than the voiced ones in both the pretest for both groups, but in the posttest the rates between

the two natural classes tended to be very similar. However, in the production tests, the voiced consonants were more difficult for the experimental group in both the pre and posttests, but results were pretty similar for both natural classes for the control group. All in all, these findings suggest that the degree of difficulty posed by voicing seems to be different for perception and production, and further investigation should be conducted to examine why voicing may hinder the perception and production of English word-final consonants by beginning Brazilian learners.

Finally, regarding place of articulation, Baptista and Silva Filho (1997), Koerich (2002) and Silveira (2002a) tested Yavas' (1994) hypothesis that velars were more difficult than alveolars, which, in turn, were more difficult than bilabials. The first two studies corroborated Yavas' hypothesis, but Silveira (2002a) found that the velars tended to yield the highest paragoge rates, but no clear hierarchy was identified for the remaining places of articulation, thus offering partial support to Yavas' claim. In the present study, the production test results showed that the velars triggered the highest paragoge rates and the bilabials tended to present the lowest rates, but these rates were very similar to the alveolars. Thus, the prediction that there is a relationship between the size of the supraglottal area and the difficulty posed by the consonants is partially supported.

Table 22 shows tentative hierarchies of difficulty for English word-final consonants, based on the results obtained for the perception and production tests in the present study. Note that the hierarchies of difficulty for perception and production tend to go in opposite directions for sonority, with obstruents being more difficult than nasals only at the perception level.

Table 22

Hierarchy of difficulty for perception and production.

Sonority		Voicing	
Perception	Production	Perception	Production
obstruents	nasals	voiceless	voiced
nasals	obstruents	voiced	voiceless

Place of articulation		
Perception	Production	
-	velars	*most difficult*
-	alveolars	
-	bilabials	*least difficult*

Table 22 contains no information regarding the effects of the following environment, orthography or lexical knowledge on the degree of difficulty posed by word-final consonants, which were variables assessed for the production test only. However, as seen in Section 6.3.1, when the word-final consonant was followed by a consonant it tended to be easier to produce than when it was followed by a pause or another vowel. This result corroborates Silveira (2002a), but it differs from Baptista and Silva Filho (1997), who found that word-final consonants trigger the highest paragoge rates when they are followed by a consonant, as well as Koerich (2002), in which no clear tendencies for the environment following the target consonant were found. The different results between these studies might be related to the fact that Baptista and Silva Filho (1997) collected data from participants with three different levels of proficiency, while Silveira (2002a) and Koerich (2002) dealt with false beginners only.

Moreover, as seen in Section 6.3.2, when the target consonant is followed by a silent <e> (e.g., *mad<u>e</u>*), it becomes more difficult than when it is not (e.g., *mad*). These results indicate an orthography effect on the production of word-final consonants, which was previously found in Silveira (2002a). Nevertheless, the experimental group managed to neutralize the difference between the words ending in a silent <e> and the ones ending in a consonantal grapheme in the posttest, which indicates that pronunciation instruction has diminished the effects of orthography on the production of word-final consonants. In addition to the effects of the following environment and orthography, the present study assessed whether the variable of lexical knowledge would influence the production of word-final consonants. This variable was found to contribute to the difficulty posed by word-final consonants, since the participants were more likely to resort to vowel paragoge with real words than with nonsense words.

6.6 Additional variables

The present study also investigated whether pronunciation instruction affected the general language syllabus (Hypothesis 16), and whether the acquisition of word-final consonants was influenced by the following individual differences variables (Hypothesis 17): (a) gender, (b) age, (c) private English course attendance, (d) favorite language component, (e) learning of another foreign language, (f) travel to an English speaking country, and (g) additional exposure to the L2. Furthermore, the experimental group completed a questionnaire evaluating the pronunciation instruction they received. These evaluations are an important way of gaining some feedback regarding the learners' opinion about the pronunciation component, as well as the materials and procedures used by the researcher.

6.6.1 Hypothesis 16: Pronunciation and the language syllabus

The pronunciation instruction given to the experimental group might have taken too much time away from the rest of the language syllabus, thus jeopardizing the learning of the rest of the course, but Hypothesis 16 predicted that pronunciation instruction would not affect the language syllabus. This hypothesis was assessed by making a comparison between the two groups' performance on two written tests (maximum score = 100) that were used as the main criteria to evaluate the learners in the language course.

As the results displayed in Table 23 show, the control group obtained slightly higher scores than the experimental group for the first written exam (M=75.3; SD=19.26 for the control group, and M=76.83; SD=28.37 for the experimental group). This difference was not significant, as demonstrated by an independent sample Mann-Whitney test (z=-.59; p=.58), thus indicating that, before the experiment began, the two groups were similar concerning general English proficiency. The experimental group's mean scores in the second exam, which was administered after the pronunciation instruction period, at the very end of the course, was actually higher (M=76; SD=15.15) than the one obtained by the control group (M=69.3; SD=17.49). Therefore, the second written exam showed that the experimental group did not lag behind in their knowledge of grammar, listening comprehension skills, and vocabulary after having part of their class time allocated for pronunciation instruction. The difference between the mean scores of the control and the experimental groups in the second written exam was not significant either, as shown by an independent sample Mann-Whitney test (z=-.45; p=.64). Therefore, Hypothesis 16 is supported because it seems that assigning class time to work on pronunciation has no negative effect on the learning of the other skills that comprise the language syllabus.

Table 23

Score, mean and SD in the two written exams.

	Control Group			Experimental Group	
	Written Exam 1	Written Exam 2		Written Exam 1	Written Exam 2
S1	95	87	S11	90	75
S2	80	76	S12	34	-
S3	77	75	S13	98	72
S4	91	84	S14	46	46
S5	77	70	S15	96	81
S6	49	51	S16	90	60
S7	83	50	S17	70	68
S8	90	89	S18	55	83
S9	34	42	S19	85	83
S10	77	-	S20	95	97
			S21	63	73
			S22	100	98
Mean	75.3	69.3		76.83	76.0
SD	19.26	17.49		28.37	15.15

6.6.2 Hypothesis 17: Individual differences variables

The questionnaire was a valuable instrument to help the researcher build the participants' profile regarding demographic information and foreign language background. This instrument allowed the assessment of the following variables: (a) gender, (b) age, (c) private English course attendance, (d) favorite language component, (e) learning of another foreign language, (f) travel to an English speaking country, and (g) additional exposure to the L2. Hypothesis 17 predicted that these variables would not influence the acquisition of word-final consonants.

The present study offers no clear results for Hypothesis 17. Due to the small number of participants, running any sophisticated statistical test including these individual differences variables and the participants' performance on the perception, production and written tests would have been inadequate. However, we can speculate about possible relationships among some of these variables simply by observing the frequencies displayed in Table 24.

Table 24

Individual differences variables, perception, production, and written tests scores.

	Perc. Pre	Perc. Post	Prod. pre	Prod. post	Written exam 1	Written exam 2	Experience abroad	Additional Exposure	Private Course	Likes pronunciation	Pronunciation is difficult	Foreign language	Age	Gender
S1	*9*	19	25	40	95	87	0	1	1	1	0	0	22	M
S2	18	20	3	5	80	76	0	1	0	1	0	0	20	F
S3	19	11	27	29	77	75	0	1	0	1	0	0	20	M
S4	21	22	4	13	91	84	0	1	0	1	0	0	22	M
S5	19	22	12	11	77	70	0	1	0	1	0	0	18	F
S6	21	22	7	6	49	51	0	1	0	0	1	0	14	M
S7	17	23	15	12	83	50	0	1	1	0	0	0	20	M
S8	21	22	11	12	90	89	0	1	1	1	0	0	19	F
S9	14	17	17	14	34	42	0	1	1	1	1	0	15	M
S10	21	22	7	7	77	-	0	1	0	1	0	0	18	M
S11	15	24	23	14	90	75	1	1	0	1	0	0	20	F
S12	16	19	28	20	34	-	0	1	0	-	-	0	26	F
S13	12	24	18	11	98	72	0	1	0	1	1	0	21	F
S14	17	18	46	31	46	46	0	1	0	1	0	0	28	F
S15	11	19	34	23	96	81	1	0	1	1	0	0	19	F
S16	11	*12*	22	17	90	60	0	1	0	1	1	0	22	M
S17	20	22	42	23	70	68	0	1	0	1	1	0	20	M
S18	10	15	53	30	55	83	0	1	0	1	0	0	22	F
S19	15	16	44	34	85	83	0	1	1	1	0	1	25	M
S20	17	22	26	14	95	97	0	1	1	1	0	0	18	M
S21	9	*7*	36	31	63	73	0	1	1	1	1	0	21	M
S22	23	24	1	2	100	98	0	1	1	1	1	0	20	M

Notes: (a) N for perception=24; N for production=78 (b) The scores for the perception tests represent the number of correct responses, and for the production tests, the frequency of paragoge. (c) For the variables Experience abroad, Private Course, Likes Pronunciation, and Pronunciation is difficult: 0=no; 1=yes. (d) For the variable Additional Exposure (e.g., via music, TV or movies), 0=no exposure to English; 1=moderate exposure to English; 2=intense exposure to English.

Regarding the participants' performance on the written tests, we still need to discuss whether these scores were related to those of the perception and production tests. In general, this relationship was absent from the data, with the exception of one participant from the experimental group who obtained the best scores in both written exams and the perception and production tests (S22). Conversely, many participants who obtained very high scores in the written tests obtained very low scores in the perception and/or production tests (e.g., S1, S15, S16). These results suggest that learners' ability to acquire L2 pronunciation is not necessarily connected to their ability to acquire other language skills (e.g., grammar and vocabulary).

None of the participants in the control group and only one in the experimental group had knowledge of another foreign language, and only two participants in the experimental group (S11 and S15) had traveled to an English speaking country, but only for a very short period. As can be seen in Table 24, these participants' short experience abroad was insufficient to help them obtain better scores than the other participants in the tests.

Almost all participants of both groups reported having moderate additional exposure to English, most of them via music, TV or the movies. As nearly all participants reported having a similar amount of additional exposure to the target language, it is difficult to draw any conclusions about the influence of this variable on the participants' performance on the research tests.

Table 24 displays results about the participants' previous attendance at English private courses. Four participants of each

group had previously studied English under these conditions (S1, S7, S8, and S9 of the control group, and S15, S19, S20, and S22 of the experimental group). However, only one of these participants (S22) obtained high scores in both the written tests and the perception and production tests, thus suggesting that previous experience with the learning of English is not a good predictor of the participants' performance on the research tests.

Nearly all participants in the experimental group reported liking to study English pronunciation, although half of them think pronunciation is difficult to learn. Similarly, most participants in the control group reported liking learning about pronunciation, although most of them also think this skill is very difficult. Once again, it is difficult to draw conclusions about whether liking pronunciation instruction or finding it difficult may affect the participants' performance on the research tests.

6.6.3 Participants' evaluation of the pronunciation instruction

A short questionnaire was administered to the experimental group in order to verify their opinion about the period of pronunciation instruction they underwent. Table 25 shows that all the participants who answered the questionnaire liked the pronunciation exercises, found them useful, and would like to continue having pronunciation classes. Unfortunately, 4 participants did not complete the third page of the questionnaire, which contained the questions regarding the pronunciation material. Another participant missed the class the day the questionnaire was administered. Thus, we cannot affirm categorically that all the participants had a positive opinion about the pronunciation classes, but we can make such an assumption based on the feedback provided by almost 60% of the participants.

Table 25

Experimental group's feedback on pronunciation instruction.

	Liked the exercises	Found the exercises useful	Continue with pronunciation classes
Yes	7	7	7
%	(100)	(100)	(100)
No	-	-	-

N=7; missing information=5

The questionnaire included an item in which the participants could freely evaluate the course. Only three participants[7] made specific comments regarding pronunciation, yet all of them mentioned that class time should be devoted to the instruction of this important skill[8]:

> The pronunciation exercises should be more frequent. (S15)
>
> There should be more pronunciation exercises. (S25)
>
> Although I have studied English before, learning about pronunciation details, especially at the end of the words, was something new to me. I think we should have more pronunciation exercises. (S26)

These results lead to the conclusion that some learners seem to be aware of the importance of the pronunciation skill and they appreciate when class time is devoted to the instruction of this component.

7 Two of these participants were excluded from the study for not having completed all the tasks.

8 The researcher translated the participants' comments.

6.7 Summary of Results and Final Comments

The crucial question guiding the present study was whether pronunciation instruction could facilitate the acquisition of word-final consonants. The perception pretest results showed that, before the experiment began, the experimental group had more difficulties discriminating between CV and CVC syllabic patterns with word-final consonants that are not present in their L1 syllabic inventory than the control group. This finding made the comparison between the posttest results for the two groups difficult because, although the experimental group increased considerably their rates of correct responses, their scores were still lower than those of the control group. In order to obtain a clearer picture of the effects of pronunciation instruction, the perception data were analyzed more thoroughly. Thus, within and across-groups' analyses for practiced and non-practiced consonants were carried out, and the gain scores across the pre and posttests were calculated. First, these analyses showed that individual differences played an important role in the results, with some participants obtaining rates considerably higher or lower than the means obtained by each group. Second, the gain score results showed that the experimental group increased their rates of correct responses more than the control group, but that this improvement was not significant. Based on these results, it is difficult to make a case for the effects of pronunciation instruction as the only factor to impact the posttest results. It seems that, for the perception test, task familiarity could be an important variable to consider, as well as language exposure. The analysis of practiced versus non-practiced consonants revealed that only the experimental group obtained significantly higher scores with the practiced consonants in the posttest, which indicates a positive effect of pronunciation instruction. Both the experimental and the control groups improved their performance on the non-practiced consonants in the posttest, but this result reached no significance,

thus suggesting that other factors (e.g., language exposure) might account for this improvement, but not pronunciation instruction.

A more positive answer for the role of pronunciation instruction was obtained with the production test. As previous studies have demonstrated, vowel paragoge was a frequent syllable simplification strategy used by Brazilian learners to produce CVC syllables containing word-final consonants that are not present in their L1 syllabic inventory. Once again, the experimental group had a significantly worse performance on the pretest than the control group, which showed that the two groups were already different before the experiment began. However, in the posttest, the experimental group managed to reduce the paragoge rates more effectively than the control group, although this difference failed to reach statistical significance. Nevertheless, the fact that the experimental group started significantly worse than the control group and ended with a better performance, albeit not significant, can be interpreted as supporting the prediction that pronunciation instruction can benefit the acquisition of word-final consonants. Thus, within and across-groups' analyses, and a comparison between practiced and non-practiced consonants were carried out, and the gain scores across the pre and posttests were calculated. The results showed considerable variation in the data set, with some participants obtaining either extremely low or extremely high paragoge rates, showing once again the influence of individual differences. The gain scores per participants confirmed the significantly better performance of the experimental group compared to the control group, and only a general tendency for improvement among the control group participants. The analysis of practiced versus non-practiced consonants showed that the experimental group managed to reduce the paragoge rates of both groups of consonants in the posttest, but only the results for the practiced consonants reached significance. All in all, these results signal a positive effect of pronunciation instruction on the production of word-final consonants.

In order to better understand the results, other perception and production variables were also analyzed. The perception test design caused the participants some difficulty, as shown by the analysis of their performance with catch trials. The order in which the targets appeared in the perception test had a slight effect on the degree of difficulty as well, since those that appeared in the third position in the triad yielded the lowest rates of correct responses, especially in the experimental group's pretest. This result suggests that the use of a categorical discrimination test with short sentences might not be the best way of collecting data with beginners. As for the production test, three variables proved to be relevant: the following environment, orthography, and lexical knowledge. When the target consonant was followed by a consonant, it yielded the lowest paragoge rates in the pretest, but in the posttest, the difference between the three contexts tested (vowel, pause, and consonant) was practically neutralized for the experimental group, and partially neutralized for the control group. This result suggests that the following environment can play an important role in the very initial stages of second language acquisition, but that after a while these environments tend to be equally difficult. Moreover, orthography appeared to be a relevant factor in determining the rates of vowel paragoge, since words ending with a consonantal grapheme followed by a silent <e> triggered significantly higher paragoge rates than those ending in a consonantal grapheme only in the pre and posttests of the control group, and the pretest of the experimental group. Nevertheless, the results for the experimental group posttest indicated that pronunciation instruction has diminished the effects of orthography on the production of word-final consonants. Moreover, spelling also caused participants to transfer L1 processes such as the deletion of nasals, with the preceding vowel assimilating the nasal feature, and the substitution of alveopalatal affricates for alveolar stops. Finally, the variable lexical knowledge had an effect on the production scores, since

the paragoge rates for real words were significantly higher than for the nonsense words within groups, in the pre and posttests.

As the control group also improved their performance on the perception posttest, pronunciation instruction alone could not account for this improvement. Thus, correlations were run to identify whether the perception and production posttests were interacting. These variables were significantly correlated, showing a possible interaction between perception and production, as well as between pre and posttest scores. Due to the small sample size, no sophisticated statistics were run to scrutinize these correlations. However, an overall comparison of the perception and the production scores of each participant showed that, in general, the participants with the best performance on the perception test were also those with the best performance on the production test. Similarly, the participants with the worst performance on the perception test also tended to be those with the worst performance on the production test.

Another purpose of the present study was to test for the role of markedness in the acquisition of word-final consonants at both the production and the perception levels. The results indicated that markedness might affect perception and production differently. Concerning sonority, the perception test showed that the more marked obstruents were more difficult than nasals. However, opposite hierarchies were found for the production test as regards sonority. Another markedness factor assessed was voicing. For the experimental group, the findings suggest a tendency for voiceless consonants to pose more difficulty at the perception level, and the voiced ones to be more difficult at the production level. Finally, as for place of articulation, the production test results showed that velars are more difficult than alveolars and bilabials.

Another important finding was that, although pronunciation instruction occupied part of the class time from the experimental group, it did not interfere with the learning of the rest of the

syllabus content. This result was found by comparing the scores of the experimental and the control groups in the written exams. Probably, the integration of the pronunciation instruction with the course syllabus prevented the experimental group from lagging behind in their knowledge of grammar, listening comprehension skills and vocabulary, compared to the control group.

Individual difference variables were considered as possible predictors of the posttest results, namely, (a) gender, (b) age, (c) private English course attendance, (d) favorite language component, (e) learning of another foreign language, (f) travel to an English speaking country, and (g) additional exposure to the L2. Due to the limited dataset, it was difficult to verify whether these variables really played a role in the acquisition of word-final consonants.

Finally, the experimental group evaluated the instruction period via a questionnaire. The results revealed a positive opinion about the pronunciation materials used in class, as well as a positive attitude towards the instruction of the pronunciation component.

7. Conclusion

7.1 Theoretical implications

In the present study, longitudinal data of adult Brazilian learners of English were examined to provide insights into the role of pronunciation teaching in the acquisition of word-final consonants at the perception and production levels. In addition, markedness variables and some additional variables tested by previous interphonology studies were assessed. Another concern was to investigate whether the pronunciation instruction period affected the learning of the rest of the language syllabus, as well as the effects of individual differences variables on the acquisition of word final consonants.

The pronunciation manual used with the experimental group was designed taking into account Celce-Murcia et al. (1996). These authors propose a framework based on a communicative approach to pronunciation teaching, suggesting that a pronunciation unit should encompass five stages: (a) description and analysis, (b) listening discrimination, (c) controlled practice and feedback, (d) guided practice and feedback, and (e) communicative practice and feedback. Because the participants of this study were beginners, following Celce-Murcia et al's orientation when designing the pronunciation manual was sometimes difficult. Thus, designing some of the more communicative tasks and integrating the pronunciation content with that presented by the learners' course book was a challenging endeavor. The manual should undergo

further revision, but despite its limitations, it seems to be a valuable resource to help Brazilians who are learning English at the beginning level to acquire word-final consonants.

There is some evidence that pronunciation instruction can facilitate the acquisition of word-final consonants, since the experimental group succeeded at reducing significantly the paragoge rates in their production posttests. Some participants from the control group presented reduced paragoge rates in the posttest, which suggests that there might be other factors influencing the acquisition of word-final consonants (e.g., exposure to the L2), since pronunciation teaching cannot account for this improvement. On the other hand, pronunciation teaching seems to be less successful as regards perception skills. Although the experimental group increased their scores of correct responses considerably more than the control group in the perception posttest, this improvement was not statistically significant. It seems that, for the perception test, task familiarity could be an important variable to consider, as well as language exposure and individual differences. All in all, the results showed that the positive effects of pronunciation instruction were greater at the production level than at the perception level. The fact that perception can be more impervious to changes than production was previously demonstrated by Flege, Bohn and Jang (1997), who observed that exposure to the L2 has a greater effect on production than on perception.

It is important to point out that pronunciation teaching seems to have helped the experimental group to reduce the paragoge rates considerably in the posttest with both practiced and non-practiced consonants, thus suggesting that information about the pronunciation of word-final consonants was generalized to contexts that were not explicitly addressed by the pronunciation material.

A possible interaction between perception and production in the acquisition of word-final consonants was investigated

by comparing each participant's performance in the perception and production tests. Corroborating Koerich (2002), a positive interaction between perception and production was found, since the participants who performed better in the perception test tended to obtain the best scores in the production test.

The perception test design caused the participants some difficulty, as shown by the analysis of their performance with catch trials. The same was true for the order in which the targets appeared in the perception test, since the targets that appeared in the third position in the triad yielded the lowest rates of correct responses. This result suggests that the use of a categorical discrimination test might not be the best way of collecting data with beginners, or possibly that this test should not be used with sentences, as in the present study. As the control and the experimental groups performed similarly in the perception pre and posttests concerning the order effect, teaching seems to have had little effect on the influence of this variable.

The production test results were also influenced by three variables: (a) The following environment (targets followed by consonants yielded the lowest paragoge rates), (b) orthography (targets ending in a silent <e> tended to yield the highest paragoge rates), and (c) lexical knowledge (real words triggered more paragoge than nonsense words). Pronunciation teaching helped the experimental group neutralize the difference between the three environments following the target consonants (vowel, pause or consonant) and orthography (silent <e> condition). Nevertheless, teaching was less effective as regards lexical knowledge, and this variable continued to affect the posttest results of the experimental and the control groups.

Another purpose of the present study was to test for the role of markedness in the acquisition of word-final consonants at both the production and the perception levels. The results indicated that sonority might affect perception and production differently because the perception test showed that the more

marked obstruents are more difficult than nasals, whereas the production test showed the opposite. Another markedness factor assessed was voicing, and the findings suggest no clear differences between voiced and voiceless consonants for the perception and the production tests when we consider the results for both groups. However, the experimental group, who clearly had more difficulties with the perception and production of word final consonants than the control group, performed better with voiced consonants in the perception test, but inserted more paragogic vowels (worse performance) when producing voiced consonants.. Finally, as for place of articulation, the results for the production test lend support to what is predicted in the literature, that is, velars are more difficult than alveolars, which are more difficult than bilabials, although, as demonstrated by Koerich (2002), the rates for bilabials and alveolars are very similar. Most interphonology studies dealing with the acquisition of the L2 syllabic inventory have relied on production data only. The present study corroborates Koerich (2002), as both have demonstrated that markedness can affect perception and production of word-final consonants in different ways, and that proposing a hierarchy of difficulty for this type of consonant based exclusively on production data would be inadequate.

Pronunciation instruction had no negative effect on the learning of the general language syllabus, and this result is probably due to the fact that the researcher made an effort to integrate the pronunciation material with the course book used by the experimental group. Thus, when this group was receiving pronunciation teaching, they also had a chance to practice structures and vocabulary that were present in their course book.

Pronunciation instruction helped the experimental group reduce the paragoge rates in the production posttest, but it did not eliminate paragoge. Moreover, in the perception test, pronunciation instruction seemed less effective than in the

production test. These results demonstrate that instruction had no immediate effects, and it operated in a different way depending both on the skills being tested and on the particular learner, since the participants who improved in the experimental group tended to be different for both the perception and production tests.

Extensive practice is expected to contribute to the automatization of the phonological component (Baptista, 1995). In the present study, the experimental group received 4 hours of pronunciation teaching, which contributed to their performance in the production test, but was insufficient to help them build procedural knowledge concerning word-final consonants. These results corroborate the assumption that, at the initial stages of language acquisition, learners lack automatized phonological processes and tend to use the L1 processes as default (Flege, 1987; Baptista, 1995). The chances are that, if L2 learners continue to resort to the L1 phonological processes for a long time, this procedure will become automatized, even for cases where the L1 phonological patterns are inadequate for the L2 (Baptista, 1995). In the present study, the comparison between frequent and non-frequent words corroborated this prediction, since the cognates and the words that are frequently found in English course books were less influenced by pronunciation instruction than the nonsense words. Thus, the words learned early on are automatized with inappropriate pronunciation. After the appropriate pronunciation is learned it is applied to new words, but the first words continue to be pronounced the same and are more likely to become resilient to change.

Regarding the perception test, however, improvement in the posttest was found for both the experimental and the control groups, which indicates that, at the perceptual level, pronunciation instruction is not the only factor influencing the acquisition of word-final consonants. Therefore, it is possible that language exposure per se helped learners start discriminating between the CVC and CV.CV words more accurately, but again,

simple exposure is not sufficient to result in the acquisition of the CVC syllabic pattern in which the word-final consonant is an obstruent or a nasal.

7.2 Pedagogical implications

Several researchers and educators have made a strong case for the importance of pronunciation teaching as a means of helping learners to develop communicative ability. Nevertheless, the pronunciation component has been greatly neglected in the language classroom and materials. Moreover, when this component is present in course books, it tends to be piecemeal, isolated from the other language skills, focusing mostly on descriptive and controlled tasks.

The pronunciation component addressed by the present study was English word-final consonants, which are difficult to acquire because, like codas in general, they are extremely marked and subject to restrictions. Therefore, word-final consonants should be emphasized in pronunciation teaching, especially in the case of Brazilian learners, whose L1 presents severe restrictions as to the segments that can appear in this position. Based on the findings from the present study, the recommendation is that practice with word-final consonants should start with monosyllabic CVC words, and address the perception and production skills. In addition, it is important to practice final consonants not only in isolation, but also in context, starting with the easiest environment (according to the present study results, when the consonant is followed by another consonant) and progressing to the most difficult ones (when the consonant is followed by a vowel or a pause).

Learners need to be aware of the comprehension problems caused by the addition of a vowel to word-final consonants, and for this purpose exercises that include minimal pairs such as "fog"/"foggy" and "rain"/"rainy" can be useful. It is necessary to

address orthography issues and help learners understand that the correspondence between spelling and sound in English is very different from that of Portuguese. For example, it is necessary to call attention to the fact that (a) the silent <e> is not pronounced; (b) that /m/ and /n/ have to be fully articulated and with only limited assimilation of the nasal feature to the preceding vowel; and that (c) <ng> sounds like /ŋ/, and is not followed by /g/ in standard English. Furthermore, pronunciation exercises should include practice with both words that the learners are likely to encounter at the very first stages of L2 learning and cognates, since these words are more likely to continue to be pronounced with the help of a paragogic vowel than new words. This happens because, as observed by Flege (1987) and Baptista (1995), at the initial stages of SLA, learners tend to regard the L1 and the L2 sound systems as being alike, thus relying greatly on their L1 sound system to produce the L2 with words learned early on. This may cause these words to become more resilient to changes than the words learned later on, since the non-target pronunciation might become automatized.

Therefore, it seems that the earlier the learners realize the L1 sound system should not be transferred to the L2, the greater the chances of minimizing fossilization at the phonological level (Baptista, 1995). Pronunciation instruction should be a priority at the initial stages of L2 learning. In addition, if lexical knowledges proves to be an important variable with other pronunciation aspects, it is necessary to reconsider the role of frequent and new vocabulary in pronunciation materials. It seems that both types of words have an important role in the pronunciation lesson, with the new ones being adequate at the more controlled stages of a pronunciation lesson only (description and analysis and listening discrimination) because including difficult vocabulary in the production stages results in an additional burden to the learner. Furthermore, working with the correct pronunciation of the frequent words should be a priority, and this type of word

should be emphasized in all of the five stages of the pronunciation framework suggested by Celce-Murcia et al. (1996).

Cognitive theory seems particularly relevant for SLA because it emphasizes the importance of practice as a way of optimizing the information-processing limitations of human learners (e.g. Rumelhart & Norman, 1978; MacLaughlin, 1997). Optimization results from the automatization of skills that initially require the use of controlled processes, utilizing considerable information-processing capacity. Although practice can help learners overcome their processing limitations, one cannot assume that practice will result in immediate automatization of the skills being tackled. Initially, practice may contribute to the accumulation of information, which will be organized gradually, and will eventually become automatized as restructuring takes place (Rumelhart & Norman, 1978).

A positive finding regarding classroom practice is that the participants of the experimental group apparently generalized the information they received about 9 word-final consonants to the production of the nasals, which were not practiced in class. This indicates that the pronunciation material does not need to address exhaustively all the contexts that are prone to paragoge, but that offering extensive practice in some contexts may be sufficient to help learners produce virtually all word-final consonants without resorting to paragoge.

The present study has demonstrated that the participants' performance in perception and production are closely associated, and that perception seems to benefit less from teaching than production. Thus, it is suggested that pronunciation instruction materials should include more exercises at the perception level. The general tendency in pronunciation materials is for the perception exercises to precede the production exercises, and the former only appears at the beginning of the unit. This was also the case in the pronunciation manual used in the present research (Appendix E). Perhaps inserting more perception

exercises throughout the whole pronunciation unit is a good way to offer further practice with discrimination skills. It is certainly important to help learners hear the difference between CVC and CV.CV words in order to help them improve their production.

Pronunciation teaching has been neglected on the grounds that the pronunciation component is not a major concern of learners, or that assigning class time for this component may hinder the learning of the other language syllabus components. However, the present study showed that the experimental group (a) evaluated the pronunciation teaching period positively, (b) were aware of the importance of the pronunciation skill, and (c) appreciated when class time was devoted to the teaching of this component. Furthermore, the experimental group and the control group obtained similar scores on the written exams used as the main criteria to evaluate the learners in the language course, thus showing that the time allocated for pronunciation instruction did not jeopardize the learning of the rest of the course content by the experimental group.

7.3 Limitations and suggestions for further research

As the data investigated by the present study were limited, the results presented here should be treated with a great deal of caution. First, the present study dealt exclusively with beginning learners. This made it difficult to design a task to collect more naturalistic speech samples, owing to the participants' difficulty in performing this type of task at the time the pretest was given. Thus, the present study cannot make any claims regarding the effects of pronunciation teaching in more naturalistic speech contexts, since the participants were tested only in a sentence-reading task and a categorical discrimination test. Future research should address the effectiveness of pronunciation teaching with more proficient learners in order to collect and compare speech

samples that range from controlled to more naturalistic. Studies with more proficient learners could also investigate whether these learners are more resilient to change than beginners.

The present study yielded results that challenge findings of a previous study concerning the role of sonority and the following environment in the acquisition of word-final consonants by Brazilian learners (Baptista & Silva Filho, 1997). Several explanations might account for this disagreement. First, the present study dealt exclusively with beginning learners, while Baptista and Silva Filho dealt with learners from different proficiency levels. Second, the study reported here used a limited number of tokens (3 to 6) and only 1 or 2 different words to test each target consonant, whereas Baptista and Silva Filho had 27 tokens for each target consonant. Further research should be carried out in order to clarify the conflicting results obtained by the two studies.

Furthermore, caution is needed when comparing the present study to previous ones. Different from these studies, and like Silveira (2002a), the present study collected longitudinal data, thus involving pre and posttest comparisons. In addition, both studies extended previous ones (Baptista & Silva Filho, 1997 and Koerich, 2002) by assessing the effects of pronunciation teaching, which implies that their posttest results were influenced by the teaching variable. A major difficulty was that the experimental group performed much worse in the pretests than the control group, despite the fact that the participants of both groups were enrolled in the first level of the same English course and obtained similar scores in the first general language skills written exam. This made it difficult to analyze the posttest results in order to verify the effectiveness of pronunciation instruction, but it also showed the power of individual differences in SLA, and that pronunciation skills are not necessarily related to knowledge about grammar, vocabulary or listening comprehension skills. Future research should insure that the groups being compared

possess similar initial abilities regarding the discrimination and production of word-final consonants, so that the assessment of the effects of pronunciation teaching can be facilitated. In addition, long-term data need to be collected in order to investigate whether the effects of pronunciation instruction last longer than a week, which was the only time when the posttest was administered in the present study.

Like many other classroom studies, the present one is limited in that it tested a small sample, and the reasons for this were two-fold. First, the researcher was in charge of teaching both the experimental and the control groups, in order to avoid the influence of an additional variable – different instructors, and this made it impossible to include more than two groups. Second, at the time the experiment was carried out, the schedule of the course the participants were attending had been changed due to a long strike at the university in the previous year. The result was that the number of students who registered for the courses was smaller than usual, and some of them had to change classes in the middle of the term, since they had schedule conflicts between their undergraduate and extracurricular courses when they registered for the 2002.2 classes. The small sample size made it difficult to run more sophisticated statistical tests, and further research should be carried out with a large sample size (at least 30 participants in each group), so that results supported by powerful statistical tests can be used to attest the effects of pronunciation instruction on the acquisition of word-final consonants. As pointed out by Pennington and Richards (1986), the area of pronunciation instruction is in need of studies that gather data to help clarify the status of pronunciation instruction. They remind us that such data can only be obtained if future research succeeds at specifying the pronunciation features targeted, and the teaching procedures used, as well as showing how the effects of the treatment were measured.

Due to time constraints, only the obstruents were included in the pronunciation materials and the nasals were left out. This

initial drawback made possible the comparison between practiced and non-practiced consonants, which yielded interesting results concerning the effects of pronunciation instruction. Nevertheless, further research needs to indicate whether the word-final nasals can also benefit from pronunciation instruction. Another important finding was that real words tended to trigger higher paragoge rates than nonsense words, thus indicating that lexical knowledge can play a role in the acquisition of word-final consonants. This issue should be addressed by future research concerning word-final consonants, as well as other pronunciation aspects that pose difficulty to Brazilian learners (e.g., vowels, /θ/ and /ð/).

Despite its limitations, this study represents an important contribution to the area of pronunciation teaching, for it brings together theory, research and practice in the development and testing of pronunciation materials. Although the integration between theory, research and classroom practice has been absent in the area of pronunciation teaching, it is fundamental for the development of this area (Morley, 1991; Hammond, 1995; Baptista, 2000, Silveira, 2002a). More studies are necessary to test for the benefits of this integration, and to devise new ways of accomplishing it.

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Appendix A

INDIVIDUAL DIFFERENCES QUESTIONNAIRE

(Part I – personal information)

1. What is your name? ……..……..
2. How old are you?……
3. Where were you born? ……...
4. Where did you live when you were a child? ……..
5. Where did you live most of your life? ……....

(Part II – language knowledge)

6. Do you speak a language other than Portuguese?
   Yes ❑ No ❑

7. If you speak a language other than Portuguese:

   a. What is that language?…….....
   b. How often do you speak that language?

Always or most of the time	❑
Sometimes	❑
Never or hardly ever	❑

8. How well do you:

	Very well	Fairly well	Not well	Not at all
a. understand that language?	❑	❑	❑	❑
b. speak that language?	❑	❑	❑	❑

(Part III – exposure to English)

9. Have you studied English before? Yes ❑ No ❑

10. If yes:

a. Where?

Pre-school	❑
Elementary school	❑
Junior high	❑
High school	❑
Private course	❑

b. How long?

	1 year	2 years	3 years	4 years
Pre-school	❑	❑	❑	❑
Elementary school	❑	❑	❑	❑
Junior high	❑	❑	❑	❑
High school	❑	❑	❑	❑
Private course	❑	❑	❑	❑

c. What did you study?

	Always or most of the time	Sometimes	Never or hardly ever
Grammar	❑	❑	❑
Reading	❑	❑	❑
Writing	❑	❑	❑
Speaking	❑	❑	❑
Listening	❑	❑	❑

11. How often do you:

	Always or most of the time	Sometimes	Never or hardly ever
i. listen to songs in English?	❑	❑	❑
ii. sing songs in English?	❑	❑	❑
iii. translate songs from English into Portuguese?	❑	❑	❑
iv. watch movies in English?	❑	❑	❑
v. watch TV shows in English?	❑	❑	❑

12. Have you ever been to an English speaking country?
Yes ❑ No ❑

13. If yes,
a. Which country?.....
b. How long did you stay there?…….....
c. How old were you when you went there?…….....

(Part IV – self-assessment)

14. When studying English, what do you like the most?

	Very much	Not very much	Not at all
Grammar	❑	❑	❑
Reading	❑	❑	❑
Writing	❑	❑	❑
Listening	❑	❑	❑

Speaking	❑	❑	❑
Pronunciation	❑	❑	❑

15. When studying English, what do you think is the most difficult?

	Very difficult	Not very difficult	Not difficult at all
Grammar	❑	❑	❑
Reading	❑	❑	❑
Writing	❑	❑	❑
Listening	❑	❑	❑
Speaking	❑	❑	❑
Pronunciation	❑	❑	❑

Appendix B

FOLLOW-UP QUESTIONNAIRE FOR THE EXPERIMENTAL GROUP

Name:

1. How did you like:

	Very much	Not very much	Not at all
i. the course-book?	❑	❑	❑
ii. the audio tapes?	❑	❑	❑
iii. the video tapes?	❑	❑	❑
iv. the pronunciation manual?	❑	❑	❑
v. the games, songs and speaking activities?	❑	❑	❑
vi. using the language lab	❑	❑	❑

2. Do you think the pronunciation activities we did in this class will help you to learn the pronunciation of English?

Very much	❑
Not very much	❑
Not at all	❑

3. Would you like to continue studying pronunciation in your next English course?

Very much	❑
Not very much	❑
Not at all	❑

Appendix C

PRODUCTION TEST

/p/	/b/	/t/
I want the *map*.	I'm going to the *club*.	I have a *cat*.
The *map* is over there.	There is a nice *club* over there.	Would you like a *cat* or a dog?
The *map* can help.	He goes to the *club* to dance.	The *cat* looked sad.
Do you have the *tape*?	I want to buy a *cube*.	You are *late.*
I have the *tape* and the CD.	The *cube* is black.	He is *late* every day.
I need a new *tape* too.	He'll buy the *cube* tomorrow.	You can't be *late* today.

/d/	/k/	/g/
He is *mad*.	See you next *week.*	I bought a *bag*.
I am *mad* about you.	This is the best *week* ever.	I forgot my *bag* again.
Mad people go there.	This *week* may be sunny.	The *bag* can be mine.
Where is it *made*?	What can I *take*?	
It is *made* of glass.	I can *take* a photo.	
I *made* some coffee.	They *take* the bus to school.	

33 sentences

/f/	/v/	/dʒ/
It is a nice *roof*.		
Paint the *roof* and the walls.		
The *roof* has a problem.		
I saw your *wife*.	Who do you *love*?	I read one *page*.
His *wife* is working.	I *love* all kinds of food.	I write a *page* every day.
My *wife* left last week.	Your *love* can help people.	Open your book to *page* ten.

/m/	/n/	/ŋ/
He cleans this *room*.	Can you *clean*?	Does he sing?
The *room* is nice.	He is going to *clean* everything.	They *sing* every weekend.
I reserved a *room* for you.	It is a *clean* house.	I can *sing* something nice.
What is your *name*?	The weather is *fine*.	
I can't read the *name* again.	He is a *fine* actor.	
His *name* can't be correct.	The police officer is a *fine* person.	

27 sentences

Non-sense words:

/t/	/d/	/k/
I saw a *vit*.	They can *sid*.	I can't see the *gock*.
The *vit* is open.	The boys *sid* every day.	The *gock* is mine.
A *vit* can be there.	They *sid* for life.	They need the *gock* now.
He has a *pite*.	Do dogs *mide?*	We want to *sike*.
The *pite* and the car are nice.	The ladies *mide* and cry.	They *sike* every day.
Bring the *pite* now.	The train will *mide* to the city.	I will *sike* some for you.

18 sentences

Test Sample

Universidade Federal de Santa Catarina
Departamento de Língua e Literatura Estrangeiras
Curso Extracurricular - 2002.2

TESTE

Instruções:

1. Escreva seu nome e sobrenome na etiqueta da fita cassete (lado A).

2. Siga as instruções da pesquisadora para usar o gravador.

3. Para testar o gravador, grave o texto abaixo:

Brasil conquista o penta e amplia a hegemonia no futebol mundial

Nunca antes uma final de Copa do Mundo teve tanto valor histórico. Em confronto inédito entre as duas maiores seleções de todos os tempos, o Brasil venceu hoje a Alemanha por 2 a 0 e se tornou o primeiro e único país pentacampeão mundial de futebol. Na primeira Copa do terceiro milênio, primeira no continente asiático e também a primeira a ser dividida entre dois países (Coréia do Sul e Japão), o time comandado por Luiz Felipe Scolari ampliou e consolidou ainda mais o domínio brasileiro no esporte mais popular do planeta, além de ofuscar o fiasco da decisão da Copa-98, com a traumática derrota para os franceses.

(Eduardo Vieira, Folha Online – 30/06/2002)

4. Faça uma leitura silenciosa das frases nas próximas páginas e em seguida grave as frases na fita cassete.

5. Você pode interromper a gravação e repetir a mesma frase quantas vezes achar necessário. Se você tiver que parar no meio de uma frase, tossir, etc., grave a frase novamente.

6. Por favor, não rebobine a fita caso queira gravar a mesma frase mais de uma vez.

Muito obrigada por colaborar com essa pesquisa.

Rosane Silveira
Doutoranda do Programa de Pós-Graduação em Inglês

(Original version)

1. I want the map.

2. The map is over there.

3. The map can help.

4. Do you have the tape?

5. I have the tape and the CD.

6. I need a new tape too.

7. I'm going to the club.

8. There is a nice club over there.

9. He goes to the club to dance.
10. I want to buy a cube.
11. The cube is black.
12. He'll buy the cube tomorrow.
13. I have a cat.
14. Would you like a cat or a dog?
15. The cat looked sad.
16. You are late.
17. He is late every day.
18. You can't be late today.
19. He is mad.
20. I am mad about you.
21. Mad people go there.
22. Where is it made?
23. It is made of glass.
24. I made some coffee.
25. See you next week.

26. This is the best week ever.
27. This week may be sunny.
28. What can I take?
29. I can take a photo.
30. They take the bus to school.
31. I bought a bag.
32. I forgot my bag again.
33. The bag can be mine.
34. It is a nice roof.
35. Paint the roof and the walls.
36. The roof has a problem.
37. I saw your wife.
38. His wife is working.
39. My wife left last week.
40. Who do you love?
41. I love all kinds of food.
42. Your love can help people.

43. I read one page.

44. I write a page every day.

45. Open your book to page ten.

46. He cleans this room.

47. The room is nice.

48. I reserved a room for you.

49. What is your name?

50. I can't read the name again.

51. His name can't be correct.

52. Can you clean?

53. He is going to clean everything.

54. It is a clean house.

55. The weather is fine.

56. He is a fine actor.

57. The police officer is a fine person.

58. Does he sing?

59. They sing every weekend.

60. I can sing something nice.

61. I saw a vit.

62. The vit is open.

63. A vit can be there.

64. They can sid.

65. The boys sid every day.

66. They sid for life.

67. He has a pite.

68. The pite and the car are nice.

69. Bring the pite now.

70. Do dogs mide?

71. The ladies mide and cry.

72. The train will mide to the city.

73. I can't see the gock.

74. The gock is mine.

75. They need the gock now.

76. We want to sike.

77. They sike every day.

78. I will sike some for you.

Appendix D

PERCEPTION TEST

Target words for the Perception Test

- Criteria to select the words:

1. one or two syllables
2. same consonants that were used in the pretest
3. “perfect” minimal pairs (one word ending in a final consonant and a minimal pair ending in the same consonant followed by “–y” or “–ie”)
4. target consonant is preceded by a vowel
5. no cluster not permitted in PB

- Carrier sentence:

Say ……. now.
(Context: target word is followed by a consonant)

- Triads: Students listen to 3 sentences and check the sentence that is different. Check “a”, if the first sentence is different, “b”, if the second sentence is different, “c” if the third sentence is different, or “the same”, if the 3 sentences are the same.

	A	B	C	The same	Total of sets	Total of sentences
Target consonants	8	8	8		24	72
Distracters	2	2	2		6	18
Catch trials				8	8	24
Total	10	10	10	8	38	114

Total of target sounds: 12 C# tested 3 times: 3*12=36; 12 Ci tested 3 times: 3*12=36) Total=72
Total of target words: 12 C# tested 3 times 3*12=36; 12 Ci tested 3 times: 3*12=36) Total=72
Total of sets of sentences with target words = 24
Total of sets of sentences with distracters = 6
Total of sets of sentences with catch-trials = 2 (using the distracters); 6 (target consonants)
Total of sets of sentences for practice session = 3

Chart with information about the native speaker listeners:

	Age	origin	Other languages spoken	Speakers' status	scores
Listener 1 (Priya)	35	Sri-Lanka (English is an official L2) (from 5 to 11 years old: lived in the US; 11-30 (Sri-Lanka); 32-33 (USA: MA); 33-35 (Sri-Lanka); 35- (USA: PhD)	Sinhala (L1)	Bilingual (Sinhala/ English)	Practice: 2 Test: 37*

Listener 2 (Marianne)	Over 60	Chicago (moved to LA when was about 20 years old)	French and German	Native Speaker of AE	Practice: 2 Test: 37*

* Both listeners failed to hear the contrast between "Say cow now"/"Say cowl now".

Words containing the target consonants:

/p/	/b/	/t/	/d/	/k/	/g/
sop	Cab	sit	mud	duck	dog
soppy	Cabby	city	muddy	ducky	doggy

/f/	/v/	/dʒ/	/m/	/n/	/ŋ/
cough	Move	cage	Tom	rain	ding
coffee	Movie	cagey	Tommy	rainy	dinghy

Distracters: Sentences containing minimal pairs that contrast different types of vowel and consonants.
Catch trials: target and non-target consonants in sets where all the target words are the same:

Wish	row (C#) non-target
Witch	math (C#) non-target
Cash	mock (C#) target
Catch	lucky (Ci) target
Cow	pot (C#) target
Cowl	Betty (Ci) target
Mad	chip (C#) target
Made	nappy (Ci) target

Hare	
Rare	
Chick	
Tick	

LIST OF SENTENCES CONTAINING THE TARGET WORDS AND THE DISTRACTERS

Practice Session:

1.	Say *soap* now.
2.	Say *soup* now.
3.	Say *goal* now.
4.	Say *go* now.
5.	Say *hide* now.
5.	Say *ride* now.

Perception test: Native Speaker Recording Script

	Age	Origin	Other languages spoken	Speaker' status
Recorded by Anna	35	Long Beach, CA	Spanish (foreign language: parents' language, but not used as the family language, only learned after 22)	Native Speaker of English

Record the following sentences. Make sure you:
(a) Read any information included in parenthesis;
(b) Say the number of each set of sentences and the letter of each sentence;
(c) Stop for 5 seconds after each set of sentences;

(d) Do not make a flap in the pronunciation of words ending in –(r)ty or –(r)dy (e.g., *city*, *kitty*, *daddy*)

PERCEPTION TEST (**non-randomized version**)
(Beginning of test)

/p/	/b/	/t/	/d/	/k/	/g/
sop	Cab	sit	mud	duck	dog
soppy	Cabby	city	muddy	ducky	doggy

/f/	/v/	/dʒ/	/m/	/n/	/ŋ/
cough	Move	cage	Tom	rain	ding
coffee	Movie	cagey	Tommy	rainy	dinghy

1. a. Say soppy now.
   b. Say s*op* now.
   c. Say *soppy* now.

2. a. Say *sop* now.
   b. Say *sop* now.
   c. Say *soppy* now.

3. a. Say *cab* now.
   b. Say *cab* now.
   c. Say *cabby* now.

4. a. Say *cab* now.
   b. Say ca*bby* now.
   c. Say *cabby* now.

5. a. Say *city* now.
   b. Say *sit* now.

c. Say *sit* now.

6. a. Say *city* now.
   b. Say s*it* now.
   c. Say *city* now.

7. a. Say *muddy* now.
   b. Say *mud* now.
   c. Say *muddy* now.

8. a. Say *muddy* now.
   b. Say *mud* now.
   c. Say *mud* now.

9. a. Say *duck* now.
   b. Say *duck* now.
   c. Say *ducky* now.

10. a. Say duck now.
    b. Say *ducky* now.
    c. Say *ducky* now.

11. a. Say *dog* now.
    b. Say *doggy* now.
    c. Say *doggy* now.

12. a. Say *dog* now.
    b. Say *doggy* now.
    c. Say *dog* now.

13. a. Say *cough* now.
    b. Say *coffee* now.
    c. Say *coffee* now.

14. a. Say *cough* now.
    b. Say *cough* now.
    c. Say *coffee* now.

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

16. a. Say *movie* now.
    b. Say m*ovie* now.
    c. Say *move* now.

17. a. Say cag*ey* now.
    b. Say *cage* now.
    c. Say *cagey* now.

18. a. Say *cagey* now.
    b. Say *cage* now.
    c. Say *cage* now.

19. a. Say *Tom* now.
    b. Say *Tom* now.
    c. Say *Tommy* now.

20. a. Say *Tom* now.
    b. Say *Tommy* now.
    c. Say *Tommy* now.

21. a. Say *rain* now.
    b. Say *rainy* now.
    c. Say *rain* now.

22. a. Say *rainy* now.
    b. Say *rainy* now.
    c. Say *rain* now.

23. a. Say *dinghy* now.
    b. Say *ding* now.
    c. Say *dinghy* now.

24. a. Say *ding* now.
    b. Say *ding* now.
    c. Say *dinghy* now.

25. a. Say *wish* now.
    b. Say *wish* now.
    c. Say *witch* now.

26. a. Say *mad* now.
    b. Say *made* now.
    c. Say *made* now.

27. a. Say *catch* now.
    b. Say *cash* now.
    c. Say *cash* now.

28. a. Say *cow* now.
    b. Say *cowl* now.
    c. Say *cowl* now.

29. a. Say *chick* now.
    b. Say *tick* now.
    c. Say *chick* now.

30. a. Say *rare* now.
    b. Say *rare* now.

c. Say *hare* now.

31. a. Say *pot* now.
b. Say *pot* now.
c. Say *pot* now.

32. a. Say *Betty* now.
b. Say *Betty* now.
c. Say *Betty* now.

33. a. Say *chip* now.
b. Say *chip* now.
c. Say *chip* now.

34. a. Say *nappy* now.
b. Say *nappy* now.
c. Say *nappy* now.

35. a. Say *mock* now.
b. Say *mock* now.
c. Say *mock* now.

36. a. Say l*ucky* now.
b. Say *lucky* now.
c. Say *lucky* now.

37. a. Say *math* now.
b. Say *math* now.
c. Say *math* now.

38. a. Say *row* now.
b. Say *row* now.
c. Say *row* now.

Perception Test: Randomized version recorded by a native speaker

Practice Session

1. a. Say *soap* now.
   b. Say *soap* now.
   c. Say *soup* now.

2. a. Say *goal* now.
   b. Say *go* now.
   c. Say *goal* now.

3. a. Say *hide* now.
   b. Say *hide* now.
   c. Say *hide* now.

(Begin test)

1. a. Say *wish* now.
   b. Say *wish* now.
   c. Say *witch* now.

2. a. Say *chip* now.
   b. Say *chip* now.
   c. Say *chip* now.

3 a. Say *dog* now.
   b. Say *doggy* now.
   c. Say *doggy* now.

4. a. Say *duck* now.
   b. Say *duck* now.
   c. Say *ducky* now.

5 a. Say *dinghy* now.
   b. Say *ding* now.
   c. Say *dinghy* now.

6 a. Say *cab* now.
   b. Say *cab* now.
   c. Say *cabby* now.

7. a. Say soppy now.
   b. Say s*op* now.
   c. Say *soppy* now.

8. a. Say *city* now.
   b. Say *sit* now.
   c. Say *sit* now.

9. a. Say *cough* now.
   b. Say *coffee* now.
   c. Say *coffee* now.

10. a. Say *pot* now.
    b. Say *pot* now.
    c. Say *pot* now.

11. a. Say *muddy* now.
    b. Say *mud* now.
    c. Say *muddy* now.

12. a. Say *sop* now.
    b. Say *sop* now.

c. Say *soppy* now.

13. a. Say *catch* now.
b. Say *cash* now.
c. Say *cash* now.

14. a. Say *cab* now.
b. Say ca*bby* now.
c. Say *cabby* now.

15. a. Say *city* now.
b. Say s*it* now.
c. Say *city* now.

16. a. Say *lucky* now.
b. Say *lucky* now.
c. Say *lucky* now.

17. a. Say *rain* now.
b. Say *rainy* now.
c. Say *rain* now.

18. a. Say *Tom* now.
b. Say *Tom* now.
c. Say *Tommy* now.

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

20. a. Say duck now.
b. Say *ducky* now.
c. Say *ducky* now.

21. a. Say cag*ey* now.
    b. Say *cage* now.
    c. Say *cagey* now.

22. a. Say *math* now.
    b. Say *math* now.
    c. Say *math* now.

23. a. Say *dog* now.
    b. Say *doggy* now.
    c. Say *dog* now.

24. a. Say *muddy* now.
    b. Say *mud* now.
    c. Say *mud* now.

25. a. Say *cough* now.
    b. Say *cough* now.
    c. Say *coffee* now.

26. a. Say *mad* now.
    b. Say *made* now.
    c. Say *made* now.

27. a. Say *nappy* now.
    b. Say *nappy* now.
    c. Say *nappy* now.

28. a. Say *Tom* now.
    b. Say *Tommy* now.
    c. Say *Tommy* now.

29. a. Say *cowl* now.
    b. Say *cow* now.

c. Say cowl now.

30. a. Say *cagey* now.
b. Say *cage* now.
c. Say *cage* now.

31. a. Say *movie* now.
b. Say m*ovie* now.
c. Say *move* now.

32. a. Say *row* now.
b. Say *row* now.
c. Say *row* now.

33. a. Say *chick* now.
b. Say *tick* now.
c. Say *chick* now.

34. a. Say *ding* now.
b. Say *ding* now.
c. Say *dinghy* now.

35. a. Say *rainy* now.
b. Say *rainy* now.
c. Say *rain* now.

36. a. Say *mock* now.
b. Say *mock* now.
c. Say *mock* now.

37. a. Say *Betty* now.
b. Say *Betty* now.
c. Say *Betty* now.

38. a. Say *rare* now.
    b. Say *rare* now.
    c. Say *hare* now.

(End of test)

Answer-Key forms

Ouça 34 grupos de 3 frases e circule a frase que for diferente. Circule "a", se a primeira frase for diferente, "b", se a segunda frase for diferente, "c", se a terceira frase for diferente. Circule "todas iguais", se as 3 frases forem iguais.

1.	A	b	c	todas iguais
2.	A	b	c	todas iguais
3.	A	b	c	todas iguais
4.	A	b	c	todas iguais
5.	A	b	c	todas iguais
6.	A	b	c	todas iguais
7.	A	b	c	todas iguais
8.	A	b	c	todas iguais
9.	A	b	c	todas iguais

10.	A	b	c	todas iguais
11.	A	b	c	todas iguais
12.	A	b	c	todas iguais
13.	A	b	c	todas iguais
14.	A	b	c	todas iguais
15.	A	b	c	todas iguais
16.	A	b	c	todas iguais
17.	A	b	c	todas iguais
18.	A	b	c	todas iguais
19.	A	b	c	todas iguais
20.	A	b	c	todas iguais
21.	A	b	c	todas iguais
22.	A	b	c	todas iguais
23.	A	b	c	todas iguais
24.	A	b	c	todas iguais
25.	A	b	c	todas iguais
26.	A	b	c	todas iguais

27.	A	b	c	todas iguais
28.	A	b	c	todas iguais
29.	A	b	c	todas iguais
30.	A	b	c	todas iguais
31.	A	b	c	todas iguais
32.	A	b	c	todas iguais
33.	A	b	c	todas iguais
34.	A	b	c	todas iguais
35.	A	b	c	todas iguais
36.	A	b	C	todas iguais
37.	A	b	C	todas iguais
38.	A	b	C	todas iguais

Appendix E

Pronunciation Manual
Designed to accompany the book New Interchange I (Richards et al, 2002
Extracurricular Courses – UFSC
Rosane Silveira/2002

TABLE OF CONTENTS

Tasks, vocabulary field, and related units from New Interchange I

Unit 1. The Syllable (1)

Ouça as palavras abaixo e verifique o número de sílabas em cada uma delas:

car	name	begin	student	eleven	understanding
(1)	(1)	(2)	(2)	(3)	(4)

✓ Dica: Para contar as sílabas, preste atenção no número de vogais que são pronunciadas. Lembre-se de que nem toda vogal escrita é pronunciada.

a) Agora complete o quadro abaixo:

	Número de vogais escritas	Número de sílabas
house	3	1
door		
June		
July		
January		
Friday		
spring		
give		

b) Ouça as palavras abaixo e classifique-as de acordo com o número de sílabas. Em seguida, pratique a pronúncia das palavras.

smoke	snow	foggy	smoky	sex
snowy	mood	dirty	wind	rainy
ease	cloud	windy	easy	fog

dirt	rain	cloudy	sexy	moody

One syllable	Two syllables

c) Ditado: A professora irá ditar 10 palavras do exercício (b). Tome nota.

....
....
....
.....

d) Pair Work: Cada aluno escolhe 5 palavras do exercício (b) e as dita para um colega.

....
....
....
.....

e) Complete as frases com a palavra apropriada.
What's the weather like?

	It's …… .

	It's …… .
	It's …… .
	It's …… .
	It's …… .

f) Discuta estas frases com um colega. Elas são verdadeiras ou falsas? Corrija a informação falsa.

⇨ In Brazil, …

- The weather is always snowy in the winter.
- The rain can cause floods.
- The biggest city is foggy.
- In the northeast, the weather is always cloudy.

- In the north, we have lots of rainy days.

- In the south, we can see snow, sometimes.

g) Você tem que fazer a previsão do tempo na TV. Com um colega, descreva o tempo previsto para hoje, de acordo com o mapa abaixo. Grave sua previsão do tempo.

.....
.....
.....
.....
.....
.....

Unit 2. The Syllable (2)

⇨ Na unidade anterior você viu como se contam as sílabas em inglês. Você percebeu como a letra <e> no final das palavras geralmente não é pronunciada?

(1) name late same page June

São raras as palavras em que se pronuncia o <e> final:

(2) be me see gee knee

Por que a letra <e> tem que ser pronunciado nas palavras em (2)?
.....

→ Você deve estar se perguntando: "Se o <e> não é pronunciado em algumas palavras, por que ele aparece na forma escrita das mesmas?" Ouça as palavras em (3) e tente encontrar uma explicação juntamente com um colega:
.....

(3)

A	B	A	B
mad	made	mat	mate
at	ate	fin	fine
pin	pine	cut	cute
bit	bite	tap	tape

- Nas palavras das colunas "B", as vogais são pronunciadas como no alfabeto em inglês (a, e, i, o, u). Como se ensina para as crianças que estão sendo alfabetizadas em inglês:

"The letter says its name."

a) Repita as palavras em (3). Depois, pratique-as com um colega. Você diz uma das palavras das colunas A ou B e seu colega circula a palavra que ouvir.

⇨ Responda: quantas sílabas têm as palavras em (1) e (2)?
.....

É importante lembrar que o <y> deve ser pronunciado no final das palavras:

(4) many any sixty July

Como já vimos na unidade 2, quando se acrescenta o <y> a alguns substantivos, podemos formar adjetivos:

(5) sun(ny) cloud(y) rain(y) sex(y)

Quantas sílabas têm as palavras em (4) e (5)?
.....

Ouça as palavras em (6) e discuta com um colega a seguinte pergunta:
Por que é importante pronunciar o <y> no final das palavras? .....
.....

(6)

A	B	A	B
sit	city	blood	bloody
men	many	noise	noisy
ice	icy	sleep	sleepy

sex	sexy	luck	lucky
dirt	dirty	fun	funny

b) Repita as palavras em (6). Depois, pratique-as com um colega. Você diz uma das palavras das colunas A ou B e seu colega circula a palavra que ouvir.

c) Ouça as sentenças e complete-as com a palavra apropriada:

sleep/sleepy	sun/sunny	blood/bloody
sit/city	men/many	dirt/dirty

1. It's getting late. Are you ……..?
2. It's a lovely ……. day. We can go to the beach.
3. Do you live in New York …….?
4. I like these …….. . They are very polite.
5. Your room is …… . Why don't you clean it?
6. I am tired. I want to ……. down. Can I use this chair?

d) Pair Work: Leia o diálogo na página 13 (*New Interchange*, exercício 11). Preste atenção na pronúncia do <e> e do <y> no final das palavras. Depois, complete o quadro com algumas palavras que terminem com as letras <e> ou <y> e pratique-as com um colega.

-e	-y

e) Group Work (2 pares): Um par desafia o outro. Quantas frases vocês conseguem completar? Preste atenção na pronúncia das palavras que serão usadas para completar as sentenças. Use palavras que praticamos nas unidades 1 e 2. Confira as respostas no cartão que a professora irá fornecer[1].

Par A	Par B
1. You go to the beach on a …… day.	1. Do you live in a …… or an apartment?
2. You can ……. on a chair.	2. Do you feel …… after lunch?
3. How …… brothers do you have?	3. What …….. do you wake up in the morning?
4. Do you ……. at the university?	4. Are you a ……. person? Do you make people laugh?
5. Would you ……. some coffee?	5. What is your …… number?

f) Pair Work: É o primeiro dia de aula de Kate and Jimmy. Prepare um diálogo usando a informação dos quadros abaixo. Depois pratique o diálogo.

Kate
is from France studies Geography parents live in Nice

Jimmy
is from Italy studies language parents live in Rome.

.....

.....

.....

.....

.....

1 Answer-key fowwwwwr exercise (e) - Pair A: (1) sunny, (2) sit, (3) many, (4) study, (5) like. Pair B: (1) house, (2) sleepy, (3) time, (4) funny, (5) phone.

⇨ A letra <y> também pode ser usada com substantivos para dar um tom afetuoso ou familiar às palavras em inglês. Geralmente as crianças, ou mesmo adultos falando com crianças, usam essa forma:

(7) doggy (dog) birdy (bird) fishy (fish)
mommy (mom) daddy (dad)

f) Ouça o diálogo e sublinhe as expressões onde o <y> é usado para dar um tom afetuoso:

(A mother telling a story to a little child)

Mother:
Once upon a time there was a little birdy called Tweety. The birdy was very sad because its mommy had disappeared. Tweety was crying by the river when a doggy came and talked to it. The doggy asked Tweety why he was so sad, and Tweety explained that it had lost his mommy. (…)

h) Agora ouça algumas frases e verifique se elas têm um tom afetuoso ou neutro. Complete as frases com a palavra apropriada:

dog	doggy	bird	birdy	cute	fish	cutie	fishy

1. I like my ……. .
2. Do you have a ……. ?
3. It's a nice …… .
4. You are so …… .

Unit 3

/ʒ/ e /dʒ/

/ʒ/	/dʒ/
pleasure	passage
massage	journal

a) Ouça as palavras do quadro à direita e diga quais possuem os sons /ʒ/ ou /dʒ/:

/ʒ/	/dʒ/

vision, page, beige
age, television, judge
gentleman, message,
jeans, massage, jeep

b) Quais são os meses do ano que contêm o som /dʒ/?

.....

c) Você sabe qual o continente que contém o som /ʒ/?

.....

d) Ouça as sentenças abaixo. Circule as palavras que contêm o som /ʒ/ e sublinhe as que contêm os som /dʒ/.

- I have a message for you.
- My car is broken. I sent it to a garage[2].
- Jimmy wrote two pages yesterday.
- It's my pleasure.

2 This word can be pronounced differently.

- The bus passes over the bridge.
- Underage people cannot drive.
- I am very stressed. I need a massage.

e) Complete as lacunas com uma palavra apropriada:

garage	age	message	beige
page	bridge	fridge	judge

- A man called you and left a …….. .
- Please, put the food in the …….. .
- The book is missing a …….. .
- I'm going to pick up my car at the …….. .
- I bought a …… shirt.
- There was a car accident on the …… .
- You use the question "How old are you?" to ask about people's …… .
- The ……. decided to send the thief to prison.

f) George e Marge estão se encontrando pela primeira vez. Escreva um diálogo entre eles usando a informação abaixo. Em seguida, grave o seu diálogo.

George
- is from Australia - studies engineering - father: works in a garage; - mother: plays bridge twice a week with friends

Marge
- is from Germany - studies language - father: judge - mother: language teacher

.....
.....
.....
.....

Unit 4

/v/ /f/

a) Ouças as palavras abaixo.

/f/		/v/	
coffee	life	save	love
knife	leaf	leave	believe
enough	wife	above	five

b) Repita as palavras em (a).

- Em inglês há algumas palavras que formam o plural alterando a letra <f> para <e> e acrescentando <–es>.

c) Siga o exemplo e dê o plural das palavras abaixo.

leaf	leaves.....
wife	……
knife	……
life	……
shelf	……
loaf	……
half	……

d) Ouça as palavras do exercício anterior e pratique-as.

⇨ Quantas sílabas têm as palavras do exercício (c)? .....

e) Complete as frases com uma das palavras do exercício (c).

1 In the fall, the trees lose their ..... .
2 I'd like to have three …… of bread, please.
3 Can you put the book on the …….. ?
4 I cut my finger with a …… .
5 The man called his ……. and told her he had to work until late.
6 A cat can have many …… .

f) Pair work: Coloque as frases abaixo no plural e leia-as para seu colega.

Ex.:	The car is black.	⇒	The cars are black
	I read a book	⇒	I read some books

Student A

The wife is sad. ……..……..
The knife is broken. …….
I eat a loaf of bread every day. …..…….……..
The police officer saved a life. ……

Student B

I can buy a new shelf. ……
The leaf is green. ……..
I read one page every day. …….
The picture is above the TV. …….

g) Pratique a pronúncia das palavras abaixo.

active	provocative	negative	meditative
talkative	creative	positive	brave
passive	aggressive	persuasive	sensitive

h) Pair-work: Leia as descrições das pessoas abaixo e decida qual a profissão ideal para cada uma delas, usando a informação no quadro do exercício (i).

1. Jeff likes working in an office. He's talkative and aggressive.

2. Jeff can be a/an…… .

3. Olav likes writing. He's meditative.

4. Olav can be …….. .

5. Eve wants a safe job. She's passive and doesn't like aggressive people. Eve can …….. .

6. Cliff likes adventure. He's active and brave.

7. Cliff ……. .

i) Pair-work: Observe as profissões no quadro abaixo. Em seguida, escolha alguns dos adjetivos em (g) para descrever qualidades importantes para 6 dessas profissões.

doctor	police officer	thief	sales person
housewife	journalist	actor	flight attendant
lawyer	writer	psychologist	life guard

Ex.: flight attendant: A flight attendant has to be brave.

Unit 5

/b/ /d/ /g/

Os sons /b/, /d/ e /g/ normalmente são parcialmente pronunciadas no final das palavras. Ouça os exemplos:

(1) bag club food egg bed mad

Agora pratique as palavras em (1).
y

a) Pair Work: Discuta com seu colega e tente completar o quadro abaixo.

2 adjetivos que terminem com o som /d/	2 nomes de animais que terminem com o som /g/	2 palavras que terminem com o som /b/

b) Ouça os pares abaixo e circule a palavra que você ouvir:

A	B
fool	food
row	road
low	lobe
sigh	side

A	B
see	seed
bay	babe
may	made
soul	sold

c) Ouça os diálogos abaixo e pratique-os com um colega. Preste atenção na pronúncia das palavras sublinhadas.

Dialog 1: A: Do you have a job?
B: Yes, I do. I work in a fast food restaurant.

Dailog 2: A: Are you mad at me?
B: No, I'm just feeling sad.

Dialog 3: A: Where is your bag?
B: It's on my bed.

Dialog 4: A: Are you going to the club today?
B: No, I'm not. I'm going to stay in my bed.

d) Ouça a música "Your song" e complete a letra com as palavras abaixo. Depois, pratique a pronúncia das mesmas palavras com um colega.

did	done	mind	hide
big	world	man	roof
I've	inside	could	thing

Your Song
Elton John/Rod Stewart

1. It's a little bit funny this feeling (a) …….
2. I'm not one of those who can easily (b) ……..
3. I don't have much money but boy if I (c) …….
4. I'd buy a (d) ……house where we both (e) …… live
5. If I was a sculptor, but then again, no
6. Or a (f) …….. who makes potions in a travelling show

7. I know it's not much but it's the best I can do
8. My gift is my song and this one's for you
9. And you can tell everybody this is your song
10. It may be quite simple but now that it's (g) ……
11. I hope you don't (h) ……,
12. I hope you don't mind that I put down in words
13. How wonderful life is while you're in the (i) ……
14. I sat on the (j)…….and kicked off the moss
15. Well a few of the verses well they've got me quite cross
16. But the sun's been quite kind while I wrote this song
17. It's for people like you that keep it turned on
18. So excuse me forgetting but these things I do
19. You see (k) ……forgotten if they're green or they're blue
20. Anyway the (l) …… is what I really mean
21. Yours are the sweetest eyes I've ever seen

e) Group Work (3 alunos): Discuta com seus colegas para encontrar o oposto das palavras abaixo e relacione as colunas. Preste atenção na pronúncia dos sons /b/, /d/ e /g/

Exemplo: A: What's the opposite of "rich"?
B: It's "poor".

( ) old	a. hot
( ) good	b. happy
( ) big	c. alive
( ) cold	d. young
( ) sad	e. bad
( ) dead	f. small
( ) stupid	g. soft
( ) hard	h. lazy
( ) hard-working	i. intelligent

f) Observe as gravuras que a professora vai entregar e use alguns dos adjetivos em (e) para descrever as pessoas:

Ex.: He's patient. She's tired. They're happy.

Unit 6

/p/, /t/, /k/

Ouça as palavras abaixo:

/p/	/t/	/k/
pat	teach	car
paper	attention	key

⇨ Como você pronuncia estas palavras em português?

(1) Portugal total Cuba

Agora ouça a pronúncia das palavras em (1) em inglês. Você percebeu como os sons /p/, /t/ e /k/ são pronunciadas no início das 3 palavras em inglês?

Ouça mais algumas palavras contendo os sons /p/, /t/ e /k/:

(2)

pay	campus	talk	attack	can	become
park	paper	tape	continue	key	accuse
page	happy	table	elected	come	occasion

✓ Dica: Para pronunciar os sons /p/, /t/ e /k/ no início das sílabas acentuadas em inglês, precisamos soltar o ar com bastante força (aspiração). Pratique os sons "aspirados" seguindo a orientação do professor.

✓ Note que no final das palavras os sons /p/, /t/ e /k/ também podem ser aspirados (inglês britânico). Na maioria das vezes, porém, estes sons não são completamente pronunciados (inglês americano).

Ouça as palavras abaixo e preste atenção nas possíveis pronúncias dos sons aspirados em final de palavra.

Aspirados	**Parcialmente pronunciados**	**Aspirados**	**Parcialmente pronunciados**	**Aspirados**	**Parcialmente pronunciados**
soap keep	soap keep	cake back	cake back	fat sit	fat sit

✓ Nos outros contextos, os sons /p/, /t/ e /k/ não são aspirados, ou seja, são muito parecidos com os equivalentes em português. Confira as palavras em (3):

(3) simple rapid doctor actor soccer liquid

a) O que as palavras abaixo têm em comum?

white	violet	pink	purple	black

Com um colega, decida qual das palavras acima pode ter sons aspirados ou parcialmente pronunciados. Algumas palavras podem ser usadas mais de uma vez.

Aspirado	**Parcialmente pronunciado**
/p/	/p/
/t/	/t/
/k/	/k/

b) Ouça mais algumas palavras e diga se as consoantes sublinhadas são aspiradas ou parcialmente pronunciadas.

	Aspirada	**Parcialmente pronunciada**
Exemplo: photography	✓	
1. mechanic		
2. particular		
3. cook		
4. make		
5. potato		
6. cup		
7. total		
8. stop		
9. take		
10. cut		

c) Ouça as palavras abaixo e circule a que você ouvir.

A	B	A	B
side	site	be	beat
play	plate	code	coat
buy	bite	cab	cap

lie	like	key	keep
May	make	"k"	cake

d) Circule a frase que você ouvir.

1. a) Come to this side.
   b) Come to this site.

2. a) The play is interesting.
   b) The plate is interesting.

3. a) I can buy it.
   b) I can bite it.

4. a) I want to be you.
   b) I want to *beat* **you.**

5. a) He likes the code.
   b) He likes the coat.

6. a) She has a cab.
   b) She has a cap.

e) Complete as sentenças com a palavra apropriada. Pratique-as com um colega.

like	paper	talk	cook	keep	take
pages	sit	tape	cake	hot	make

- Please, be quiet. Don't …….. here.
- I read 10 …….. of my book.
- Do you ……. watching TV?
- –Can you ……. well? –No, I'm a terrible cook.

- Do you have a piece of …….? I have to write something.

- I love to eat chocolate …….. .

- Please, …….. down on this chair.

- Do you have a ……. recorder?

- Can you ……. a secret?

- It's …….. today. It's 40ºC.

- Would you like me to …….. a photo of you?

- You can't …… a mistake now.

f) Pair Work: Decida quais dos verbos da primeira coluna podem ser usados com as expressões da segunda coluna (para alguns verbos, há mais de uma alternativa). Em seguida, faça frases como as do exemplo.

Example: You can <u>stop a bus</u>.

▪ stop	a) a bus
▪ look	b) a coke
▪ make	c) on a chair
▪ type	d) a job
▪ smoke	e) a secret
▪ bite	f) a finger
▪ quit	g) an apple
▪ keep	h) a mistake

▪ sit	i) a letter
▪ drink	j) happy

⇨ Confira suas respostas com a professora.

g) Ouça a música "I say a little prayer" e retire algumas palavras para completar cada coluna do quadro abaixo. Algumas colunas podem ficar em branco. Pratique as palavras com um colega.

Aspirado			**Parcialmente pronunciado**		
/p/	/t/	k/	/p/	/t/	/k/
Ex.: *peace*	tell	car	Top	pat	clock

I Say A Little Prayer (The cast of *My Best Friend's Wedding*)

1. The moment I wake up
2. Before I put on my makeup
3. I say a little prayer for you
4. While combing my hair now
5. And wondering what dress to wear now
6. I say a little prayer for you
7. Forever and ever
8. You'll stay in my heart
9. And I will love you
10. Forever and ever
21. And all through my coffee break time
22. I say a little prayer for you
23. Forever and ever
24. You'll stay in my heart
25. And I will love you
26. Forever and ever
27. We never will part
28. Oh how I'll love you
29. Together, forever
30. That's how it will be

11. We never will part
12. Oh how I'll love you
13. Together, forever
14. That's how it should be
15. To live without you
16. Would only mean heartbreak for me
17. I run for the bus dear
18. While riding it I think of us dear
19. I say a little prayer for you
20. At work I just take time
31. To live without you
32. Would only mean heartbreak for me
33. My darling believe me
34. For me there is no one
35. But you
36. Please love me too
37. I'm in love with you
38. Answer my prayer

ACKNOWLEDGEMENT OF EXERCISES

2(e): Adapted from Watcyn-Jones (1982).
8(e): Adapted from Hewings (1993).

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Appendix F

TIMELINE FOR LANGUE TEACHING APPROACHES AND METHODS

Grammar Translation	1800
Direct Method	1900
Oral Approach	1930
Audiolingualism	1945
Natural Approach	1977
Silent Way	1950
Cognitive Approach	1960s
Community Learnig	1976
Communicative Approach	1980

Rosane Silveira is a faculty member at Universidade Federal de Santa Catarina (UFSC), affiliated with the Department of Foreign Languages and Literature and with the Graduate Program in English. Publishing widely in the field, Silveira conducts and supervises research on English-Portuguese interphonology, and has done postdoctoral work as a visiting scholar at Columbia University (Teachers College) and Concordia University (Education Department).

The Influence of Pronunciation Instruction on the Perception and Production of English Word-Final Consonants by Rosane Silveira is the eleventh volume of the Advanced Research in English Series (ARES), published by the Graduate Program in English (Language and Literary Studies) at Universidade Federal de Santa Catarina (UFSC). It is the result of doctoral research conducted from 2000 to 2004, including a full-year research period at the University of California at Los Angeles (UCLA), under the sponsorship of CAPES, the foundation within the Ministry of Education which coordinates the improvement of higher education in Brazil.
Since 2004, the field of L2 phonology has advanced through the introduction of new research perspectives and variables. With this in mind, Silveira has provided this volume of ARES with a brief overview of the topics covered in the 2007, 2010, and 2013 proceedings of the main international event in the field, namely New Sounds: International Symposium on the Acquisition of Second Language Speech.

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