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**Interweaving Letters and Sounds:
The Impact of Phonics Instruction in English on the Oral
Production and Symbolic Representation of Sounds Among
University-Level L2 English Learners**

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“Give a man a fish and he will eat for a day. But teach a man to fish and he will eat for a lifetime.” With a pronunciation spin on it, the saying becomes, “Teach someone the sounds of a word, and that person can say that word. But teach someone to predict those sounds, and that person can say any word.” (Dickerson, 1994, p. 19)

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Dedication

This thesis is dedicated to my family, my friends, my colleagues, my students and all those who believe that, while not a panacea for all learning problems, explicit instruction can make a difference in L2 English learning.

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Abstract

The study described in this thesis was conducted with a number of L1 Spanish learners of L2 English who were students of English Pronunciation Practice (EPP), an undergraduate pronunciation course taught in English Teaching, Translation and Research programs at Facultad de Lenguas (FL), Universidad Nacional de Córdoba (UNC). It was aimed at investigating whether explicit phonics instruction contributes positively to the oral production and phonemic transcription of unfamiliar words of a number of university-level L1 Spanish learners of L2 English. A quasi-experimental research designed was used and the data obtained were analyzed with a quantitative method. The participating students were divided into experimental and control groups. The total number of students whose performance was analyzed was 62 (experimental = 33 and control = 29). Both groups were pretested on oral production and phonemic transcription of unfamiliar words. Next, the experimental group received a six-lesson phonics instruction focusing on the pronunciation and transcription of six specific orthographic combinations. After that both groups were posttested in terms similar to the pretest. All the data collected were analyzed using the dependent *t* test (also known as *paired t test*) to assess the difference between the averages obtained in the pretest and posttest conditions by each group. This was complemented with a variability analysis conducted to determine the degree of difficulty caused by the different combinations to the participating students. The results obtained from this study confirm the hypothesis that students who received explicit phonics instruction performed better in terms of oral production and phonemic transcription of unfamiliar words containing the orthographic combinations chosen than did students who did not receive such instruction. Pedagogical implications, practical applications and directions for future research are given.

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Chapter 1 Introduction

1.1 The Research Problem

1.1.1 Pronunciation Instruction in L2 English¹

There is no doubt that oral proficiency is one of the desired outcomes of English Language Teaching programs at university. Achieving a high level of oral performance depends, to a great extent, on the development of pronunciation skills. Pronunciation instruction is often provided in stand-alone courses structured in terms of proficiency levels and designed to meet specific learning objectives. Depending on the level, learners are taught segmental and suprasegmental phenomena. Among the different pronunciation features, particular attention is paid to vowel and consonant production, weak and strong forms of pronunciation, simplification features in connected speech, word stress, rhythm, and intonation. As learning advances, students are expected to achieve not only higher and higher levels of accurate micro-level oral production – including segmental and suprasegmental features – but also macro-level performance, involving *intelligibility* and *communicability* (see Derwing & Munro, 2005; Morley, 1994).

University pronunciation syllabi have stereotypical constitutive parts. One of the most important components is phonetics training, that is to say, the teaching of articulatory, acoustic and perceptual aspects that are relevant in the production of different features. For example, students are given information about manner and place of articulation of consonant sounds and, occasionally, they are also informed about height of tongue and lip setting for the production of vowel sounds. Phonology, as the component that links sounds to meaning, is also normally addressed. Learners usually receive instruction in the systemic functioning of sounds in a language, with an emphasis on how the stream

¹ The term *L2* or *second language* may refer either to “any language that is acquired after the first language has been established” or to “an additional language which is learned within a context where it is societally dominant and needed for education, employment, and other basic purposes” (Saville-Troike, 2012, p. 204). In the latter sense, the term can be contrasted with *foreign language*, which refers to a language other than the first (L1) studied formally but not used in the students’ social context. In this thesis, such differentiation is not relevant because, even though there are obvious differences in the settings, “whatever psycholinguistic processing takes place in a naturalistic situation presumably takes place in a classroom situation” (Gass & Selinker, 2008, p. 368). Consequently, the terms used throughout this work are *L2*, where no particular second language is involved, and *L2 English* or *ESL* for cases in which English is the focus, regardless of the setting.

of speech can be analyzed into contrastive units, that is, segments “contrasting with other segments to make a change in meaning” (Cruttenden, 2014, p. 4). For instance, in beginning instruction stages, learners are commonly given identification and awareness exercises to appreciate the meaningful differences between such pairs as *cat* /kæt/ and *cut* /kʌt/. Transcription, as the symbolic representation of sounds, is also typically part of pronunciation training at university level. Learners are taught to use specific symbols to represent the stream of speech. Transcription is usually done following established conventions such as those adopted by the International Phonetic Alphabet (IPA). Activities may include transcription of isolated words, phrases, sentences and even whole texts, either from dictation or writing.

As for input, it is considered a major component of instruction and several L2 language development theories highlight its value in L2 language processing and learning (see Doughty & Long, 2003; Long & Doughty, 2009; Piske & Young-Scholten, 2008). As to L2 phonological development, research has shown that both quantity and quality of input are crucial for success in oral production (Celce-Murcia, Brinton, Goodwin, & Griner, 2010). There exists, however, another side to the issue of input that deserves consideration concerning oral production, namely, modality: auditory, visual, and orthographic input (Bassetti, 2008; Colantoni, Steele & Escudero, 2015).

It seems obvious that perceiving and producing oral language is dependent, among other factors, on auditory input. This is the reason why, in terms of pronunciation instruction, a premium is generally placed on listening practice, as it is believed to constitute the primary basis for L2 oral-aural learning. With regard to visual input, it is logical to think that other sources, such as lip movement and hand-arm gestures, can contribute information in oral communication. Actually, in most situations, “speech communication involves *both* visual *and* auditory sources of information” (Hardison, 2010, p. 84, emphasis added). For this reason, drawings and animated diagrams² are sometimes used for learners to study the positions and movements of the organs in the vocal tract that are necessary for the production of speech sounds. In addition, electronic visual displays of pitch contours are becoming a useful tool to supplement the teaching

² A famous online diagram is the one developed as a collaborative project by several departments of the University of Iowa. It is available at <http://soundsofspeech.uiowa.edu/>.

of suprasegmentals, as research has demonstrated that such visualizations can be beneficial for prosody learning (Chun, Hardison & Pennington, 2008).

What may not appear to be so clear, at least *a priori*, is how orthographic input can influence the production and perception of sounds. At this point, it is relevant to note that, in general terms, literacy can affect the way an individual processes not only their L1 but also an L2 (Colantoni, Steele & Escudero, 2015). In connection with orthography, in particular, a number of research studies have found that it can have both positive and negative effects on L2 speech production and perception (Bassetti, 2008; Bassetti, Escudero & Hayes-Harb, 2015; Simon & Van Herreweghe, 2010).

In L2 English pronunciation instruction, while audiovisual sources are given a central role, orthographic information typically receives little or no attention. This is so in spite of the fact that phonetics and phonology reference and resource books generally acknowledge the importance of making spelling-sound associations visible (see, for example, Cruttenden, 2014; Hancock, 2004; Hewings, 2003; Pennington, 1996). In a great number of cases, including the one with which this thesis is concerned, L2 instruction occurs in orthographically-rich environments, which implies that reading is a major source of input. Given the fact that spelling is a potentially facilitating or inhibiting factor in L2 speech³ development, it is critical to closely examine the role of certain reading processes, particularly in terms of how orthography and phonology are intertwined in the identification of lexical items.

1.1.2 Perspectives on Reading

Inasmuch as reading can be conceived as “a complex, multifaceted pursuit” (Koda, 2005, p. 227), it is possible to presuppose that several motivations, functions and processes are involved. One of the ultimate goals of this activity is believed to be comprehension of the message(s) encoded in text. This goal, however, would turn virtually unattainable without the ability to recognize words fairly easily. Therefore, to be successful, reading calls for the combination of word-level information extraction

³ Throughout this work, *L2 speech* is used to refer to L2 pronunciation in general, involving oral production and perception of a range of units, from individual sounds to whole words (see Munro & Bohn, 2007).

with inferencing and the integration of textual information. This amalgamation has not always been reflected in conceptualizations and models of reading.

Along the history of (L2) reading research and pedagogy, diverse models have been proposed to account for the processes and mechanisms participating in the endeavor of decoding and understanding text⁴. One theory influencing reading was psycholinguistics (Unrau & Alvermann, 2013). Enrolled in this theory, some educators and theorists viewed learning to read in much the same way as learning to speak. Besides, readers were thought to engage in some kind of ‘negotiation’, in which their beliefs and prior knowledge were confronted with the text to be read, with a great deal of inferencing and guessing taking place in the process of text interpretation. For this reason, reading was equated with a “psycholinguistic guessing game” (Goodman, 1967, p. 126). In this framework, contextual information was viewed as compensating for the difficulty engendered by English spelling.

A different view of reading was held by cognitivist approaches. Contrary to what had fervently been espoused from the psycholinguistic perspective, it was claimed that learning to read is not natural as is learning to speak. Liberman and Liberman (1992) argued that “[i]n order to develop speech, the normal child need only be in an environment where language is spoken; reading, on the other hand, almost always requires explicit tuition” (p. 345). Another point that clearly differentiates the two perspectives is the conceptualization of reading acquisition as occurring in stages or phases. For example, Ehri (1998, 2005) has proposed the existence of phases in the process of word learning in English, each of them involving a progression in alphabetic mastery until automatization of written word recognition is achieved. Along these lines, cognitively-oriented research has demonstrated that the proper identification of words is essential in learning to read and constitutes a pre-requisite for successful comprehension (Grabe, 2009; Koda, 2005; Perfetti, 1985, 2007). This cognitivist perspective on reading, with a special focus on word recognition, is of interest for this thesis.

⁴ While it is recognized that there exist a wide range of (L2) reading models, emerging from different theories (see Unrau & Alvermann, 2013), reference to all these models is outside the scope of this thesis.

1.1.2.1 Reading as Word Recognition

Over the last decades, cognitive psychology has made great strides in “understand[ing] the psychological *structure* of the human mind and the *processes* by which it operates” (Berscheid & Regan, 2005, p. 228, emphasis in original). In the field of reading, it has focused on print literacy and especially on word recognition processes (Hall, 2010). While cognitive models do not neglect the importance of overall text comprehension, they underscore the significance of word recognition skills as essential in learning to read and a pre-requisite for successful comprehension (Grabe, 2009; Hall, 2010; Koda, 1996, 2005; Perfetti, 1985, 2007). Such skills involve the use of phonology, orthography and morphology in identifying (novel) words visually. Also, in word recognition, there is assumed to be “interactivity among the various types of lexical and semantic structures” (Hall, 2010, p. 8). Thus, in learning to read, individuals start off cracking the written code by making grapho-morpho-phonetic associations and engaging in semantic and vocabulary processing as a springboard for text comprehension. In fact, the relevance of establishing appropriate connections between the graphic representations of words and their phonological identity has become one of the most valuable contributions of cognitivist reading research and has, in turn, been fed back into pedagogy (Birch, 2007; Hall, 2010; Tankersley, 2003). This thesis draws heavily on procedures and findings stemmed from cognitively-oriented models.

1.1.2.2 Reading Modalities: Oral Reading at Issue

An aspect of reading that is important to consider is *modality*. Reading is carried out in at least three modes: silently, subvocally, and orally (Birch, 2007; Pollatsek, 2015). In silent reading, individuals identify the written symbols as letters and match them with the sounds available in their mental store. As Birch (2007) explains, “[t]his creates a visual and aural image of the word, which then undergoes lexical processing to identify and retrieve the word and its correct meaning” (p. 49). There is, obviously, no vocalization and, therefore, no physical sounds are involved. The lack of vocalization, however, does not mean the absence of phonological processing (see, for example, Blythe, Pagán & Dodd, 2015; de Jong, Bitter, van Setten, & Marinus, 2009). Subvocalization is similar to silent reading in the symbol-sound-meaning processing but there is activation of the organs in the vocal tract, to such an extent that readers feel (and possibly look as if) they are saying words which are actually inaudible. Oral reading,

also known as reading aloud, is the mode in which the written words are actually pronounced and can be heard.

Of the three modes, the first one is the quickest and least effortful. In general, readers may go from one mode to the other in the same reading instance and for different reasons. For example, they may be reading silently but engage in subvocalization in presence of an unfamiliar word or say a string of words out loud to fully grasp the meaning of a lexical item, phrase or sentence. In this work, the focus is on reading aloud, since this modality is the one normally used as part of pronunciation instruction. Besides, the tests and the treatment conducted for the study described below were based on this type of reading.

1.1.3 Reading and Pronunciation in L2: English at Stake

The relationship between reading and pronunciation is crucial both in an L1 and an L2. For L1 speakers, early reading stages entail essentially converting print information into sound-meaning relations. Even though the process is not simple and takes a number of years of instruction, these learners have an insurmountable head start: a fully-developed speech system. In fact, most children are constantly exposed to their L1 for about 4 to 6 years before the onset of reading.

For a great number of L2 learners, in contrast, the picture is somewhat different, as learning to read and learning to speak in the L2 occur at around the same time. This means that different skills and diverse sources of input have to be developed and used simultaneously (Colantoni, Steele & Escudero, 2015). Besides, the fact that L2 learners are typically already literate in their L1 is both an advantage and a handicap. On the one hand, all things being equal, by the time L2 learning commences, most individuals have already attained sufficient linguistic knowledge and cognitive skills that may potentially facilitate L2 processing. On the other hand, as Cook (2010) puts it, “everything the [L2] learner acquires and does potentially involves *both* a first *and* a second language” (p. 147, emphasis added). This means that the constant interaction of the two linguistic systems may condition L2 learning in a number of ways. For example, in learning a new sound system, learners may experience difficulties due to the influence that may be exerted by the sounds already available in the L1 (Major, 2008). As regards print

processing, learning L2 letter-sound correspondences may be hindered by L1 orthography-phonology relations (Koda, 2009).

The description of the preceding L2 scenario applies entirely to L2 English, particularly to the learners participating in the study conducted for this thesis. As will be described later, English orthography poses some processing difficulties to speakers of languages such as Spanish, which bears a much simpler orthography-phonology relationship. It is precisely this issue that is taken on board in this study. As is argued repeatedly here, it is considered extremely important that L2 pronunciation training contain a graphophonemic component, which together with phonetic practice and other essential phonological aspects may contribute to the design of an integral pronunciation instruction program. Thus, phonetics and phonology training may be broadened to include not only *production* and *perception*, but also *prediction* from spelling, hence, a 3P trilogy of goals may be pursued (see Dickerson, 1994, 2013, 2015).

1.2 Rationale for the Study

The study described in this thesis was conducted with a number of L1 Spanish learners of L2 English who were students of English Pronunciation Practice (EPP), a pronunciation course taught at Facultad de Lenguas (FL), Universidad Nacional de Córdoba (UNC). At the end of this course, learners are expected to have achieved the following skills: familiarization with the speech production mechanism and the functions of the intervening organs, accurate production of English segments, efficient listening comprehension, development of new articulatory habits, development of oral expression skills that enable them to handle effectively the contents and morpho-syntactic structures used in related courses, effective use of English rhythm and precise written representation of sounds through phonetic transcription⁵.

In order to complete this course successfully, among other requirements, learners need to develop a firm grasp of the key role played by the nature of English orthography. In this respect, they must become aware that the relationship between spelling and pronunciation in English is complex and not straightforward as it tends to be in Spanish. However, the lack of one-to-one correspondence between spelling and pronunciation in

⁵ The term *phonetic transcription* is used generically, as explained in Chapter 2.

English is only one side to the issue under analysis here. It is also true that certain orthographic patternings recur in the language displaying a fairly consistent phonological realization. By way of example, the combination *CVCe* will necessarily take a tense vowel sound, whereas *CVC(C)* will normally be pronounced with a lax vowel sound. A number of errors often observed in these learners' performance, including oral production and transcription, seem to reveal a severe lack of awareness of these relationships. This is probably the result of EPP not including systematic explicit graphophonemic instruction as part of its objectives.

Therefore, by making some graphophonemic combinations explicit in the pronunciation class, learners can better understand how the systems of orthography and phonology interrelate in English and may pronounce and transcribe unfamiliar words successfully on the basis of the valuable information provided by their orthographic configurations. Given that oral reading is a widely used input source, practice activity and testing instrument in EPP, success in English oral production depends in part on accurate graphophonemic decoding when reading. In fact, it is essential to understand that securing grapheme-phoneme relations in memory and retrieving them from it are as important as being able to perceive and pronounce sounds. Thus, the treatment conducted for this thesis can be considered an attempt to address pronunciation problems from an angle that is very little explored in L2 English at university, as it uses a methodology that is foundational in learning to read L1 English⁶.

The work reported in this study deals with the effects of orthography on pronunciation teaching in an L2 English class at university level. More specifically, the study conducted sought to determine if graphophonemic instruction had a positive effect on the oral production and phonetic transcription of unfamiliar words among EPP students. With this purpose in mind, the students were divided into two groups. One of them received graphophonemic lessons specially designed for the study, while the other group did not receive that instruction. The members of each group completed four tests (pre- and post-instruction, both oral and written). For each group, the results of the

⁶ As this thesis draws partly on reading development literature, and in accordance with the terminological tradition in this field, the term mostly used for the instruction proposed here is *phonics*. Alternatively, in particular when explaining its workings or describing it (as is the case in this chapter), the choice shifts to *graphophonemic instruction*. In any case, the two terms should be understood as synonyms.

pretests were compared with those of the posttests to determine if the treatment proposed had improved graphophonemic accuracy in the oral production and the phonetic transcription of unfamiliar words.

1.3 Contents of the Chapters

This thesis is comprised of five chapters. Chapter one, above, presents the research problem situating it at the intersection of L2 English reading and pronunciation instruction. Reference is also made to the motivations for undertaking the study. Chapter two contains the theoretical framework this study is based on and a review of investigations that form the background for the research described below. Chapter three describes the study in all its relevant aspects, namely, context, objectives, hypothesis, methodological design, materials, participants, and statistical analysis. Chapter four presents the results obtained from the analysis and the discussion of the results. Finally, Chapter five summarizes the research findings and concludes with pedagogical implications, the limitations of the study, possible directions for future research, and final considerations.

Chapter 2

Theoretical Framework and Literature Review

This chapter is aimed at presenting the theoretical considerations that underpin the research into the effects of phonics instruction on pronunciation skills and at reviewing related works. This investigation is at the crossroads of two constructs in the vast interdisciplinary area of second language acquisition (SLA), namely, orthography-phonology interconnections, and the role of L2 instruction. These conceptualizations are discussed in turn below. After the discussion of the theoretical issues, a presentation of related studies is provided as the backdrop against which the research was conducted.

2.1 Theoretical Framework

2.1.1. The Orthography-Phonology Interface in L2

As stated by Simon & Van Herreweghe (2010), the relationship between orthography and phonology has been studied in a number of subfields of linguistics. The analysis presented here is based on the contributions made by two specific SLA perspectives: L2 visual word recognition and L2 phonology acquisition.

As was briefly mentioned above, visual word recognition refers to the processes that readers go through in identifying lexical as well as sublexical items, including the “physical distinctions of the letters, identities of letters differing in case, orthographic regularity or probability of letter sequence, and grapheme-phoneme correspondence” (Shiotsu, 2010, p. 24). Over the last decades, a number of models have been proposed not only for L1⁷ but also for L2 reading, particularly from cognitively-oriented perspectives (see Birch, 2007; Grabe, 2009; Koda, 1996, 2005; Norris, 2013; Roberts, Christo & Shefelbine, 2011; among others). Most cognitive theorization agrees that, whether in L1 or L2, automatic word recognition is indispensable for other processes to occur more or less simultaneously.

According to Grabe (2009), “[w]ord-recognition skills must become very rapid and automatized for fluent reading to occur” (p. 27). Thus, if a number of elements are identified through relatively easy, rapid and automatic processing, readers’ attentional

⁷ Most of these models have been proposed for L1 English reading (see Roberts, Christo & Shefelbine, 2011).

resources will be strategically directed to the more demanding, time-consuming, higher-order processes (Grabe, 2009; Lems, 2006; Samuels, 2002). The array of lower-order or bottom-up processing taking place in reading includes orthographic, phonological, morphological, semantic, and syntactic processing, among others. The processing of all these subsystems is required for both L1 and L2 word recognition. Nevertheless, in the latter case, the interaction of two languages in the reader's mind, each with its own linguistic properties, makes cognitive processing particularly challenging (Koda, 2007, 2009). In the last 20 years, research into L2 word recognition has proliferated, with a great deal of attention paid to how the orthographic and phonological systems of the two languages interact. In turn, the evidence garnered has been formalized into theoretical accounts. Some of these accounts are explained in Frost (1998, 2005), Han (2015), Koda (2016), Leong and Joshi (1994), and Yamashita (2013), to name only a few.

In the field of L2 phonology, the past decades have also seen a flourishing of studies and models that attempt to explicate the complexity inherent in the acquisition of an additional speech system, and the influences operating between the languages involved (Arabski & Wojtaszek, 2011; Hansen, 2006; Hansen Edwards & Zampini, 2008; Ioup & Weinberger, 1987). Notwithstanding the profusion of the literature on L2 speech development, it is noteworthy that orthography-phonology connections have been treated marginally (Rafat, 2011; Simon & Van Herreweghe, 2010). This, as several researchers agree (notably Bassetti, Escudero & Hayes-Harb, 2015; Rafat, 2011; and Simon & Van Herreweghe, 2010) may be the cause of the lack of a theory formalizing the role of orthography in L2 pronunciation acquisition. Recently, this theoretical gap seems to have been counteracted by a number of studies showing that orthography can exert a strong influence on the acquisition of L2 speech. Interestingly, most such research has been carried out with a range of L2 languages, such as Chinese (Bassetti, 2007), Italian (Bassetti & Atkinson, 2015), Spanish (Rafat, 2011), Dutch (Escudero & Wanrooij, 2010), German (Young-Scholten & Langer, 2015), and Spanish and Irish (Erdener & Burnham, 2005), among others.

Given the interlocking between orthographic and phonological systems in L2 learning, it is considered relevant to tap into the evidence emerged from these two SLA perspectives, as each can make significant contributions toward unveiling the

complexities emerging from this interfacing. In turn, these contributions can lend support to a pedagogical proposal for teaching pronunciation departing from an analysis of orthographic combinations.

In view of the above discussion, the orthography-phonology interface is developed with a consideration of the following: 1) phonological processing in visual word recognition (with special emphasis on phonological recoding), 2) a transfer model in L2 reading, 3) the role of orthography in L2 speech, and 4) a cross-linguistic comparison of orthography-phonology connections in Spanish and English. While the first three subsections discuss L1 and L2 phenomena in general, with virtually no reference to particular languages, the last subsection is devoted entirely to English and Spanish, the languages involved in the study reported here.

2.1.1.1 Phonological Processing in Detail: Untangling the Oral Substance of Written Language

As stated by several authors (notably Golder & Goanac'h, 2001; O'Shea & Katsafanas, 2009; Share & Stanovich, 1995; Troia, 2004), phonological processing is essential in reading development. This major phonological skill can be defined, in simple terms, as "the ability to use the sounds of the language to process oral and written language globally" (Lesaux, Geva, Koda, Siegel & Shanahan, 2008, p. 29). In speech perception, for example, phonological processing functions in a largely automatic fashion (Troia, 2004), which is probably a result of the inborn capacity of human beings to handle speech (Liberman & Liberman, 1992). Regarding literacy acquisition, this ability is closely associated with the vital connections that need to be made between printed information and the phonological identity it represents.

There are at least three reasons for the examination of phonological processing in this work. First, this processing is believed to be a reading universal; that is, it is supposed to be applied by all readers, regardless of the language (Grabe, 2009). Second, phonology plays a significant role not just in beginning reading but also in well-developed, skilled reading. As has been demonstrated, skilled readers (whether adults or beginners) use phonological information to identify printed words (Ashby, 2010; Ashby & Rayner, 2012). In fact, "phonological processes facilitate word recognition in the first tenth of a

second of seeing a word” (Ashby & Rayner, 2012, p. 61). Third, and most importantly for this thesis, adult L1 Spanish readers of L2 English (even with a few years’ reading experience in the latter language) are likely to use phonological processing in reading unfamiliar words aloud (Pitts & Hanley, 2010). The detailed workings of phonological processing are presented below through a description of its three components or subprocesses, namely, a) phonological memory, b) phonological awareness, and c) phonological recoding (Grabe, 2009; Koda, 2005; Lesaux et al., 2008).

d. Phonological Memory

Phonological memory refers to the ability to identify and recall phonological elements and their sequencing (Baddeley, 2003; O’Brien, Segalowitz, Freed, & Collentine, 2007). This form of processing, as Birch (2007) states, is essential for the completion of diverse cognitive and linguistic tasks. Phonological memory is said to support “language learning by holding novel phonological traces temporarily until more permanent representations can be formed” (O’Brien et al., 2007, p. 559). As affirmed by Baddeley, Gathercole and Papagno (1998), its primary purpose is helping speakers of a language learn new words. The phonological memory skill is supported by a complex system known as *working memory*, which is concerned with how information (of any kind) can be manipulated and stored. Using this multi-component system, readers process verbal items and sequences associating them with particular meanings, retaining them in working memory and retrieving them when necessary. They also establish the grapheme-phoneme relations that will be stored and accessed for reading purposes. Phonological memory skills are, thus, essential for stable representations to be made and, ultimately, for reading abilities to develop.

e. Phonological Awareness

Phonological awareness refers to an individual’s realization that spoken words are made up of sounds. Logical and obvious as this processing component may seem to us, it is definitely not so to pre-readers. Normally, as individuals grow, they develop “implicit phonological knowledge that enables them to gain mastery of speaking and listening to their native language” (Gillon, 2004, p. 2). In fact, developing high-quality perception and production of sounds in individual words is considered of utmost importance for the acquisition of reading (Goswami, 2010a). Phonological awareness has been described as

a “multilevel skill” (Gillon, 2004), as it involves knowledge of different units: *syllable awareness*, *onset-rime awareness* (intra-syllabic) and *phonemic awareness*. For instance, consider the word *trumpet*. A reader can determine that this word is made up of two syllables: *trump-* and *-et*. (syllable awareness). Knowledge of syllable-internal elements could help that person divide the first syllable into *tr-* and *-ump* (onset-[syllable-initial consonant(s)] rime [vowel and final consonant(s)] awareness). Still, that person may be aware that this lexical item is itself comprised of seven discrete phonological elements (phonemic awareness).

Some studies have shown that phonological awareness “undergoes an apparently universal cross-language developmental sequence from larger to smaller units” (Goswami, 2010a, p. 106). Therefore, beginning readers set about by chunking words into syllables, and only when they have succeeded at this can they identify the individual segmental constituents. Nevertheless, this identification is sometimes obscured by the coarticulation of sounds typical of connected speech (Fowler, 2011; Goswami, 2010a). For all these reasons, phonemic awareness, unlike the other types of awareness, is a later development which typically starts with schooling. But the discovery of the existence of phonemes as speech units depends to a large extent on learning an orthographic system. As stated by Goswami (2010a), “[p]honemes are learned via their visual representations as letters” (p. 108). This relationship between the sound and its written representation, with practice, contributes to the development of phonological recoding (Fowler, 2011).

f. Phonological Recoding

Phonological recoding, also known as *decoding* (Share, 1995, 1999, 2011), consists in converting non-phonological, visual-orthographic printed information into its pronounced form (Ehri & Snowling, 2004; Stahl & Murray, 1998). By way of example, while reading (or attempting to read), an individual engages in phonological recoding when applying letter-sound correspondence rules or when using “an analogical mechanism which synthesizes stored information from orthographically related words” (Share, 1999, p. 152). With ever more print experience, reading instruction and vocabulary acquisition, readers are able to develop a more refined knowledge of the complex orthography-phonology relationships. Thus, in the wake of ever-growing

reading experiences, letter-sound associations strengthen and broaden (Share, 2011). Readers make durable connections between these two representational systems, store them in memory, and find correspondence regularities in terms of how orthography maps onto phonology. As a result of this linguistic and cognitive maturation, readers develop graphophonological awareness, or “the insight into the way phonological information is graphically represented in the writing system” (Koda, 2008b, p. 225). In addition, recoding is such an important procedure that it is considered a ‘self-teaching device’ (Share 1995, 1999, 2011), a mechanism which enables readers to go from painstaking decoding of letter strings to quick and effortless recognition of lexical units as familiar.

In addition, and in close connection with the topic discussed in this thesis, recoding constitutes an essential process in pronouncing unfamiliar words, one without which access to visual lexical material may be highly impeded (Cain, 2010; Lesaux et al., 2008). Worthy of note is also the fact that each of the phonological processes explained above, while able to be analyzed as separate phenomena, is said to affect the others in specific ways. In particular, “recoding skill is assumed to reflect...basic underlying cognitive capacities such as phonological memory and phonological awareness” (Share, 2011, p. 53). Besides, and probably most importantly, all three phonological skills “are strongly related across languages” (Snow, 2008, p. 282). This means that speakers can use these skills to assist their language development skills not only in their L1 but also in an L2.

A final aspect to be considered in this subsection pertains to the potential occurrence of phonological processing in the different reading modes described in the introductory chapter. In particular, it is important to know if phonological recoding is a phenomenon exclusive to oral reading or if it takes place across the board. A series of studies applying different methodologies have been conducted in order to find out about this issue. For instance, in an experiment exploring the use of phonological recoding in silent reading, de Jong et al. (2009) confirmed the presence of this processing in this modality and its utility in orthographic learning. Another study carried out with beginning readers arrived at similar conclusions (Bowey & Muller, 2005). A third study using the eye-movement methodology demonstrated that children and adults alike can

engage in successful phonological processing in silent reading (Blythe et al., 2015). As van den Boer, van Bergen and de Jong (2014) conclude, even though findings cannot be generalized as applying exactly the same way in the reading modes, “oral and silent reading indeed are fairly similar reading modes, based on the relations with reading-related cognitive skills” (p. 138). According to these findings, it could be concluded that phonological recoding is associated with both oral and silent reading. In this thesis, special attention is paid to the oral manifestation of phonological recoding. Therefore, the terms *recoding*, *sounding out* and *oral production* in L2 English are considered as referring to the same phenomenon.

2.1.1.2 From L1 to L2: Universal and Language-Specific Features in Reading

After analyzing the role of phonology in reading, it is relevant to delve into how the L1 and the L2 may interact, as L1-L2 variations, in particular at the word level (orthography, phonology and morphology), are likely to have an impact on L2 word reading, especially in terms of speed and precision (Grabe, 2009).

L2 reading is unique in that it is characterized by an active role of both languages. As Koda (2007) puts it, this “dual-language involvement implies continual interactions between the two languages as well as incessant adjustments in accommodating the disparate demands each language imposes” (p. 1). Nevertheless, if the claim that reading entails a conversion of printed graphs into interpretable language forms can be valid for all languages, there must be a certain number of universal features that characterize reading regardless of the language considered (Perfetti, 2003; Perfetti & Dunlap, 2008; Perfetti & Liu, 2005). In turn, if languages are encoded in particular ways through their writing systems, these systems should impose particular constraints on the L2 processing demands and, in turn, cause specific levels of difficulty on the basis of the linguistic properties of the languages.

In a review of research, Grabe (2009) lists a number of cognitive and linguistic abilities that are brought to the process of reading, no matter the language/s concerned. Of note is the fact that readers apply a number of bottom-up and top-down processing skills. Interestingly, the processes include (but are not limited to) the use of working and long-term memory capacity, phonological processing and the instantaneous manipulation and

integration of word level and intra-word level information, some of which were fully explained above. In dealing with universal and language-specific constraints, Koda (2007) proposes two complementary terms that are of interest for this work. Along with other authors (for instance, Perfetti, 2003; Perfetti & Dunlap, 2008), she views reading essentially as a *mapping* enterprise. Therefore, learning to read presupposes a) the understanding that specific language elements are encoded in writing (the general mapping principle), and b) the progressive realization of the ways in which symbols and sounds are to be matched with decoding and encoding experience (mapping details). From this perspective, dual-language involvement and the existence of universal aspects and language-specific constraints lead to an analysis of the mechanism of *transfer*.

Drawing on previous theoretical formulations and empirical evidence obtained from diverse research paradigms, various language pairs and different learning contexts, Koda (2007, 2008a, 2008b, 2009) has proposed a theory of transfer in L2 reading that conflates a number of issues, such as metalinguistic awareness, orthographic distance between the two languages, cross-linguistic variation, and L2 proficiency, with special emphasis on L2 print input and exposure. The main claims of the theory (Koda, 2008a) are as follows: ‘facilitation from shared linguistic awareness competencies’, ‘contribution of first-language metalinguistic sophistication’, ‘language distance effects’, and ‘cross-linguistic variations’ (pp. 88-89).

The first contention refers to the fact that all readers embark on the task of reading applying the same degrees of awareness, which are said to be language-independent and readily available in an L2. The second claim states that this condition, in turn, assists readers in the development of awareness and reading skills in the L2 in such a way that learning to read in a new language requires less effort than learning to read in one’s L1. As to the third claim, the author states that, because of dual-language involvement, the similarities and differences between L1 and L2 affect to some extent the development of L2 reading skills and competencies. Lastly, L2 reading development depends on L1 and L2 properties; consequently, “the emerging competencies...vary systematically across learners with diverse first-language backgrounds” (p. 89). Koda’s model proposes that L2 print input plays a vital role in skills development, as it can modulate distance effects

and cross-linguistic variations. The more the quality and quantity of L2 print input, the more refined L2 reading skills will be (Koda, 2007).

As can be noticed, a major argument of the model is that L1 awareness skills are facilitative of L2 reading development, especially in initial stages. Phonological awareness, in particular, once developed in the L1, is considered to be readily available in the L2. In this regard, it is logical to think that the ability to segment spoken language into its individual phonological components, conceived of “as an enabler in learning mapping principles” (Koda, 2008b, p. 224), can transfer relatively easily. Also, inasmuch as dual language involvement represents a permanent situation, facilitative transfer in phonological awareness is likely to continue even after advanced levels of L2 proficiency have been reached (Grabe, 2009; Koda, 2008a).

This model, as well as others (Cummins, 1991, 2000; Grabe, 2009), is based on the premise that well-acquired L1 competencies can pave the way for the acquisition of L2 abilities. Little is said, however, about transfer as interference. According to Koda (2008b), there is one skill that, once developed in an L1, is apparently of little use in L2 reading: graphophonological awareness. Applying correct L2 grapheme-phoneme connections demands sufficient print and reading experience. Until graphophonological conversion skills become fully-fledged in another language, readers are likely to fall back upon the resources readily available in their native language. In fact, research has shown that cross-language differences in terms of orthography-phonology connections can influence L2 processing and oral production skills not only positively but also negatively (Hamada & Koda, 2008; Leong & Joshi 1994; Sun-Alperin, 2007; Thompson & Brown, 2012). In the next subsection, further explorations are made into orthography and phonology by examining their workings from the perspective of L2 speech development.

2.1.1.3 Orthography in L2 Pronunciation

For several decades now, L2 phonology researchers have studied and attempted to explain the complexity inherent in the acquisition of an additional speech system and the possible interactions between the languages involved. Over the last 60 years, a great number of L2 speech development theories have been put forward (Arabski &

Wojtaszek, 2011; Celce-Murcia et al., 2010; Hansen, 2006; Hansen Edwards & Zampini, 2008; Ioup & Weinberger, 1987). A full description of every possible model is beyond the scope of this thesis. Rather, it is worthwhile to describe briefly the constructs that have been dominant along the history of L2 phonology research. Some such themes include universals, age of acquisition, socio-cultural aspects, and transfer (Hansen Edwards & Zampini, 2008).

Regarding universals, certain models have postulated the existence of specific paths in the development of L2 phonological features (Greenberg, 1978). In terms of age of acquisition, some researchers have proposed the existence of a period in infancy after which the acquisition of native-like L2 skills, particularly in the area of pronunciation, is difficult, if not impossible, to attain (Lenneberg, 1967; Scovel, 1988). Sociocultural aspects have also figured in L2 speech acquisition. Issues such as speech style and variation have been approached from a number of different frameworks (Hansen Edwards, 2008). Transfer has long been considered a major influence in the acquisition of L2 pronunciation. For example, Speech Learning Model (SLM) states, among other claims, that an L2 sound which is similar to an L1 sound will be more difficult to learn than an L2 sound which is completely new (Flege, 1995). Perceptual Assimilation Model for L2 speech learning (PAM-L2) is another transfer theory. Here, its authors (Best & Tyler, 2007) postulate L2 speech learning on the basis of patterns of assimilation of L2 phonetic segments to phonological categories in the L1. Of interest is the fact that “listeners may identify L1 and L2 sounds as functionally equivalent” (Best & Tyler, 2007, p. 26) even in cases in which these segments are clearly divergent in phonetic terms.

While the role of L1 spoken language features (be they phonetic, or phonological, or both) has been investigated profusely throughout the history of L2 speech development (leading to the formulation of a number of models), the mentions of the potential influence of orthography are comparatively scant (see Bassetti, Escudero & Hayes-Harb, 2015). Toward the end of the 20th century, a few studies addressed the issue directly (Young-Scholten, 1998; Young-Scholten, Akita, & Cross, 1999), while others touched upon it tangentially (Altenberg & Vago, 1987; Zampini, 1994). Despite these exceptions, it is notable that orthography-phonology connections have been

comparatively neglected within L2 phonological development theorization, to the extent that there does not exist up to the present any formalization of the effects of spelling on L2 speech (Bassetti, Escudero & Hayes-Harb, 2015; Rafat, 2011; Simon & Van Herreweghe, 2010).

More systematic work, however, began at the beginning of the 21st century. Ever since, a number of variables have come to be considered regularly in the growing body of research. For example, studies have focused on the positive (Erdener & Burnham, 2005; Steele, 2005) and negative (Bassetti, 2007; Browning, 2004; Young-Scholten, 2002) effects orthography can have on L2 pronunciation. Also, a number of situations in the input have been taken into account. Authors have studied the roles of auditory-only, orthographic-only, auditory-orthographic, visual-only, auditory-visual, and auditory-visual-orthographic conditions (Erdener & Burnham, 2005; Rafat, 2011; Young-Scholten, Akita & Cross, 1999; and Zampini, 1994; among others). In addition, studies have been carried out on the basis of the orthographic depth of the participants' L1s and L2s.

Very recently, a study has been published with certain characteristics and findings that are of great interest for the work reported in this thesis. Bassetti and Atkinson (2015) conducted several experiments in which orthographic effects were investigated using different procedures. They focused on the readers' oral rendition of silent letters, the influence of vowel orthographic representation on vowel length, the treatment of the past form marker <-ed>, and the pronunciation of orthographically distinct homophones. The participants were in all cases L1 Italian⁸ learners of L2 English, aged 16-19. In addition, they had received formal instruction in English for quite a number of years. Unlike most research of this type, the words chosen for the tests were all known to the participants. The authors found that orthography affected the students' L2 phonological production in multiple ways.

The findings of this study, combined with others (notably Drummond, 2014; Erdener & Burnham, 2005; Rafat, 2011; and Zampini, 1994) strongly suggest that speakers of

⁸ Italian orthography is similar to Spanish in phonological transparency (Cook & Bassetti, 2005).

orthographically transparent⁹ L1s tend to be affected by L2 orthographies to a large extent, particularly if the orthographies are opaque. Consequently, in the context of this thesis, it is important to analyze the characteristics of the English and Spanish orthographies and how they relate to phonology. This is done below.

2.1.1.4 Cross-Linguistic Comparison: English and Spanish Orthographies at Stake

Even though certain reading processes are said to be common to all or most languages (as was explained above), it is a fundamental question to understand that different languages can be processed in ways that are unique to them. As Koda (1996) summarized two decades ago (and studies have confirmed ever since), “[c]ross-linguistic comparisons of word recognition processes have, in fact, provided empirical evidence suggesting that different writing systems...require qualitatively different processing procedures” (p. 451). In addition, it has also been found that readers may use L1 processes in approaching an L2 writing system (Ziegler & Goswami, 2005).

Learning to read in any language involves primarily the understanding that its writing system is a graphic representation of the spoken forms of that language (Perfetti & Dunlap, 2008). This happens invariably regardless of the type of writing system. In other words, because of the mapping principle (mentioned above), written forms are mapped onto spoken forms. The writing systems of the world’s languages have been classified, on the basis of their mappings, as *alphabetic* (a graph representing a phoneme), *syllabic* (a graph representing a syllable), and *logographic* or *morphosyllabic* (a graph representing a morpheme) (Coulmas, 2003; Perfetti & Dunlap, 2008). English and Spanish are examples of alphabetic languages, Japanese Kana represents a syllabic system and Chinese Mandarin is logographic (Perfetti & Dunlap, 2008).

Regardless of the type of mapping, each of the systems mentioned above is generally known as an *orthographic system* or *orthography* (Frost, 2005). An orthography is “the implementation of a writing system to a specific language” (Perfetti & Dunlap, 2008, p. 17). Thus, the English and Spanish systems, albeit alphabetic in nature, are two different orthographies, each with its own mapping peculiarities. However, despite the mapping differences, novice readers of either language alike must understand, along the journey

⁹ Orthographic transparency and opacity is fully described in 2.1.1.4.

of learning to read, the *alphabetic principle*, that is, the notion “that spelling systematically represents spoken words” (Snow, Burns & Griffin, 1998, p. 4).

One particular aspect of orthographic systems, which can determine the rate of reading acquisition, is *orthographic depth*, that is, the degree to which letters represent sounds. An orthography with a one-to-one grapheme-phoneme correspondence is said to be *transparent* or *shallow*, whereas one in which there is a one-to-many mapping is known as *opaque* or *deep* (Frost, 2005; Frost, Katz & Bentin, 1987; Katz & Frost, 1992). Languages vary in transparency/opacity in a continuum; in other words, orthographies tend to be classified as more or less transparent when they are compared with others. Orthographic depth can be considered from a reading perspective or from a spelling perspective (Grabe, 2009), which means that a letter may represent one and the same sound or different sounds, and a sound may be spelled with one and the same letter or with different letters.

In English, the probability that a letter may represent one and the same sound and one sound may be used in presence of one and the same letter is not guaranteed whatsoever. For example, highly frequent lexical items containing the same vowel letter – such as *cat*, *part*, *walk* and *was* – all represent different vowel sounds. In turn, the back vowel sound /ɔ:/ can be graphically represented by a range of letters and letter strings, for instance, *war*, *stall*, *caught*, *door*, *board*, and *pour*, among others. In Spanish, by contrast, the orthography-phonology issue is much simpler. For example, *-a-* is always pronounced /a/ and /a/ is always spelled with *-a-*. It can thus be seen that English and Spanish are clearly different in this respect. Whereas the former is placed toward the opaque extreme, the latter is placed in the transparent end of the cline. In brief, English bears inconsistency in both directions (Ziegler & Goswami, 2005, 2006), while Spanish shows a fairly high level of bidirectional consistency (Joshi, 2010). As stated above, graphophonological relations in a language are decisive in reading acquisition. One important implication of this fact is that readers of more consistent orthographic systems learn to read faster than do their counterparts in languages with less consistency (Goswami, 2010b; Joshi, 2010; Ziegler & Goswami, 2005).

Another feature that plays a key role in analyzing orthographic-to-phonological mapping is *granularity* or *grain size*. This concept refers to the units in the orthographic and phonological systems that “allow a straightforward and unambiguous mapping between the two domains” (Ziegler & Goswami, 2005, p. 3). For example, there are bigger and smaller grain sizes. A syllable is typically bigger than the onset and the rime, and these, in turn, are usually bigger than the phoneme. In consistent orthographies, letter-sound correspondences are stable at the small grain size: one symbol represents one sound, which means that learning about sounds through letters is relatively simple. In contrast, inconsistent orthographies are less reliable at this level. For this reason, in order to find greater symbol-sound regularity, the reader needs to take in more orthographic information to find larger processing units: the onset-rime chunk, the syllable, or even a whole word. In widening the mapping search, readers of inconsistent orthographic systems have to cope with the fact that there are many more larger units than smaller units. Ziegler and Goswami (2006) explain the plight of the English beginning reader as follows:

in order to decode the most frequent 3000 monosyllabic English words at the level of the rime, a child needs to learn mappings between approximately 600 different orthographic patterns and 400 phonological rimes, far more than would be needed if the child could simply learn how to map 26 letters onto 26 phonemes (p 431).

The range of mapping operations to be performed by L1 English beginning readers looks simply astounding. Given the figures above, it is easy to understand why L1 English beginning readers are at a disadvantage with respect to their Spanish counterparts. To become competent readers, the former have to learn a larger number of units than the latter, who can potentially recognize most words (even unfamiliar) through the application of much simpler one-to-one symbol-to-sound conversion rules. For older L2 English readers, such as the ones participating in the study reported here, the mapping enterprise may be less demanding, in light of their L1 literacy and their fair degree of L2 knowledge. However, as has been stated, English orthography still poses certain challenges, in particular in the identification of unfamiliar words. Therefore, in a context where the L1 orthography is consistent and the L2 orthography is inconsistent, learning a variety of patterns, especially larger grain sizes, can be highly beneficial for identification and reading (Birch, 2007; Cao, Brennan, & Booth, 2015).

To sum up, L2 phonological performance is affected by a number of factors that are interconnected, such as L1 and L2 pronunciation features, L2 development, and orthographic input. In this last issue, and in the wake of the foregoing discussion, it is easy to agree with Bassetti (2008) in the assertion that “L2 orthographic input, reinterpreted according to ... L1 orthography-phonology conversion rules, interacts with ... L2 auditory input, also reinterpreted according to L1 phonology, leading to non-targetlike phonological representations of L2 phonemes, syllables and words” (p. 202). Actually, this is in line with Koda’s (2008b) claim about the little use of grapho-phonological awareness in L1 for the oral processing of L2 written material. It is noteworthy that distinct lines of L2 research seem to converge in the central role of graphophonemic awareness, not only in reading but also in pronunciation. This awareness can be gained through graphophonemic instruction. In the next section, a thorough analysis and review of instructed SLA is presented. Furthermore, a case is made for the explicit teaching of orthography-phonology connections.

2.1.2 Instruction in SLA

Ever since the appearance of the first SLA studies, about half a century ago (Ellis & Shintani, 2014), this field has made considerable headway toward the understanding of the complexity of learning a language other than the L1. Among the wide array of issues examined, several topics have figured prominently in SLA research and have made invaluable contributions to the growth of the field. The themes include learners’ age of and readiness for acquisition, learners’ aptitude and motivation, amount and quality of the input, the possible influences of the L1 on L2 acquisition processes, and types and effects of L2 instruction (Ellis & Shintani, 2014; Han, 2004; Housen & Pierrard, 2005; Piske & Young-Scholten, 2008). The last of these issues is of utmost importance for the study reported here, since it provides the theoretical framework from which pedagogical claims will be made. However, before tackling the issue of instruction proper, it is necessary to make reference to the rationale for its implementation, which, in turn, can shape an instructional program: the type of knowledge to be developed.

2.1.2.1 Knowledge Development in SLA

A dichotomy that has been on the SLA agenda for a number of decades now is that between explicit and implicit knowledge (Ellis, 2009; Ellis & Shintani, 2014), of which a brief résumé is given below. Explicit or declarative knowledge is knowledge about

linguistic forms and norms, which can only be accessed “through controlled processing” (Ellis & Shintani, 2014, p. 13). In contrast, implicit or procedural knowledge represents the internalization of structures and processes which allow individuals to use a language naturally without having to analyze it consciously. Besides, the former is said to be conscious, while the latter is regarded as intuitive and tacit (Ellis, 2009). Even though using an L2 proficiently presupposes *mostly* a large amount of readily available unprocessed implicit knowledge of that language, explicit knowledge has been considered to play an important role in L2 learning. Furthermore, there has been vigorous debate about whether explicit knowledge can actually assist in the development of implicit knowledge.

Certain SLA researchers have approached this matter in terms of the *interface issue*, that is, the possibility of there (not) being a connection between them. For some researchers, notably Krashen (1981), these two types of knowledge are not associated whatsoever, as the processes used to obtain them are separate. Within this position, consequently, there is no chance that explicit knowledge could become implicit in a direct manner (Ellis & Shintani, 2014, p. 12). This has been called the *non-interface* position. From what has been termed the *strong interface* position, the opposite perspective is held (DeKeyser, 2007). There is believed to be a close relationship between these knowledge forms; with the intervention of practice, declarative knowledge can become automatized and a subsequent retention of the facts learned may operate (Ellis & Shintani, 2014). Finally, the *weak interface*, a compromise between the other two, accepts the possibility that explicit knowledge may become implicit, albeit with “some limitation on when or how this can take place” (Ellis, 2009, p. 21). In sum, for upholders of the interface position, it is possible for learners to gain language proficiency through (a certain amount of) processing of linguistic facts.

The interfacing of explicit and implicit knowledge has been explained by several skill formation models in the field of cognitive psychology (Ellis, 1994). One such model is ACT (Adaptive Control of Thought), more recently referred to as ACT-R (R standing for *rational*). Formulated by Anderson and subsequently adapted by this and other authors (Anderson, 1983, 2007; Anderson, Corbett, Koedinger & Pelletier, 1995; and Anderson, Matessa & Lebiere, 1997), the model classifies both types of knowledge as

declarative and procedural. Skill development takes place when declarative knowledge is converted into procedural knowledge. It is important to note that, in this framework, *skill* is a broad term used to represent all kinds of ability, ranging from the most pedestrian, like riding a bicycle, to the most challenging, such as learning an L2.

According to ACT-R, this conversion comes about in three stages. The first one is the *declarative* stage, which involves learners becoming aware of facts, typically in the form of statements or rules. In the second stage, called *associative*, there occurs the proceduralization of the information through the implementation of practice. Here there is still association with declarative knowledge. Thirdly, in the *autonomous* phase, learners are capable of performing in a way which is “automatic, error free, and with little demand on working memory or consciousness” (Ranta & Lyster, 2007, p. 149). As is apparent from this brief description, an aspect that becomes pivotal in ultimate skill mastery is that of practice. In the field of L2 teaching, this term can be understood “as specific activities in the second language, engaged in systematically, deliberately, with the goal of developing knowledge of and skills in the second language” (DeKeyser, 2007, p. 1).

The focus on ACT-R and its three component stages is warranted on the grounds that this empirically-tested model (Anderson, 2007) constitutes a strong theoretical support and is the backbone on which the pedagogical design proposed in this study was built. After analyzing the relevance of explicit and implicit knowledge in SLA and establishing practice as the enabling element, it is necessary to refer to the context in which all these variables can be operationalized: instruction.

2.1.2.2 Instructed SLA

Instructed second language acquisition addresses “the relationship between the kind of learning opportunities provided in a classroom context and the learning outcomes that they are likely to result in” (Ellis, 1997, p. 107). Instruction, which is generally understood as the organizing principle on which most classroom activity is centered, can be defined as “any systematic attempt to enable or facilitate language learning by manipulating the mechanisms of learning and/or the conditions under which these occur” (Housen & Pierrard, 2005, p. 2). Two aspects of this definition are critical to

understanding the importance of instruction: systematicity and manipulation. The former is an indispensable component, since any item or set of items to be taught needs to be dealt with carefully and in an organized way, which generally requires a series of steps or lessons with both general and specific objectives to be met. The latter refers to the strategic modification of one or more aspects of the learning context, such as amount and type of input and task demands, among others, with a view to fulfilling the objectives and, consequently, bringing about the desired learning.

Below is a description of a number of instruction aspects that are regarded as relevant to discuss in the design of lessons addressing English graphophonemic relations. These issues include a) purpose of instruction, b) type of instruction, c) approach to explicit instruction, and d) use of metalinguistic information.

e. The Purpose of Instruction: Communication and/or Form

In order for instruction to be well-targeted, it is essential to determine if the primary purpose is the communication of meaning or the learning of linguistic forms. In the former case, instruction will be *non-interventionist* or *meaning-focused*, whereas in the latter, it will be *interventionist* or *form-focused* (Ellis & Shintani, 2014). In the second orientation a finer distinction can be made departing from Long's (1991) classification. This author proposed a subdivision into *focus on formS* (FonFS) and *focus on form* (FonF). A focus-on-forms approach is one which places emphasis on the presentation of linguistic features followed by instances of practice. As Loewen (2011) explains "[a]n example of FonFS is traditional grammar instruction in which explicit rules about language are taught" (p.577). In contrast, FonF entails the teaching of linguistic elements in the context of meaningful, communicatively oriented tasks.

Over the last decades, meaning-focused, communicatively-oriented approaches have held sway in a large number of L2 contexts (Nassaji & Fotos, 2011; Richards, 2006). For a long time, these approaches eschewed a focus on grammar on the grounds that what needs to be acquired in SLA goes far beyond grammatical competence and involves a host of other aspects highly relevant in communication (Richards, 2006). However, more recently, it has been acknowledged that effective instruction programs should combine communicative language teaching with form-focused instruction so that

high degrees of accuracy can actually be achieved in the target language (Nassaji & Fotos, 2011). This may be due to the fact that certain linguistic features can be more readily acquired through a focus on communication while others are more likely to be internalized if they are targeted more directly (Doughty, 2003; Ellis, 2008, VanPatten, 2002).

As will be demonstrated at several stages in this work, the development of spelling-pronunciation mapping skills can lend itself easily to a form-focused approach. Moreover, in the experimenter's experience, this area of language competence has proved resistant to acquisition through the application of approaches other than the ones that focus on specific features directly and discretely.

f. The Type of Instruction: the Implicit/Explicit Dilemma

Another instruction issue that needs to be attended to is the implicit/explicit differentiation, as it is important to decide which modality can better serve the objectives of a given teaching program. According to Ellis (2009), instruction that is implicit “seeks to provide learners with experience of specific exemplars of a rule or pattern while they are not attempting to learn it”, which produces the internalization of “the underlying rule/pattern without [learners’] attention being explicitly focused on it” (p. 16). In contrast, explicit instruction involves directing attention to language features, which starts with presentation of specific features and is followed up with practice, typically controlled. Given that the emphasis is placed on forms rather than communication, explicit instruction is typically rule-oriented, predetermined, planned and obtrusive (de Graaf & Housen, 2009).

Numerous studies were conducted to determine the effectiveness of one or the other modality. A great number of them were selected for inclusion in two famous comprehensive meta-analyses conducted in the first decade of 21st century: Norris and Ortega (2000), and Spada and Tomita (2010). Briefly, both conclude that explicit instruction can be more effective than implicit instruction in bringing about L2 learning. Confirming the results obtained in the earlier work, the findings in the more recent meta-analysis point to “a more positive role for explicit instruction and, furthermore, suggest that explicit instruction works better than implicit instruction for both simple

and complex [linguistic] features” (Spada and Tomita, 2010, p. 283). It must be noted that the effects of explicit instruction were studied on measures of spontaneous L2 production. According to these authors, this seems to constitute evidence in favor of the strong interface hypothesis, whereby explicit knowledge of a language can become implicit through practice, as was explained above.

g. The Approach to Explicit Instruction: Deductive or Inductive

Presentation, one of the major pillars of explicit instruction, is normally conducted following either a deductive or an inductive approach. Each presupposes reversing the procedure of the other. In short, while deduction involves the explanation of a linguistic form followed by instances of actual use, induction requires that examples be provided first so that explanations can be derived from the instances presented. To date, abundant research has been carried out to gauge which approach is more conducive to student learning. It has been reported that either method can be appropriate depending on the learners’ familiarity with the items in focus (Gower & Walters, 1983, cited in Ellis & Shintani, 2014, p. 84). However, inductive treatments seem to have more advantages and fewer disadvantages than deductive approaches for the purposes of feature acquisition (Ellis & Shintani, 2014).

h. Metalinguistic Information in Instruction: the Value of Rule Presentation

One last issue to be discussed in this section is the pedagogical value of presenting linguistic facts in the form of descriptions. Explicit teaching of L2 features usually goes hand in hand with the presentation of rules that explain the scope of use of these features. Most instructors are often caught up in the dilemma of teaching language features with the least possible theorizing about them. This is no doubt a daunting task. It is obvious that the provision of metalinguistic information does not per se guarantee that learners will eventually learn a feature and use it naturally whenever necessary. Nor will metalanguage replace key issues in SLA such as input, production, practice and feedback. Nevertheless, it is relevant to point out that a number of studies have found positive correlations between metalanguage and L2 proficiency (e.g. Alanen, 1995; Basturkmen, Loewen & Ellis, 2002; DeKeyser, 1995; Hu, 2010; Rosa & Leow, 2004). In other words, metalinguistic knowledge can facilitate L2 learning, thus confirming the body of findings cited above.

So far, this section has discussed major concepts emerged from models of knowledge acquisition and instruction. These notions constitute a vital part of the theoretical backbone of the work described in this thesis. As is explained, multiple studies have confirmed that teaching certain L2 features using explicit inductively-oriented training procedures, including rule presentation and practice activities, can yield important learning gains (See the description of the study in Chapter 3). In the next part of this section, the objective is to describe phonics, as it is the focus of the explicit instruction proposed. This method is argued to be useful in the pronunciation class to help students improve their oral production and phonetic transcription of written words.

2.1.2.3 Phonics Instruction: Connecting Letters and Sounds

A much-studied concept in literacy research, *phonics* typically makes reference either to instruction that teaches letter-sound correspondences as a step toward the mastery of reading aloud or to the knowledge and abilities gained through this teaching (Ehri, 2011; Pennington, 1996). In the former sense, it is also known as *graphophonemics* or *graphophonemic instruction* (Stahl, Duffy-Hester, & Dougherty Stahl, 2006), an alternative term for the latter sense being *graphophonemic awareness* (Connelly, 2002; Ehri & Soffer, 1999; Koda, 2008b). Even though the focus of this thesis is on the first of the two concepts, they are both interlaced, as instruction is expected to bring about awareness (Connelly, 2002). The following paragraphs in this subsection include a) a description of phonics and b) a case for the use of this approach in L2 English.

a. Types of Phonics

There exists a range of approaches to phonics, some with unique characteristics, some with features common to others. Among the most frequent types are *synthetic phonics*, *analytic phonics*, *analogy-based phonics* and *phonics through spelling* (Algozzine, Obiakor, Brooks Nelson, & Bakken, 2009; Ehri, Nunes, Stahl, & Willows, 2002). Synthetic phonics, also known as *word-building*, teaches students to make up words by picking each letter in the word, transforming it into the sound it represents and blending the sounds into a lexical unit (Brady, 2011). In contrast, analytic phonics, or *word-breaking* (Bald, 2007), focuses on complete words and asks students to find individual sounds in them. That is to say, the sounds are analyzed after the word has been

identified. In analogy-based training, readers are taught to use familiar words as a way to read unknown words. Students are made to look at parts of lexical items that share spelling and pronunciation. This approach is more suitable after learners have acquired a good deal of letter-sound mapping, especially because they are in a better position to manipulate syllabic and subsyllabic elements (Ehri, 2006, p. 163). Phonics based on spelling, unlike the other approaches, takes a different point of departure. It starts not with letters but with sounds. This is the reason why this phonics type is said to be geared toward the development of writing rather than reading (McGuinness, 2004).

Even though each form of phonics may be used to develop specific literacy skills, research has demonstrated that a systematic program, combining most or all of the activities just described in a well-sequenced manner can be highly beneficial to the development of reading (Beck & Beck, 2013; Blevins, 1998; Ehri et al., 2002; Lewis & Ellis, 2006; Moats, 1998; Wyse & Goswami, 2008). Another point to be factored in, of particular interest in this work, is the inclusion of *phonic generalizations*. This term refers to the presentation of a number of reading rules, whereby learners match letters to “abstract mental units, phonemes, in order to access words and meanings” (Birch, 2007, p. 93). They have also been labeled as *text-to-speech correspondence rules* (Carney, 1994). Discussions of the usefulness of phonic generalizations in English reading instruction date back over half a century (Bailey, 1967; Clymer, 1963; Emans, 1967). It has been proposed that they be reduced to the smallest number possible for fear that learners might be bogged down in theoretical description at the expense of actual, practice-based reading acquisition (Clymer, 1963).

b. Phonics in L2 English

It goes without saying that, as far as phonological recoding is concerned, L2 English speakers need to make the same orthography-phonology associations as their L1 counterparts. Therefore, it could a priori be said that the methodology that has been found useful for the latter can also bear fruit if applied to the former. In addition, there are a number of other facts which apply solely to an L2 situation. As was explained in the previous section, whereas L1 speakers usually embark on reading after they have acquired the sound system in its entirety and are, consequently, already fluent speakers of their language, a large number of L2 learners have to struggle with both activities

more or less at the same time. In other words, these L2 speakers have to learn to read long before becoming competent *pronouncers* (if they ever do). In addition, as was already discussed, L2 orthographic input, which constitutes the primary or only source of input in a variety of educational contexts, is likely to be “reinterpreted” in terms of L1 letter-sound associations (Basseti, 2008). Therefore, the orthography-phonology connections to be made in L2 reading may “compete” with the ones already available for the L1, usually resulting in faulty pronunciations in early acquisition stages. Added to this problem is a situation typically experienced by teachers but also demonstrated empirically (see Basseti & Atkinson, 2015): after a wrong letter-sound association has been established by students, it is difficult to be ‘undone’. Given this scenario, explicit phonics instruction can constitute a useful pedagogical tool to assist pronunciation learning.

L2 English reading theorists and practitioners strongly support the use of phonics as a feasible methodology (Bauer & Gort, 2012; Birch, 2007; Grabe, 2009; Koda & Zehler, 2008; Lems, Miller, & Soro, 2010). In particular, for the sake of teaching unfamiliar word reading, Birch (2007) proposes that ESL learners employ strategies which are consistent with developmental findings on L1 English reading (Ehri, 2005, 2006, 2011; Ehri & Snowling, 2004). These strategies consist in attending to contextual information in order to decide how specific letters or letter combinations are pronounced. In particular, this author suggests that L2 English learners use reasoning by analogy to frames from which safe mapping can proceed. These frames are word parts generally larger than one or two letters, such as phonograms¹⁰, whole syllables and bound morphemes, all of which show consistent pronunciation across an important number of English words. In simpler terms, this involves learning new words by paying attention to the bit that is analogous in both spelling and pronunciation to known words. For example, readers can be made to derive *rake* from *make* by analyzing the phonogram they have in common. In this study, analogy-based analysis was combined with rule presentation to produce a series of graphophonemic mini-lessons in the pronunciation class at university level in order for students to develop firm letter-sound associations.

¹⁰ This term is commonly used in phonics to refer to “a letter or group of letters used to represent a unit of speech” (Scarborough & Brady, 2002, p. 328).

2.1.2.4 Phonetic Transcription in the University L2 English Pronunciation Class

The purpose of this subsection is to deal with phonetic transcription in theoretical and pedagogical terms. It should be noted here that *phonetic*, as was explained above, is not used in opposition to phonological but as a generic term (Heselwood, 2013; Ladefoged & Johnson, 2010; Odgen, 2009). In addition, a rationale is given for its use as a representational system of speech in the English pronunciation class at university level.

Inasmuch as transcription is a graphic representation of spoken language, it has some similarities with spelling. In fact, both systems use written forms and, in certain languages (notably Western European ones), the systems may use identical and/or similar symbols. However, there are obvious differences between them. Even though similar graphic forms may be used, such as <g, k> as spelling symbols and /g, k/ as phonetic symbols, they have different interpretative values. Orthographic forms have the primary function of showing the lexical elements that are reproduced in printed form, whereas phonetic transcription offers an analysis of speech (Heselwood, 2013). In other words, whereas spelling has an identifying function, transcription has a denoting function. Furthermore, the skills needed to handle one system and the other are different. For using spelling, the only requirement is having the appropriate reading and writing skills, that is to say, being literate. In contrast, for handling phonetic transcription successfully, users of a given language need specialized knowledge of the phonetic and phonological features of that language and the conventions used for the symbolic representation of those features. As stated by Heselwood (2013), phonetic transcription employs “symbols which have phonetic definitions drawn from phonetic theory”, while “spelling uses characters as the written expression of language. The characters themselves have no theoretical definitions” (pp. 13-14).

For speech representation to be consistent, therefore, phonetic transcription must use a set of symbols that function systemically. The most widely used notation system is the *International Phonetic Alphabet* (IPA), which uses roman-based symbols and diacritics to represent a wide range of speech phenomena (Esling, 2010; Heselwood, 2013). There are different types of transcription depending on the degree of detail represented, the orientations (speaker-oriented or listener-oriented), and the methods used, among other classificatory criteria. One distinction often made is that between *phonemic* and

allophonic. They are also known as *broad* and *narrow*, respectively (Cruttenden, 2014). The former is the kind of transcription in which symbols represent the segmental elements which function to make meaning distinctions. The latter is used to describe sounds as they occur in their phonetic contexts, that is, with articulatory and auditory modifications due to the effects exerted by neighboring sounds. In addition, transcription can be done from written words and texts or from dictation.

ESL language teachers and theorists often harbor misgivings about the use of transcription in teaching phonetics and phonology because it is a matter of debate whether such training can actually assist in pronunciation skills development (see, for example, Paikeday, 1993). However, at university level, a solid grounding in transcription is thought useful for a number of reasons. In the first place, notation systems, being theoretically-grounded, are reliable methods of teaching phonetic and phonological aspects of oral language in a written medium. In cases in which students cannot tell which sound has been used, unequivocal reference to it can be made safely through a phonetic symbol. Secondly, in L2 English contexts where the L1 has a transparent orthography, learning a one-to-one representation system may reduce the effects of an apparently chaotic orthographic system (Sönning, 2013). Benefits may, in turn, be gained in terms of awareness-raising (Hancock, 1994; Mompean & Lintunen, 2015), for example, of the existence of distinctions between L2 sounds which have no clear counterparts in the L1, such as English /ɑ:/ and /æ/ if compared with Spanish /a/. A third reason is associated with transcription involving complex cognitive processing (Knight, 2011; Knight & Maguire, 2011). As a specialized skill to be learned after reading and writing have been fully developed (Knight, 2011), transcription constitutes an additional language processing system which learners can use to gain further cognitive development and representational abilities. Finally, it can give students independence from teachers. Part of learning new words involves understanding their phonological properties, such as stress patterns and phonemic identities. Handling a notation system effectively can help students learn new lexical items orally and check pronunciation aspects of known words without instructors having to be involved in the process.

For the reasons discussed above, phonetic transcription is thought of as a useful pedagogical tool to buttress the teaching of the correlation between the English orthographic and the phonological systems. Thus, through this medium, the regularity that certain letter combinations typically encode particular sounds may also be extended to the symbolization. This may, in turn, assist learners in furthering their phonological skills.

2.2 Literature Review

Over the last decades, a significant number of studies have been conducted to test the efficacy of phonics in L2 English. As has already been stated, most of the investigations have focused on its effects on oral reading development, but effects on other skills have also been examined. Furthermore, since learning to read typically occurs during infancy, a great amount of the research has involved child populations. Nevertheless, there have been studies concerned with the use of phonics with adolescents and adults.

2.2.1 Phonics with L2 English Child Learners

A number of studies were conducted with child learners of different L1s and with diverse methodological designs. For example, Denton, Anthony, Parker, and Hasbrouck (2004) studied two different reading instruction programs with a total of 93 L1 Spanish learners of L2 English in grades 2-5. The interventions lasted 10 weeks and took place three days a week for about 40 minutes each day. One of the programs included phonics instruction and decodable text practice, while the other consisted of reading with vocabulary and comprehension work. The students in the former group had significant gains in word identification, though there were no effects for other measures, including reading comprehension.

Later on, Johnson and Tweedie (2010) conducted a literacy study in a number of primary schools in Malaysia. A total of 862 participants, who were Year 1 students of L2 English from rural areas, were divided into control and experimental groups. The experiment involved a six-week treatment, in which the experimental group received direct phonemic awareness instruction. A number of reading activities were conducted as pre- and posttests. Even though both groups improved after the treatment, the experimental one had scores significantly higher than the control in all activities.

In an action research study, Martínez Martínez (2011) examined the effect of explicit, systematic phonics instruction on a number of literacy skills among first-grade students attending a bilingual school in Bogotá, Colombia. Using both quantitative and qualitative methodology, the investigation examined the performance of a total 85 female L2 English learners. They were tested 8 times and, on the basis of the grades obtained in the first test, they were grouped into three performance ranges. The results revealed that the lowest-performing group benefited the most, as it evinced the largest gains in terms of reading comprehension, spelling and verb use.

Chu and Chen (2014) compared the effects of two different phonics approaches on L1 non-alphabetic child learners' L2 English word reading. The participants were assigned to two different groups: *phonics-only* and *phonics+*. The first one received a variety of grapheme-phoneme activities in conjunction with phonological skills practice. The other had the same type of activities but there was also text reading. Both groups showed significant improvement in posttest conditions with no significant inter-group difference. However, the *phonics+* group had significantly better results in the delayed posttest. This is indicative that phonics may be more productive if it is associated with text reading.

Very recently, in a quasi-experimental study of 100 true beginning L1 Iranian learners of L2 English, aged 10-12, Farokhbakht and Nejadansari (2015) examined the effects of synthetic multisensory phonics on literacy skills. There were four experimental groups and four control groups. The treatment proposed was conducted over 30 consecutive sessions and took place in the first 45 minutes of every session. The findings reveal that the children in the experimental groups (synthetic phonics) outperformed the control groups (rote letter-sound associations) on measures of reading and spelling.

As Snow (2008) cogently put it in a summary of research on L2 literacy, “[m]any of the instructional components known to be effective with monolingual English speakers ... appear to be effective as well with English-language learners” (p. 284). In fact, the array of studies surveyed here, each with specific methodological constituents and with diverse population characteristics, reaffirm Snow’s assertion that phonics instruction is effective with L2 English learners.

2.2.2 Phonics with L2 English Teenage and Adult Learners

Studies with these populations tend to be less common. A number of them have addressed pre- or non-readers and individuals with certain deficits in their reading abilities (Jones, 1996; Koda, 1999; Strucker, 2002; Durgunoğlu & Öney, 2002; DelliCarpini, 2006, 2011).

A study undertaken by Nam (2006) is of particular interest, as some of its methodological features are similar to the ones in this thesis. Nam's research investigated the effect of modified phonics (traditional phonics and phonemic awareness) instruction on speech production and perception in English by 23 Korean adult EFL learners. The participants were assigned to two experimental groups on the basis of treatment length: 12 were assigned to a one-month treatment group and the remaining individuals received a six months' instruction. Unlike the study conducted for this thesis, the participants studied either grammar or conversation and were not university-level students of English. They had been studying English for over five years and had never been to an English-speaking country. This condition is similar to that of the students studied in this thesis. The results showed that this type of instruction was effective for speech production and perception and that there was a high correlation between these two measures.

Research with students doing university programs is even more scant. Some of it does not concern the teaching of phonics proper but how teacher trainees view this type of instruction as part of their own training. Chien (2014) published an exploratory study conducted with non-native pre-service English teachers about their thoughts on what should be the basics of pronunciation instruction. Surveys and interviews were administered to 58 intermediate and advanced-level students. Among the top priorities are not only teaching strategies and knowledge of the language but also sound knowledge of phonics and K.K.¹¹ transcription skills.

Only three studies could be traced which measured the effects of ESL phonics on a number of skills. One such study was conducted by Huang, Lin, and Su (2004), which

¹¹ This is a transcription system used to teach language and, particularly, pronunciation in some East Asian countries, such as Taiwan (See Chien, 2014 and Huang at al., 2004, among others). The system was designed by American phoneticians J. S. Kenyon and T. A. Knott, hence the KK initials.

was aimed at examining the possible effects of phonological skills training on vocabulary acquisition. The study involved 272 university freshmen students from Taipei, Taiwan, enrolled in a *Basic English* program, a requisite course taken as part of several university programs of studies, such as Agriculture, Engineering, Management and Humanities and Social Sciences. The students were divided into two groups: experimental and control. Both groups received the same training with a unified syllabus but the experimental one had additional phonological awareness instruction, consisting in a series of letter-sound correspondence exercises, a number of graphophonemic identification activities and the use of K.K. phonetic transcription. This training lasted about one semester and took place during the first ten minutes of every lesson. The researchers used standardized phonics and vocabulary tests. The phonics test consisted in non-word reading (a total of 90 single items were read in isolation). The results showed that the type of activities used as phonological training was beneficial for students' vocabulary development.

Another study was carried out by Khatib and Fat'hi (2011). These researchers conducted an experimental study to test the efficacy of two different approaches to reading comprehension. The participants were 60 L1 Iranian learners of English doing an ESP course. The control group was taught through a program based on translation of passages and question-answer exercises, while the experimental group received training in a number of pronunciation practice activities, including phonics and transcription of words. The results revealed that instruction through the automatization of the phonological component was more effective than the more traditional approach.

The third of these studies was conducted by Iadkert (2014). He investigated the effects of phonics on ESL students' pronunciation. A total of 20 Thai university students majoring in English for International Communication were examined. The participants received a five weeks' synthetic phonics instruction. A pretest and a posttest were administered. The test consisted in reading aloud a 30-word list focusing on ten specific consonant sounds (eight fricatives and two affricates). Posttest scores were significantly higher than those obtained in the pretest. This means that the instruction is considered to have been effective in assisting students to develop letter-sound knowledge and reading and spelling skills.

In conclusion, several studies have focused on the teaching of phonics in ESL contexts. A small number of such studies were focused on university-level training. Notwithstanding the fact that some investigations integrated phonics with phonological awareness and transcription, no research to date has been published addressing the effects of phonics instruction on oral production and transcription of unfamiliar words of L1 Spanish university-level learners of L2 English.

Chapter 3

The Study

After discussing theoretical issues and providing the investigative background for the research conducted, it is essential to spell out all the methodological steps and procedures implemented. Therefore, this chapter presents a detailed report of the context of the study, the objectives and hypothesis, the research design, the materials and the participants. The chapter closes with reference to the methods used for the analysis of the data, which are further explained in Chapter 4.

3.1 Context

As was mentioned in the introduction, the study reported here aimed to investigate the effect of explicit instruction on the pronunciation skills of a number of students of English at Facultad de Lenguas (FL), Universidad Nacional de Córdoba (UNC). FL offers undergraduate programs in several European languages. The academic programs include English Teacher Training, English-Spanish and Spanish-English Translation and Research on English Language and Culture¹². It is worth mentioning here the fact that FL students not only learn the target language but also learn *about* it. The research was conducted with participants enrolled in English Pronunciation Practice (EPP), a first-year course. In this course, lessons are taught weekly in two 80-minute periods throughout the two terms of the academic year, totaling about 96 hours of pronunciation instruction. The students are expected to reach intermediate-level proficiency, which in the *Common European Framework of Reference for Language Learning and Teaching*, CEFR for short (Council of Europe, 2001) is equivalent to Level B1, within the band described as *Independent User*.

As one of the initial, common-core courses in the English programs mentioned above, EPP assumes little or no knowledge of technical or theoretical aspects of English phonetics and phonology. It constitutes, in fact, an introduction to this area of linguistics, focusing mainly on practice and providing the theoretical essentials for students to acquire and improve English pronunciation skills. The accent described and used by most instructors is the British standard accent, variously known as *Received*

¹² The names provided here summarize the professional scope of these programs and do not constitute whatsoever a translation into English of their official names or the degrees conferred upon completion.

Pronunciation (RP), *Modern Received Pronunciation* (MRP), *Standard Southern British English* (SSBE), *BBC English* (Ashby, 2011; Cruttenden, 2014; Jones, Roach, Setter, & Esling, 2011; Wells, 2008). Following the course specific objectives, students are expected to attain the following: produce naturally and fluently English segments in reading and retelling activities, use weak and strong forms of pronunciation efficiently and appropriately, realize the rhythmical structuring of English as a result of the proper application of weak and strong forms, assign *prominence*¹³ appropriately to achieve informative cohesion and text coherence, acquire speaking abilities to facilitate the fluent and effective use of English in a range of content areas¹⁴, use phonemic and allophonic transcription with dexterity and precision.

Graphophonemic instruction of the type proposed in this work is typically not imparted in this course. Over the years, it has seemed an unspoken assumption that, with the type and amount of training received in this course, the students can automatically pick up English grapheme-phoneme relations, with this training incidentally impacting the learners' pronunciation knowledge. The performance of a large number of EPP takers throughout the years, both in oral and written activities, seems to disprove this assumption and is probably an indirect indication that letter-sound connections should be made apparent through systematic instruction.

3.2 Objectives and Hypothesis

The present investigation was spurred by the desire to inquire whether explicit graphophonemic instruction may have any effects on university-level students' pronunciation skills. In order to answer this query, certain objectives were formulated to guide the research process.

3.2.1 Objectives

The objectives of the study are classified into general and specific.

General Objective

¹³ *Prominence* here refers to the concept developed by Brazil (1997).

¹⁴ These areas correspond mainly to the topics studied in *English Language I* and *English Grammar Practice*, another two common-core, first-year courses.

This study aims to investigate whether explicit phonics instruction contributes positively to the oral production and phonemic transcription of unfamiliar words of a number of university-level L1 Spanish learners of L2 English.

Specific Objectives

The specific objectives to be fulfilled in this study are the following:

- 1) To determine whether there exist significant differences in the oral production of unfamiliar words by the experimental group before and after phonics instruction;
- 2) To determine whether there exist significant differences in the phonemic transcription of unfamiliar words by the experimental group before and after phonics instruction;
- 3) To determine whether there exist significant differences in the oral production of unfamiliar words by the control group between two specific times, which are simultaneous with those at which the experimental group will be tested.
- 4) To determine whether there exist significant differences in the phonemic transcription of unfamiliar words by the control group between two specific times, which are simultaneous with those at which the experimental group will be tested.

3.2.2 Directional Hypothesis

It is predicted that students who receive explicit phonics instruction have better results in terms of oral production and phonemic transcription of unfamiliar words containing the orthographic combinations chosen for this study than do students who did not receive such instruction.

3.3 Research Design

After the definition of the context, the objectives and the directional hypothesis, it is necessary to present the aspects that were considered in the design of the research. First, reference is made to the research type. Next, the variables being investigated are identified and defined and, third, issues concerning research validity are discussed.

3.3.1 Quasi-Experimental Research

On the basis of the educational context in which the research was conducted, it was deemed appropriate to use a quasi-experimental design. According to Neuman (2007),

quasi-experiments “help researchers to test for causal relationships in a variety of situations where the classical design is difficult or inappropriate. They are called *quasi* because they are variations of the classical experimental design”. (p. 208). One such variation is related to the “random assignment of whole groups rather than individuals to treatments” (Lodico, Spaulding, & Voegtle, 2010, p. 261), which is one of the typical features of experimental research. In other words, intact classes were examined. This step was taken because it was necessary to ensure that the participants’ attendance routines¹⁵ at FL would not be significantly disrupted by the experiment. Among the features that are shared by experimental and quasi-experimental research are “the frequent presence of control groups and pretest measures, to support a counterfactual inference about what would have happened in the absence of treatment” (Shadish, Cook & Campbell, 2002, p. 14). Both factors were included in this research. The other characteristics of the design used in this study will be described in the remaining of this chapter.

3.3.2 Variables

In (quasi-)experimental treatments, as was said earlier, researchers are interested in causal relationships. First, they think of effects that are possible to be brought about and then they mull over the likely causes. In these types of research variables are typically classified as *independent* and *dependent*. The former is the “one that identifies forces or conditions that act on something else”, whereas the latter is usually referred to as the variable which is “the result or outcome of another variable” (Neuman, 2007, p. 91). In this particular research, the independent variable is phonics instruction of specific letter combinations and their representing phonemes and the dependent variables are the students’ oral production and phonemic transcription of the combinations included in the treatment.

3.3.3 Research Validity

In research design and implementation, investigators are concerned with validity because they need to make cause-effect conclusions on solid grounds (Lodico et al., 2010). Two types of validity are often analyzed in quasi-experimental research: internal and external. They are addressed in turn in the remaining of this subsection.

¹⁵ Both the testing instances and the instruction phase were conducted during the regular class periods of each of the participating groups. See further in 3.4 and 3.5 below.

Internal validity refers to the degree to which the results of the research are attributable to the independent variable (in this case the phonics treatment) and not due to any “extraneous or unaccounted for variables” (Edmonds & Kennedy, 2016, p. 7). There exist a number of extraneous variables that may invalidate a quasi-experimental design of the type presented here. On the basis of the characteristics of this study, it was necessary to consider the following potential threats: *history*, *maturation*, *testing*, *instrumentation*, *differential selection of subjects*, and *mortality*¹⁶. These variables are addressed in turn below.

- a. *History* refers to the events that may take place during the time in which treatment and posttesting are carried out. In the case of this research, the control used was a relatively short time span between pretest and posttest (around one month). This factor is more likely to operate in prolonged longitudinal studies. Its incidence in this case is highly likely to have been null.
- b. *Maturation* includes certain physical, mental or emotional aspects that may have an effect over time. Some of them can be “growing older, hungrier, wiser, stronger, or more experienced” (Shadish et al., 2002, p. 57). The effects of this factor are believed to have been minimized by the inclusion of a comparable control group and also by the short length of the treatment. In this respect, it is known that developments in linguistic knowledge normally take a longer time to proceduralize and automatize.
- c. *Testing* is related to the influence that administering a test may have on the results of a later test. This may have been a serious source of invalidity, given precisely the short time elapsed between tests. After all, the students may have remembered the mechanics and the purpose of the test. To avoid any of these pitfalls, certain precautions were taken. The tests contained exercises similar to the ones students do in regular lessons. Also, the true objectives of the tests were not disclosed and distracters were used (see 3.4.2).
- d. *Instrumentation* changes may occur if instruments are different or undergo revisions. Both pretest and posttest, while not identical, were comparable. That is, they contained the same instructions, the same number of features and involved

¹⁶ This selection was drawn from the following sources: Ary, Cheser Jacobs, Sorensen and Razavieh (2010); Lodico et al. (2010); and Shadish et al. (2002).

- comparable challenges in terms of word unfamiliarity. In addition, the taking of samples occurred under the same conditions in both testing instances for both groups.
- e. *Differential selection of subjects* refers to the possibility that the groups may not be equivalent. As was stated earlier, participant randomization was not possible. However, important measures were taken to compensate for this. First, the groups were similar in some respects, such as amount of L2 instruction, and overall proficiency level (see more at 3.5.1). Second, demographic information was also gathered to discard the presence of outlying participants that may bias the results obtained, for example by having studied English for a larger number of years than expected or by having lived abroad for some time (see Appendix B.3 and B.4). Despite these measures, this extraneous variable could not be controlled for completely.
 - f. *Mortality* points to participant attrition, or the possibility that subjects may drop out. Given the characteristics of the students and the context of the study, it was considered a fact that there would be attrition. Therefore, a large number of students were selected so that with the foreseen mortality the definitive numbers might still be valid in terms of the statistical analysis employed and the validity of the research.

According to Lodico et al. (2010), “[e]xternal validity is the degree to which the results are generalizable beyond the sample used for the study” (p. 241). This power for generalizability may be jeopardized by a number of factors, such as *selection-treatment interaction*, *specificity of variables*, *subject effects*, and *experimenter effects*, among others. These variables are explained below¹⁷.

- a. *Selection-treatment interaction* is concerned with the possibility that the subjects in a study may not represent the population to which generalizations are intended to apply. In order to counteract this possible effect, a detailed description of the subjects was included to avoid overgeneralizing to all types of students regardless of context.
- b. *Specificity of variables* refers to the fact that the specific characteristics of the setting, the time of testing, the variables selected and the instruments used for testing may all affect the generalizability of the study. As stated by Lodico et al. (2010), “[t]he more specific the conditions are, the more limited the generalizability

¹⁷ This selection has been done using the sources listed in footnote 5.

of the study” (p. 251). With a consideration of the foregoing, exhaustive information has been included to allow the possibility of replication of the research.

- c. *Subject effects* occur when certain attitudes and feelings of the participants interfere with the study somehow limiting generalizability. For some participants, knowing that they are part of a research study may alter the way they process tests. Even though all participants were informed that they would be participating in an investigative study, crucial information such as objectives and research characteristics was withheld. In addition, the tasks students had to do were similar to other tasks they do in EPP.
- d. *Experimenter effects* refer to the possibility that the researcher may influence consciously or unconsciously the students’ performance. The solution found to this threat was preparing scripted lessons to be delivered in the same fashion by other teachers than the experimenter (see 3.5.2 and Appendix A).

3.4 Materials

In line with the methodological design adopted and in order to fulfill the objectives listed above, the materials used in this study include a) a pretest administered to both experimental and control groups immediately before the instruction, b) an instruction set used with the experimental group, and c) a posttest administered to both experimental and control groups immediately after the instruction¹⁸. Before the implementation of these methodological steps, decisions had to be made concerning the choice of orthographic combinations and other operational issues. These decisions are explained below. In addition, all the tasks included in the testing sessions and the activities in the instruction phase, which were designed by the experimenter, are fully described in the remainder of this chapter.

3.4.1 Selection of Orthographic Units and Test Piloting

Given the characteristics of EPP (in terms of students’ proficiency level, time allocation and workload) and the objectives of the present study, it was imperative to pinpoint the scope of graphophonemic instruction. It is true, as has already been stated, that L1 English readers need to learn a much greater number of spelling-to-sound correspondences than do L1 Spanish readers. However, it is also the case that literate L2

¹⁸ Each of these items has been included in the appendix.

learners of English approach the reading process with a considerable amount of graphophonemic awareness and other linguistic skills already gained in their L1. In addition, taking into account the orthography-pronunciation relations in each language and the role of transfer, it was necessary to select orthographic combinations that may cause difficulty among the learners. For well over a year before the study, a record was kept of the combinations that posed a challenge in terms of both oral production and transcription. Based on recurrent mispronunciations and mistranscriptions by students, eight orthographic combinations were finally shortlisted for inclusion in the study, namely, <irC> (as in *bird*), <urC> (as in *gurgle*), <arC>, (as in *tartan*) <tu> (as in *perceptual*), <sion> (as in *collision*), <ous>, (as in *courageous*), <ign> (as in *benign*), and silent <t> (as in *thistle* and *glisten*).

These combinations were used in the construction of a written and an oral task complying with the objectives set forth for the study (see above). Once they were designed by the experimenter and reviewed by an experienced pronunciation instructor, a pilot test was conducted with ten EPP students with characteristics similar to the ones who participated in the study. Among the issues to be assessed were the length of each task, the time allotted, and the logistics of taking written and oral samples. As a result of the piloting, a number of adjustments were made to secure that testing would be completed successfully during a regular class period. The most important change was the reduction of the combinations to a total of six. In keeping with this criterion, the spelling patterns randomly selected were <irC>, <urC>, <tu>, <sion>, <ous>, and silent <t>.

3.4.2 Pretest and Posttest

As was explained above, a pretest and a posttest were conducted. Each of them was made up of two parts: an oral activity and a written activity. The former was aimed at eliciting the participants' pronunciation of unfamiliar words containing the set of orthographic combinations under study, whereas the latter centered on the participants' phonemic transcription of unfamiliar words with the same orthographic combinations. The words were chosen through an Internet wordsearch using the combinations listed

above. A great number of lexical items were collected using a low-frequency criterion¹⁹. Next, in order to ensure that the words were highly likely to be unfamiliar to the participants, the reading materials used by FL first-year students were examined in order to prevent words appearing in them from being selected for this study.

3.4.2.1 Oral Task

Specially designed for this study, the oral activity consisted in a reading task in which the participants had to read 11 two-line sentences with a total count of about 200 words. Scattered in these sentences were 21 words containing the 6 orthographic combinations finally selected for the study. Unlike other word reading and pronunciation studies, in which lexical items were presented in lists, or were accompanied or replaced by audiovisual stimuli such as recordings and pictures²⁰, the words under analysis were seamlessly integrated into the sentences without any particular stimulus or typographical cuing, such as underlining, boldface, and font modification. There were two main reasons for this decision.

One reason is associated with the need for the test to reflect reading with some kind of context because this is the way in which a great amount of reading occurs both in academic and non-academic settings. In fact, reading practice activities in EPP (and also other courses) involve mostly reading whole passages and utterances in two-speaker conversations rather than pronouncing single words. Nevertheless, sentence reading may arguably constitute insufficient contextualization and be regarded as an artificial task. In this respect, it is important to note that reading sentences usually involves other linguistic processes that may not be present in single word reading (Morris, 2006). Among such processes may be a range of phonetic, phonological, lexical, and morphosyntactic phenomena (Brazil, 1997; Morris, 2006; Scott, 2004; Roach, 2009). Clearly, these phenomena are operational in passage reading as well. Therefore, it was expected that sentence contextualization would distract the participants' attention away from the items at stake. This, in turn, was thought to pave the way for the elicitation of

¹⁹ This criterion consists in checking that selected words be marked as infrequent by the *Macmillan English Dictionary for Advanced Learners* (<http://www.macmillandictionary.com/>). In this dictionary, low-frequency words appear in black type and without any stars. In contrast, higher-frequency words appear in red type and with up to three stars.

²⁰ A great number of studies have used these designs. Some of them include Droop and Verhoven (2003), Erdener and Burnham (2005), Iadkert (2014), Kissling (2013), and Stuart (1999), to name only a few.

pronunciations that could be the result of the participants' graphophonemic awareness (or lack thereof) and not the effect of any extraneous variables.

The other reason is concerned with the issue of practicability. Given the time investment involved in taking the samples, the participants' availability and the logistical constraints imposed on the research, it was essential to design testing instruments containing tasks that could be familiar to the students, instructionally manageable, time-effective, feasible and methodologically reliable.

3.4.2.2 Written Task

As was described above, the development of transcription skills is one of the objectives of EPP. Therefore, it was also considered useful to study the possible effects of graphophonemic instruction on this specialized ability. With this purpose in mind, it was necessary to test the students' transcription of 21 words with the same orthographic configurations as the ones chosen in the oral activity. But, given the essential differences between reading and transcribing, certain precautions had to be taken.

First, transcribing a number of sentences equivalent to the ones included in the oral activity would have been cumbersome, as it would have taken the test-takers several times longer than simply reading the sentences. Therefore, it was critical to reduce the students' work to secure a reasonable test length for the successful completion of the task. Next, it was considered optimal to test them on the same number of words as in the oral activity. But instructing them to transcribe only those words would have created the undesired condition of leading them to focus exclusively on these lexical items. For this reason, the risk had to be counterbalanced. Two solutions were found. One consisted in phrasing the directions strategically so that the focus was placed on phenomena that were not of interest for the study, such as plural noun and regular past tense markers, and weak and strong forms of pronunciation. The other was underlining a larger number of items, including the ones whose transcriptions would be scrutinized. For this reason, the total number of words selected for transcription practically doubled the ones to be actually examined. These two procedures are thought to have acted as effective distracters.

3.4.3 Instruction Set

The students in the experimental group received a three-week graphophonemic instruction. In each of the 80-minute periods involved, students engaged in oral and written graphophonemic practice for a span of 35 to 45 minutes. There were a total of six mini-lessons, one for each orthographic combination. Each mini-lesson began with a five-minute period set aside for homework correction and revision of the contents of the previous lesson. In general, this was followed by a text (either authentic or adapted) to be read first and to be used for analysis of spellings and pronunciations later. The exercises included in each lesson served the purpose of gradually guiding students toward focusing on the combinations under study. Afterwards, a particular grapheme-phoneme correspondence rule was elicited in the students' own words. Next, the rule, with the simplest possible phrasing, was presented for them to analyze and write in their notebooks. Finally, all the words studied were repeated orally and transcribed phonemically. All mini-lessons ended with a short homework assignment to be corrected the following lesson. These assignments consisted in reviewing the previously taught orthographic combination, and reading and transcribing of a set of words containing those combinations. This organization, thus, reflects the procedures suggested in the ACT-R model of skill acquisition explained in 2.1.2.1.

The directions given and the format used were altered slightly in lessons 4 and 6. In the former, the prompt was not a text but sentences containing the items to be focused on. In the latter, the text was replaced by a wordsearch game in which students had to find a number of words with the orthographic combination to be analyzed. Additionally, lessons 1 and 6 had an extra fifteen minutes each. In the first one, reference was made to the general characteristics of English spelling and some historical sources of its orthographic depth. The last one included a revision of the graphophonemic information studied up to that moment. The graphophonemic instruction proposed lasted a total of approximately 4.5 hours²¹.

²¹ This figure results from adding up the estimated average length of each lesson and the extra half-hour beginning and closing the instruction phase.

3.5 Participants

3.5.1 Students

As was explained above, there was no random assignment of individuals to the groups studied. Rather, intact classes were selected to participate in the research (Lodico et al., 2010; Perry, 2005). At the research planning stage, a number of issues concerning student characteristics had to be assessed. Over the last decade, EPP has been taught in eight sections distributed as follows: six in the morning and two in the evening. The experimenter's personal experience of teaching at both times of the day for almost a decade has led him to conclude that there are certain differences between the morning and the evening sections. For example, it has been found that there tend to be more full-time FL students in the morning than in the evening, with an important number of students in the latter time holding jobs. With this background, there is good reason to believe that after several hours' work, the levels of motivation and performance of these students may diminish in comparison with their morning full-time counterparts. Another significant factor is dropout. It is normally the case that the number of students dropping out of one, some or all of their courses is higher in the evening than in the morning, especially in first year. These are the main reasons why the participating individuals both in the control and experimental groups were all students attending the morning sections.

Of the 6 morning sections, 4 were restructured into 2 groups: Group A (the experimental group, made up of the original sections E and F) and Group B (the control group, made up of the original sections A and C)²². It is important to point out that signed written consent was required from each student giving permission for the experimenter to use the data elicited. Such consent was for both tasks but it appeared on the sheets for the written pretest and posttest (see Appendix B.3 and B.4). At the outset of the study, the number of participants was expected to be higher than it turned out. During 2013, the year in which the study was conducted, the enrolment numbers in those sections were as follows: 79 in section A, 78 in section C, 77 in section E, and 74 in section F. As is usual in research of this type, there was expected to be participant

²² According to the current institutional organization of EPP in terms of staff resources, there are four instructors, each of whom is responsible for 2 sections. Sections A and C are taught by the Chair of EPP, while sections E and F are taught by the experimenter. In addition, there are 3 lab instructors (*profesoras asistentes*) appointed to all 8 sections, who are normally responsible for most of the practice activities.

attrition, as the whole study involved three steps along the span of one month. While the pretests were administered to a total of 130 students (Group A=65 and Group B=65), the posttests could be administered to a smaller number, a total of 90 students (Group A=47 and Group B=43). In the meantime, the instruction phase was conducted with Group A.

Once all the instances were finished, it was necessary to make sure that each student had participated in all the stages. The data collected from students who failed to complete any of the necessary phases were discarded. Besides, as the instructional treatment was carried out in 6 consecutive lessons, it was regarded as indispensable that each Group A student be present in at least 60% of the treatment in order for their data to be included in the study. For that reason, an attendance record was kept to eventually discard the samples of the students who participated in less than four lessons. Finally, certain socio-demographic information was elicited about the learners' prior experience with English, in general, and EPP, in particular (see written pre- and posttests in Appendix B.3 and B.4). Eventually, it was decided to cast aside the samples of any students who claimed to have any of the following characteristics: 1) having taken EPP previously, 2) having lived and/or studied in an English-speaking country, and 3) having studied English for more than 4 years before taking EPP²³. After gathering all the data and selecting the samples on the basis of the preceding criteria, the definitive sample size amounted to 62 subjects: 33 in Group A and 29 in Group B.

3.5.2 Instructors

All the mini-lessons given within the instruction phase were taught by the three teachers who were the EPP lab instructors at the time when the study was conducted. They kindly accepted to collaborate in the graphophonemic training and were given precise directions as to how to proceed in each lesson from beginning to end (see Appendix A). Most of each mini-lesson was scripted for them to improvise or divert from the

²³ A decision was made to set 4 years of study as a cutoff point beyond which participants would not be included in the study. This figure resulted from dividing the number of guided learning hours considered necessary for B1 level by an estimate of the possible number of hours of formal instruction a learner is expected to complete in one academic year of private English tuition. According to the *Association of Language Testers in Europe* (See Introductory Guide to CEFR available at <http://www.englishprofile.org/images/pdf/GuideToCEFR.pdf>), the total number of hours to reach B1 is between 350 and 400. In addition, three experienced English teachers and heads of private institutes were consulted about the possible number of hours to be done by a learner at a private institute in one year. A sum total of 100 was the average reached. Therefore, the calculation is as follows: $400 \div 100 = 4$.

objectives as little as possible and to comply with the time allotted for each mini-lesson within the given limits.

3.5.3 Experimenter/Rater

After all the data had been collected, the experimenter proceeded with its organization. The samples were sorted in terms of groups (GA and GB) and tests (pretest and posttest). Each student was assigned a code to keep anonymity. The total number of tokens analyzed was 5208, broken down as follows: GA 2772 realizations (1386 for the written task and 1386 for the oral task, in both cases considering pretest and posttest) and GB 2436 (1218 for the written task and 1218 for the oral task, in both cases considering pretest and posttest).

As for the written task, the 21 words to be studied were examined and the transcription for each was assessed as correct or incorrect. This procedure was carried out for each student and test. All the information obtained was in turn tabulated in spreadsheet format. Next, the same steps were followed for the classification of the oral samples. Each student's reading was analyzed auditorily and the pronunciation of the words under analysis was scrutinized until it was safe to consider the tokens as correct or incorrect. It is important to note that for both tasks, the students' performance was considered regarding the pronunciation and transcription *solely* of the orthographic combinations. Any other word parts were not relevant for this research²⁴.

3.5.4 External Oral Production Rater

In order to check the reliability of the auditory analysis carried out by the experimenter, a teacher not involved with any of the phases of the experiment was invited to collaborate. The teacher, who has wide experience in phonetics and phonology training, was asked to listen to a total of 20 oral samples produced by 10 students (5 from each group) at both pretest and posttest. The samples were chosen randomly. The external rater was instructed to proceed with the analysis of the oral material provided in the same fashion as the experimenter had done with all the oral samples. The words to be analyzed had to be listened to carefully as many times as necessary until a decision was made as to whether the correct pronunciations had been produced or not. The rater was

²⁴ This is in line with grading criterion B used in Takeda (2002, p. 23).

asked to load onto a spreadsheet the percentage of correct pronunciations for each combination. Finally, the results obtained by the external rater were statistically compared to those obtained by the experimenter. This was done by means of Cohen's Kappa, a measure of interrater reliability, calculated using *InfoStat* (Di Rienzo et al., 2016), a statistics software package.

3.6 Data Analysis: Pretest-Posttest Comparisons

Once the data were gathered and organized according to the criteria and procedures explained above, they were also subjected to analysis using *InfoStat*. On the basis of the characteristics of the samples, the objectives set forth at the outset of the investigation and the design of the study, it was necessary to compare the pretest and posttest performances of every student for each combination and in each task. Specifically, a dependent *t* test (also known as *paired t test*) was conducted to assess the difference between the averages obtained in the pretest and posttest conditions. This means that each student was paired with him- or herself on both pretests and posttests. Thus, it was possible to determine if there was a significant difference between the responses considering the two testing times. These observations produced within-group comparisons. In addition, because it was considered important to know if the treatment had a relatively uniform impact (or not) on the individuals who received it, a measure of variability was also calculated.

Some quasiexperimental studies with pretest and posttest conditions (see, for example, Huang et al., 2004; Khatib & Fat'hi, 2011; Waasaf, 2008) usually include between-groups comparisons, which are obviously aimed at detecting any possible differences between the groups at pretest and/or posttest. In the present study, this would have involved comparing the performances of the experimental and the control groups by means of an independent *t* test (also known as *unpaired t test*). It was decided not to conduct this test on account of the fact that such comparative analysis would be of little value given the objectives of this study. Rather than investigating into the degree of comparability of the groups, it was essential to determine how much each group member learnt in connection with the orthographic combinations examined. This could only be established with the methodology employed, i.e., a dependent *t* test.²⁵

²⁵ All statistical analyses referred to in 3.5.4 and 3.6 are described in detail in Chapter 4.

Chapter 4

Results and Discussion

The preceding chapter described the study in terms of objectives, hypothesis, pedagogical context, design, materials and participants. This chapter presents the results obtained from the quantitative analysis conducted and offers an interpretation of the findings. The analysis is organized in terms of two broad types: descriptive and inferential. The descriptive analysis contains two subsections: means analysis and variability analysis. As to the inferential analysis, there are also two subsections: interrater reliability measured for some oral samples and the pretest-posttest comparisons for both groups (GA and GB) and tasks. At the end of the chapter, the findings are interpreted in the light of the information obtained.

4.1 Descriptive Analysis

The descriptive measures analyzed in this section reveal valuable information in at least two ways. The mean values cast light on how much learning took place between pretest and posttest and the variability values show how difficult it was for the students to learn to process the orthographic combinations. Therefore, both measures reveal important information which illuminates the phenomena under analysis.

4.1.1 Means Analysis

As a first step, it was necessary to obtain the mean (i.e. average of correct responses, expressed in percentages), the standard error (an index calculated to measure the variability of the mean) and the 95% confidence interval (a range of values, marked off by the lower limit and the upper limit, within which one can be certain that a mean is included). This procedure was repeated for each one of the orthographic combinations in both GA (experimental group) and GB (control group), considering the oral and the written tasks before and after the treatment. For example, for the oral production of the combination <ous> in the pretest, GB's mean was calculated at 39.97%, with a standard error (SE) of 6.26 and a 95% confidence interval (CI) ranging from 27.15% (lower limit, LL) to 52.78% (upper limit, UL)²⁶. It is important to note that, even though confidence intervals are typically used in inferential statistics (see, for example,

²⁶ To see all the information available for the means analysis, refer to the complete charts in Appendix C.1.

Mitchell & Jolley, 2010), the inclusion of the CI at this stage of the analysis of the findings is warranted due to the need to validate the value of the mean as a descriptive measure.

The results obtained for GA are shown in Figures 1 and 2 below. As can be seen in Figure 1, a comparison of the means obtained at both pretest and posttest reveals that this group made gains in terms of oral production across the board. In other words, improvement was seen for all the orthographic combinations (ORTHs). In addition, these gains were considerably large, ranging between 20.46% (for <urC>) and 53.61% (for <ous>).

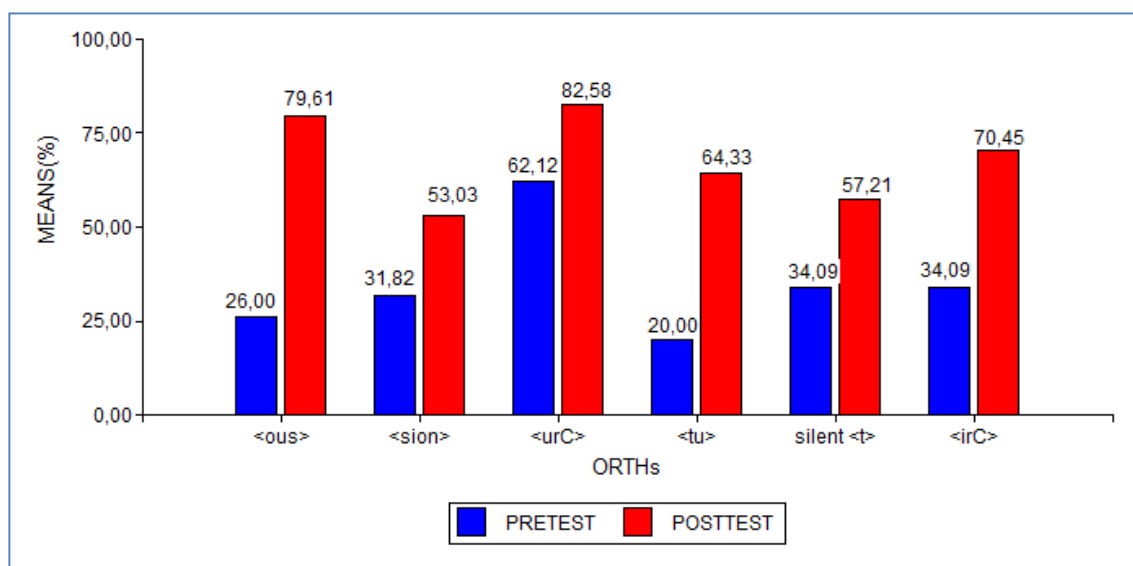


Figure 1: GA oral task pre- and posttest means

Along similar lines, Figure 2 also reveals a significant increase by GA in terms of correct transcriptions of ORTHs across the board. The comparison of the results obtained from the two testing times shows that the gains are similarly large in the written activity, with a range from 25.00% to 50.70%. In both tasks, the percentages were practically doubled at posttest for some of the ORTHs, which means that the performance of this group was twice as good as the pretest measures.

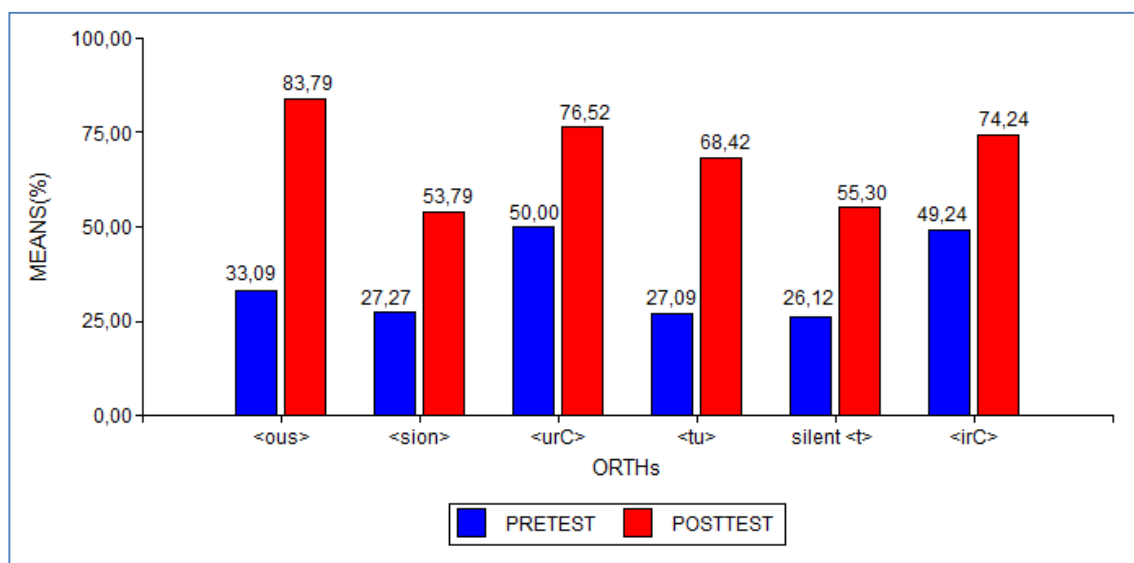


Figure 2: GA written task pre- and posttest means

Regarding GB, the same procedure was applied. The two figures below present the results of this group in both activities. Figure 3 shows GB's performance in the oral task. A comparison between this group's pretest and posttest reveals a decrease in the overall performance of four out of the six ORTHs. Except for <irC> and <tu>, which registered slight gains of 4.32% and 4.55%, respectively, the pronunciation of the other items showed a decrease in the performance of these students. While for three ORTHs, the losses were moderate, in the region of 4.5%, the oral production of *silent <t>* was noticeably lower, as it dropped a considerable 15.97%.

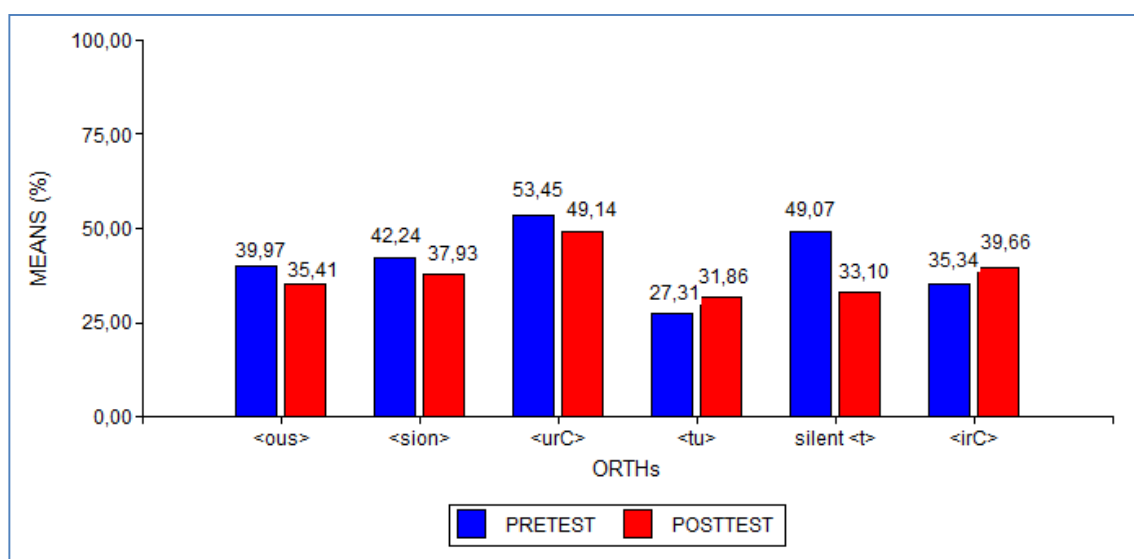


Figure 3: GB oral task pre- and posttest means

GB's transcription results, overall, can be described as slightly better than the ones obtained in the oral task. Figure 4 displays all the values. Of all six ORTHs, there were gains for three of them and there were losses for the other three. As for the gains, <ous> and <sion> were similar, at 6.89% and 6.04%, respectively. The increase registered for <urC> was more than twice as large as the ones just mentioned, at 14.65%. In terms of losses, for <tu> and <irC> they were moderate, at 3.44% and 6.03%, respectively. As far as *silent <t>* is concerned, the decrease in correct responses was 10.28%.

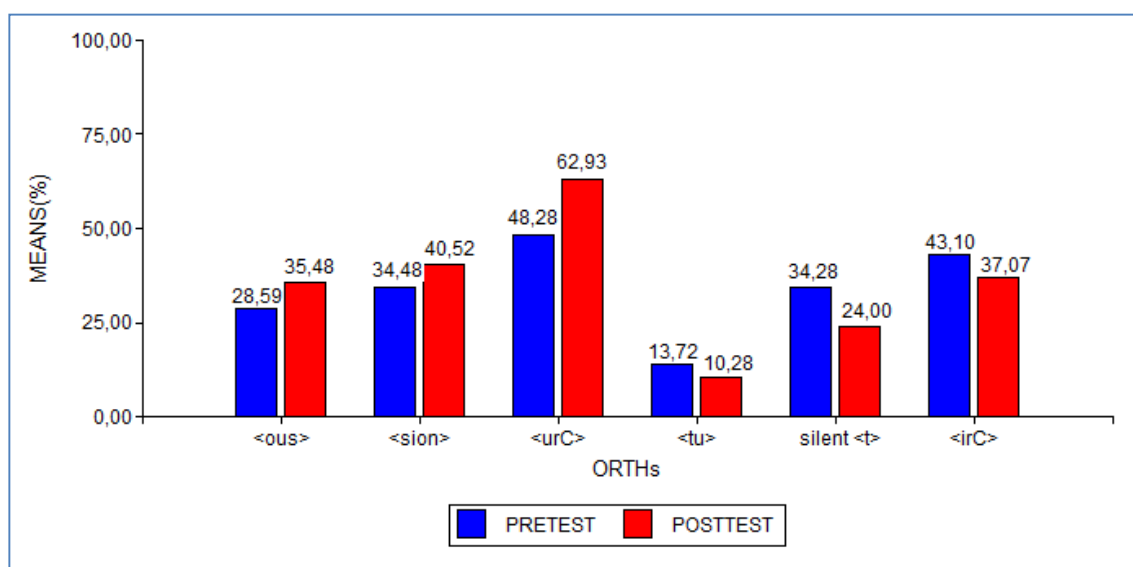


Figure 4: GB written task pre- and posttest means

As was stated at the beginning of this section, the pretest-posttest comparisons of the means for each group are of great import, since they enable an initial approximation to the data set. Thus, with a presentation of the percentages and the differences found, it can *prima facie* be observed that after the treatment, GA outperformed GB in both tasks. In addition, the results reveal that the gains obtained by the former group were larger not only in numbers but also in amount. In other words, GA had more gains than GB and these gains were, in all cases, larger than GB's. Besides, while there were gains and losses in GB, there were only gains in GA.

4.1.2 Variability Analysis

After the means were computed, it was considered relevant to assess variability. Variability is a powerful indicator of how widely spread out a score is in a distribution with respect to the central tendency, in this case, the mean. The importance of

calculating this measure lies in the fact that it can reveal the extent to which a treatment may work for some students but not for others (Lodico et al., 2010). In other words, the amount of variability can determine the efficacy, or lack thereof, of one or more instructional tasks. In the context of this study, variability can reveal the degree of difficulty caused by the different ORTHs to the participating students.

One of the widely used measures of variability is the standard deviation (SD). According to McKay (2006), the SD “is more or less an average of the distance of all the answers from the mean” (p. 44). The SD represents a measure of absolute variation. However, it tends to rise if the average does so, as the former is dependent on the latter. Therefore, in order to find the relative size of the SD, it is necessary to divide it by the mean. This is the Coefficient of Variation (CV), which can be defined as “the ratio of the standard deviation to the mean” (Takona, 2002, p. 401). As stated by this author, the CV is potentially “helpful in comparing the relative variation in several data sets that have different means and different standard deviations” (Takona, 2002, p. 401).

When observing the CV values calculated for the two groups, regardless of the means obtained by each of them, it is possible to see that, in the oral task, GA and GB had different levels of variability in each ORTH. In the pretest condition, the CV for the former group ranged between 47.32 and 130.05, whereas the latter had CV levels between 49.57 and 97.25. In the posttest, there were notable changes. The figures showing variability for GA were reduced considerably for all ORTHs, ranging between 22.05 and 51.07. As for GB, except for <tu> (which reduced its CV considerably) and <urC> (whose variability fell only slightly), the CV rose consistently. Tables 5 and 6 show all the figures.

ORTHs	ORAL PRETEST			ORAL POSTTEST		
	Means	SD	CV	Means	SD	CV
<ous>	26.00	24.41	93.90	79.61	28.95	36.36
<sion>	31.82	22.77	71.56	53.03	27.07	51.04
<urC>	62.12	29.40	47.32	82.58	18.21	22.05
<tu>	20.00	26.01	130.05	64.33	31.19	48.49
silent <t>	34.09	32.65	95.78	57.21	29.22	51.07
<irC>	34.09	28.52	83.65	70.45	28.27	40.12

Table 1: GA oral task pre- and posttest variability

ORTH	ORAL PRETEST			ORAL POSTTEST		
	Means (%)	SD	CV	Means	SD	CV
<ous>	39.97	33.70	84.32	35.41	34.35	96.99
<sion>	42.24	29.20	69.13	37.93	28.05	73.94
<urC>	53.45	26.49	49.57	49.14	23.61	48.04
<tu>	27.31	26.56	97.25	31.86	20.65	64.81
silent <t>	49.07	30.30	61.76	33.10	35.48	107.18
<irC>	35.34	24.57	69.50	39.66	29.52	74.44

Table 2: GB oral task pre- and posttest variability

When eyeballing the results for the written task²⁷, an overall similar picture emerges for GA. With the exception of <sion>, this group had lower levels of variability in transcriptions at posttest than at pretest. The situation changed slightly for GB. For half of the ORTHs (<sion>, <urC> and <irC>), the CV values diminished, which means that there existed less variability after the time elapsed between the tests. However, it is important to point out that, despite this diminution, the variability levels were still high at posttest, especially when compared with those obtained by GA.

In order to supplement the variability analysis, some of the data were arranged in tables with the purpose of showing the number of changes experienced by the students between pretest and posttest. These tables display the numbers of students who coincided in the percentages of responses at both times. Along the main diagonal are the numbers of students who had the same percentages of correct responses at pretest and posttest. These students can be considered “neutral”, as their responses underwent no changes between the testing occasions. The cells above the main diagonal contain the number of students whose responses improved. By contrast, the cells placed below the diagonal represent the numbers of students whose performance worsened. In order to illustrate this analysis, two tables are presented below, which exhibit the oral production of *silent <t>* by GA and GB. In each table, the main diagonal is indicated by boldfaced numbers, representing (as stated earlier) the numbers of students whose pretest and posttest responses did not vary, and below- and above-diagonal cells appear colored.

²⁷ The tables with the values obtained by GA and GB for this task have been included in Appendix C.2.1.

GA					
POS PRE \	0	33	66	100	Total PRE
0	2	6	3	1	12
33	0	4	5	2	11
66	0	2	3	2	7
100	0	0	1	2	3
Total POS	2	12	12	7	33

Table 3: Oral production of *silent <t>* by GA

GB					
POS PRE \	0	33	66	100	Total PRE
0	3	1	0	0	4
33	7	2	2	0	11
66	3	3	3	1	10
100	0	0	2	2	4
Total POS	13	6	7	3	29

Table 4: Oral production of *silent <t>* by GB

As can be seen in Table 3, of the 33 students in GA, 11 students performed identically at both testing times, 19 students performed better (light-blue shaded area) and only 3 got worse (yellow shaded area). As well as collectively, the cells can be interpreted individually. For example, the cell containing number 5 in the light-blue shaded area indicates that there were 5 students who made 66% correct responses at posttest, while they had had 33% correct responses at pretest. The same analysis can be carried out for GB. Table 4 shows that of the 29 students whose performances were evaluated, 10 students showed no pretest-posttest variation, as many as 4 improved their pronunciation at posttest and 15 pronounced this ORTH better at pretest than at posttest. When compared, these tables reveal that there were a larger number of students in GA (19 students) that had positive outcomes at posttest than in GB (4 students). In contrast, GB (15 students) outnumbered GA (3 students) when negatives outcomes are analyzed, constituting a virtual reversal of the figures. Although the distribution of students in terms of learning outcomes presented in the tables above reflects only the case of *silent <t>* in the oral task, the pattern of more posttest correct responses in GA than in GB is repeated almost entirely across tasks and ORTHs (see all the tables in Appendix C.2.2).

4.2 Inferential Analysis

The next analytical step was to test whether the results obtained from the descriptive analysis of the samples were in some way applicable to the population to which those samples belong. In order to do this, it is necessary to use inferential statistics. Relying on probability sampling principles, inferential statistics allows researchers “to test hypotheses formally, [make] inferences from a sample to a population, and test whether descriptive results are likely to be due to random factors or to a real relationship” (Neuman, 2007, p. 269).

An important term associated with hypothesis testing is *statistical significance*. This notion refers to the probability that the results observed may not be due to chance alone. The way to express this likelihood is through a level of statistical significance. This probability level, also known as the *alpha* (α) level or *p-value*, is typically set at 0.05 for second language research (Larson-Hall, 2012). This means that “there is only a 5% probability that the research findings are due to chance, rather than to an actual relationship between or among variables” (Mackey & Gass, 2005, p. 265). In other words, there are 95% chances that the results are not due to chance and reflect the population accurately. Statistically significant results are expressed as $p < 0.05$. The importance of statistical significance resides in that it “suggests that the results are reliable and replicable” (Mitchell & Jolley, 2010, p. 346).

In this thesis, inferential statistics were used for two different purposes. First, it was considered essential that a certain number of oral productions be chosen so that the evaluations obtained by the experimenter/rater could be compared with those by an additional rater and the level of significance of the comparisons may be determined. Next, it was essential to study if the differences obtained by each group in each task after the period in which the treatment was imparted were significant or not so as to decide on the effectiveness (or lack of it) of the phonics treatment. These two analyses are presented in turn below.

4.2.1 Interrater Reliability

According to McKay (2006), in order “to determine inter-rater reliability two researchers examine the same data using the same categorization system to see to what extent they arrive at similar conclusions” (p. 12). As was described in the previous chapter, certain participants from both groups were chosen randomly and their oral productions were given to an external rater so that he could evaluate their performance following the same steps as the experimenter/rater. In order to analyze the data obtained, the Cohen’s Kappa interrater reliability measure was used. This statistic measures the degree of agreement between observers. It is a reliable measure because not only does it consider percentages but it also “takes chance agreement into account” (Révész, 2012, p. 217). The results are placed on a scale of 0-1, in which a value closer to 0 indicates poor agreement and one closer to 1 reveals almost perfect agreement. If

the value is < 0 , it means that there is less than chance agreement. To state that ratings agree to a large extent, it is desirable that values fall between .80 and 1.00. The following figure, which has been adapted from Viera and Garrett (2005), shows the interpretations of the value ranges.

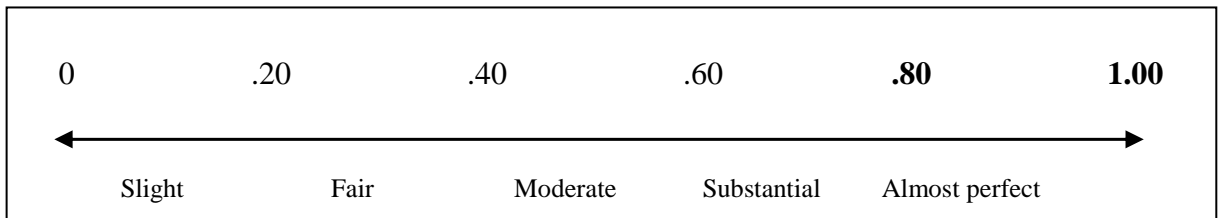


Figure 5: Cohen’s Kappa value interpretations

With the data obtained from both raters, four tables were created for GA and GB ratings at both pretest and posttest²⁸ in which agreements were placed along the main diagonal and disagreements were put below or above, depending on the percentages in each case. Next, the number of agreements and disagreements were computed, the differences and their p-values were calculated and, finally, Cohen’s Kappa coefficient values were obtained. All the data are shown in the following table.

TEST	Agreements % (N)	Disagreements % (N)	Difference	p-value	Cohen’s Kappa
GA					
PRETEST	90.00 (27)	10.00 (3)	80.00	0.0001	0.88
POSTTEST	90.00 (27)	10.00 (3)	80.00	0.0001	0.85
GB					
PRETEST	93.33 (28)	6.67 (2)	86.67	0.0001	0.92
POSTTEST	93.33 (28)	6.67 (2)	86.67	0.0001	0.92

Table 5: Cohen’s Kappa interrater values for GA and GB at pretest and posttest

As can be seen, there was almost perfect agreement between both raters in all four comparisons: GA pretest $\kappa = .88$, GA posttest $\kappa = .85$, GB pretest $\kappa = .92$, and GB posttest $\kappa = .92$, and the differences between agreements and disagreements were between 80.00 and 86.67, all with a significance level of $p < 0.0001$. This means that

²⁸ These tables are displayed in Appendix C.3.

the auditory evaluations conducted for all the samples by the experimenter/rater were highly reliable.

4.2.2 Pretest-Posttest Comparisons

As was informed in the previous chapter, the statistical test employed was the dependent *t* test. This test was conducted for every ORTH considering the four conditions examined: GA oral and written tasks, and GB oral and written tasks. To illustrate the analysis, the data obtained for <ous> in the oral task are presented in Table 6.

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	<i>t</i>	p-value
GA	33	26.00	79.61	-53.61	31.10	-64.63	-42.58	-9.90	<0.0001
GB	29	39.97	35.41	4.55	27.63	-5.96	15.06	0.89	0.3826

Table 6: Inferential statistics for the oral production of <ous> by both GA and GB

In each case, indispensable information was considered, such as the sample size, represented by the number of students, and the means at both pretest and posttest. In addition, it was necessary to compute the difference between the means in terms of correct responses. This difference represents the magnitude of observed change (if it did occur). In the example presented in Table 6, the magnitudes for GA and GB are ostensibly different. In general, a negative difference means that the number of responses was greater at posttest than at pretest, whereas a positive difference means that performance was comparatively lower at posttest. Also, the SD and the 95% CI were computed for the mean difference. If the LL and UL take different signs (- and +), this means that the difference may include 0 and, that being the case, there is not a real difference between the means. Consequently, the difference is not significant, as was the case with GB. If, on the other hand, the LL and UL take the same sign, the difference is statistically significant, as is observed in the results obtained by GA. Finally, the *t* statistic and the p-value were calculated. As can be seen from this table, the p-value for GA was < 0.0001, indicating statistical significance, and the p-value for GB was < 0.3826, showing that the pretest-posttest difference did not reach statistical significance²⁹.

²⁹ The remaining tables, displaying the results for all ORTHs sorted by task type and group, are presented in Appendix C.4.

The following table summarizes the inferential statistics obtained for GA and GB regarding the oral task.

ORTH	GA				GB			
	Mean diff.	LL (95%)	UL (95%)	p-value	Mean diff.	LL (95%)	UL (95%)	p-value
<ous>	-53.61	-64.63	-42.58	<0.0001	4.55	-5.96	15.06	0.3826
<sion>	-21.21	-32.54	-9.89	0.0006	4.31	-4.52	13.14	0.3259
<urC>	-20.45	-28.88	-12.03	0.0001	4.31	-6.19	14.81	0.4075
<tu>	-44.33	-55.62	-33.04	<0.0001	-4.55	-14.46	5.36	0.3548
silent <t>	-23.12	-34.34	-11.90	0.0002	15.97	4.99	26.94	0.0059
<irC>	-36.36	-47.68	-25.04	<0.0001	-4.31	-13.84	5.22	0.3623

Table 7: Summary of inferential statistics for the oral task by GA & GB

Table 7 reveals that for all ORTHs, the pretest-posttest differences for GA are statistically significant, meaning that this group made important learning gains (p between < 0.0001 and < 0.0006). In contrast, the same comparison with GB shows no statistical significance with 5 ORTHs and the group's performance of *silent <t>* being statistically significant at p < 0.0059, meaning that the production of this combination worsened significantly at posttest.

The following table summarizes the inferential statistics obtained for GA and GB in terms of the written task.

ORTH	GA				GB			
	Mean diff.	LL (95%)	UL (95%)	p-value	Mean diff.	LL (95%)	UL (95%)	p-value
<ous>	-50.70	-66.34	-35.06	<0.0001	-6.90	-22.16	8.37	0.3626
<sion>	-26.52	-38.23	-14.80	<0.0001	-6.03	-11.52	-0.55	0.0322
<urC>	-26.52	-36.90	-16.13	<0.0001	-14.66	-24.00	-5.31	0.0033
<tu>	-41.33	-53.85	-28.81	<0.0001	3.45	-7.90	14.79	0.5385
silent <t>	-29.18	-41.61	-16.75	<0.0001	10.28	-1.01	21.56	0.0726
<irC>	-25.00	-37.34	-12.66	0.0002	6.03	-5.79	17.86	0.3049

Table 8: Summary of inferential statistics for the written task by GA & GB

As can be seen in Table 8, GA's performance was similar to that of the oral task across ORTHs. In other words, all the combinations showed statistically significant differences at posttest, reporting noteworthy gains in every one of the cases (p between < 0.0001 and < 0.0002). For GB, the situation is slightly different, as there were both gains and

losses. The values obtained at posttest for <ous>, <tu> and <irC> (gain for the first item and loss for the other two) were not statistically significant ($p < 0.3626$, < 0.5385 , and < 0.3049 , respectively). As for <urC>, there was a significant increase at posttest ($p < 0.0033$). For the other two ORTHs, two different phenomena seem to have taken place. In the case of <sion>, while significance was found, the difference was less significant than the others ($p < 0.0322$). For *silent <t>*, by contrast, while the value was found non-significant ($p < 0.0726$), it was close to the statistical significance threshold ($p < 0.05$).

The two previous subsections present the descriptive and inferential analyses of the results obtained before and after the phonics instruction imparted to GA. In the next subsection, some interpretations are given in terms of the effects and utility of the treatment.

4.3 Discussion

The underlying rationale for the research described in this thesis was one aimed at measuring the reading aloud and transcription abilities exhibited by experimental and control learners after a series of phonics lessons given to the former (see 3.4 and 3.5 above). It was expected that experimental learners would be able to outperform control learners by virtue of the effect of the treatment implemented. In other words, it was expected that experimental learners would benefit from explicit graphophonemic instruction and, consequently, have a better oral and written performance than controls.

Each of the four objectives set forth at the outset of the planning stage, which were in general accord with the hypothesis referred to in the preceding paragraph, was focused on one task and one group. The first two centered upon the experimentals (instruction), and the other two, upon the controls (no instruction). In keeping with this organization, the discussion is presented on the basis of presence (objectives 1 and 2) and absence (objectives 3 and 4) of phonics treatment.

4.3.1 GA and the Presence of Explicit Phonics

At this point, it is important to recall the objectives that were set forth for the analysis of the performances of this group. Objective 1 was aimed at determining whether there

existed significant differences in the oral production of unfamiliar words by the experimental group before and after phonics instruction. Similarly, Objective 2 was aimed at determining whether there existed significant differences in the phonemic transcription of unfamiliar words by the experimental group before and after phonics instruction.

In response to these objectives, it is possible to assert that there existed statistically significant differences in the oral production and phonemic transcription of unfamiliar words by the experimental group before and after phonics instruction. In addition, these differences, which reflect an important amount of learning, may be attributed to the effects of that instruction. Not only were all ORTH means for both activities larger at posttest than at pretest, but the differences in all cases attained statistical significance. An interesting point that is revealed by the variability analysis is the fact that, with the sole exception of <*sion*> in the written task, the CV values dropped for all ORTHs across tasks. In some cases, the decline was very remarkable, twice or almost three times as low at posttest (refer to Appendix C.2). The overall reduction in CV values at posttest is indicative of greater similarity among GA members, as is shown by their responses in the post-instruction instances. Put differently, the treatment can be said to have had a homogenizing effect on GA. In short, phonics instruction produced important learning outcomes in GA and the benefits were enjoyed by most of the learners.

For all these reasons, phonics instruction seems to have been a powerful technique in creating the graphophonemic awareness necessary for GA students to predict the pronunciation and transcription of unfamiliar words. These findings are congruent with the results from most of the studies reviewed above (for example, Huang et al., 2004; Iadkert, 2014; Khatib & Fat'hi, 2011; and Nam, 2006). The success was apparent despite the unintended challenge posed by some items whose morphological makeup was more complex at posttest than at pretest (see further at 4.3.2).

4.3.2 GB and the Absence of Explicit Phonics

In line with subsection 4.3.1, the objectives involving this group are re-presented here. Objective 3 sought to determine whether there existed significant differences in the oral

production of unfamiliar words by the control group between two specific times, which were simultaneous with those at which the experimental group was tested. Objective 4 sought to determine whether there existed significant differences in the phonemic transcription of unfamiliar words by the control group between two specific times, which were simultaneous with those at which the experimental group was tested. These objectives are discussed separately, as there were certain developments worthy of interpretation for each of them.

Regarding objective 3, it can be stated that, for the overwhelming majority of ORTHs, there did not exist statistically significant differences in the oral production of unfamiliar words by GB before and after GA's phonics instruction. Besides, the CV values do not show signs of any kind of posttest improvement either, with the clear exception of <tu>. However, this relative progress is cancelled out by the fact that the learning gains for this ORTH were not statistically significant and, therefore, they could be interpreted as the kind of 'reasonable' development that would be expected of general pronunciation instruction.

As was indicated in the results section, an exception to the non-significance tendency found for GB in the oral task was *silent* <t>. For this particular item, statistical significance was given by the fact that its pronunciation by most of GB's members worsened to a great extent at posttest. In trying to interpret this unexpected negative learning outcome, it is possible to hypothesize that the steep fall may have been caused by the complexity in the morphological makeup of the words chosen for the posttest. More specifically, the words used at this testing instance (*moistened*, *hustling*, and *rustler*) were all complex words (containing suffixes), whereas two out of the three items presented at pretest (*christened*, *gristle*, and *thistle*) were only root words.

As inconsequential as the presence of suffixes might appear, it is essential to note that, as far as visual word recognition is concerned, certain morphological aspects of lexical items are necessary for identification processes to operate (Grabe, 2009, p. 27). In accordance with this remark, Carlisle (2004) states that "comprehending and using complex word forms requires integrated processing of phonology, semantics, syntax, and, of course, morphology" (p. 319). In addition, in learning contexts similar to the one

described here, both inflectional and derivational morphology may create acquisition difficulties to (adult) L2 learners (see Silva & Clahsen, 2008, p. 256). What is posited here is that the presence of more complex words at posttest may have obscured the presence of the spelling combination in question and may, consequently, have undermined GB's ability to recognize items containing *silent <t>*, which a number of students in this group did show at pretest.

It is remarkable that, despite the existence of the same prompts, both GA and GB differed greatly in their oral renditions of this ORTH. At this stage, it seems reasonable to consider Seidenberg's (1992) assertion:

phonological recoding facilitates the recognition of longer, morphologically complex words. Such words may be recognized in terms of subunits that are recovered from left to right (in languages such as English). Phonological recoding may facilitate the retention of parts of words while attention shifts to subsequent parts. It has often been suggested that word-level phonology is relevant to the use of working memory in sentence parsing...; here I am suggesting that it may be relevant to the parsing of words as well (pp. 112-113).

Thus, while GA may probably have benefited from graphophonemic knowledge and used it to identify subword parts successfully, GB is claimed to have failed at this precisely because of lack of graphophonemic training. Nevertheless, the hypothesis that the performances of the two groups as regards *silent <t>* are inextricably linked to the presence and absence of grapho-morpho-phonological knowledge requires further investigation.

As for objective 4, it can be concluded that, for the majority of ORTHs, there did not exist statistically significant differences in the transcription of unfamiliar words by controls before and after the treatment received by GA. Three combinations are worth analyzing, as the students' performance with them was somewhat unexpected. In the first place, in connection with *<urC>*, the statistical significance between the pretest-posttest differences indicates that there existed an important amount of learning with this combination in the written task. In addition, the reduction of the CV level seems to reinforce the fact that these students learned to transcribe this combination without any specific instruction. Actually, it can be said that this ORTH constitutes a special case in the pool of combinations chosen, as both groups' relatively good performance in both

tasks may be indicative of some general sensitivity to the oral production and phonemic transcription of this combination. However, it should also be pointed out that in comparison with GA's significance levels for all ORTHs, the *p-value* for GB's <urC> was less significant than GA's (< 0.0033 vs < 0.0001, respectively). In other words, greater gains in GA may still be attributed to the incidence of phonics instruction.

With respect to <tion>, the statistical significance tendency was also ascertained and confirmed by lower CV values at posttest. Nevertheless, unlike <urC>, the gains were much less significant, closer to the 0.05 level, which constitutes the cutoff point established. Again, despite GB's positive learning outcomes with this ORTH, they were less important than those obtained by GA. Finally, *silent <t>* figures must be interpreted as well. The 0.0726 value and the CV levels obtained point toward non-significance (above the 0.05 level). However, as can be seen from the figures above, GB's performance was worse at posttest. A situation similar to the oral task seems to have operated. At posttest there was a complex word (*chasten*) and two simple words (*bristle* and *trestle*), whereas at posttest two items were complex (*hastened* and *bustling*) and one was simple (*pestle*).

This mismatch may have caused GB to lower their performance, which was not as significant as the group's worsening in terms of *silent <t>* in the oral task, but was still meaningful. A theoretical difference can be addressed here between *significance* and *meaningfulness*. The results of an experiment should ideally be described as statistically significant, meaning that they can generalize to the larger population. However, findings may be above the alpha level and, therefore, non-significant, but still demonstrate that something is happening that should be observed. In such cases, the results can be considered to have *practical significance* or *meaningfulness* because they may be revealing a particular trend (Mackey & Gass, 2005; Porte, 2002). In the case reported here, GB's lower performance with *silent <t>* at posttest in both activities may be an indication of some degree of difficulty in both recoding and transcribing silent letters. This being the case, it is logical to think that learners of an L2 with an opaque orthography whose L1 is transparent (as is the case with the students in this experiment) have a laborious task trying to pronounce successfully words in which some letters do not have their corresponding sounds. In fact, as was explained in 2.1.1.3, this may be

such a strong tendency that mispronunciations may occur even among experienced speakers while reading familiar words (see Bassetti & Atkinson, 2015).

Chapter 5

Conclusion

This closing chapter contains four sections. In the first one, a brief review of the research is presented and the findings are summarized. Next, pedagogical implications and practical applications are addressed. After that, reference is made to the limitations of the study and, lastly, suggestions for future research and final considerations are made.

5.1 Review of the Research and Summary of the Findings

The study reported in this thesis was motivated by two ideas. First, the fact that a number of university L2 English students' recurrently fail to recognize certain orthographic patterns as representing systematic phonological options may be an indication that a basic area of linguistic knowledge is in need of special attention among these students. Second, this researcher holds a strong conviction that explicit instruction is a useful tool in L2 teaching in general and can make a substantial contribution to student learning, in particular, in terms of the linguistic features that are at the intersection of the orthographic and phonological systems of L2 English. Taking these two ideas into consideration, the investigation was conducted to achieve a general objective: to investigate whether explicit phonics instruction contributes positively to the oral production and phonemic transcription of unfamiliar words of a number of university-level L1 Spanish learners of L2 English. In order to test the efficacy of phonics instruction, the participants were divided into two groups: experimental (GA) and control (GB), the former receiving phonics instruction and the latter not being exposed to it.

As theoretical and methodological support for the investigation, two constructs were brought into focus that were essential for the implementation of the instructional course of action proposed: grounds for and type of instruction; in other words, it was necessary to state the *why* and the *how* of phonics teaching. As to the first, grapheme-phoneme relations in L2 English represent a complex phenomenon because, in general terms, L2 speakers have to deal with both L1's and L2's orthographic and phonological systems. Therefore, until they become fully-fledged users of these systems, the enormous

amounts of linguistic and cognitive processing prevent speakers from easy orthography-to-phonology mapping. In order to approach this complexity, it was considered imperative to delve into concepts, lines of enquiry and research findings conducted from the perspectives of L2 reading and pronunciation. In terms of type of instruction, it was crucial to explore the panoply of options available for the teaching of specific L2 linguistic features and the ways these options can impact the learning process positively. Therefore, it was considered crucial to turn to the underpinnings of knowledge acquisition and skill development theories to construct and lend support to a series of pedagogical actions aimed at bringing about the acquisition and use of graphophonemic knowledge in L2 English reading aloud and transcription tasks. In both constructs, the contributions made by cognitive models were pivotal in making methodological decisions.

Once the theoretical stance was adopted, methodological steps were followed, and the data were elicited, the researcher embarked upon the analysis and interpretation of the information obtained. Following is a succinct summary of the findings. It seemed that, as a consequence of phonics instruction, GA was able to produce correct pronunciations and phonemic transcriptions of unfamiliar words to a very significant degree. In other words, the treatment appears to have brought about the effects expected. In contrast, GB failed to evince significant positive learning outcomes in the oral production of the combinations studied throughout the time elapsed during the experiment. Regarding phonemic transcription, even though GB's performance was objectively better than that of the oral task in general terms, for most ORTHs there was not a significant difference between pretest and posttest. Thus, the directional hypothesis presented at the outset of the study can be confirmed: students who received explicit phonics instruction had better results in terms of oral production and phonemic transcription of unfamiliar words containing the orthographic combinations chosen than did students who did not receive such instruction.

It seems interesting to note that, for GB, the slight betterment in the results of the written activity as compared to the performance in the oral task is in line with two tendencies often noticed in *English Pronunciation Practice* (EPP). First, it is common for some students who cannot pronounce words correctly to transcribe the same lexical

items successfully. Second, even in short periods of time (as the one elapsed between pretest and posttest in this study), improvement is more palpable in transcription tasks than in oral rendition. This may indicate that for these students the actual pronunciation of sounds is probably more effortful than their written representation and, hence, they may need more time to develop oral skills than to acquire transcription abilities.

In connection with this interpretation, it is relevant to point out that some of the inherent differences between spoken and written language (in this case, *transcribed* language) may have been at play here. The physical form of speech makes it ‘ephemeral’ (McMenamin, 2002, p. 28), which means that it is transient and, therefore, ‘elusive’ (see Levis & Sonsaat, 2016, p. 110). Producing L2 sounds (largely associated with the capacity to perceive them) is known to be a laborious task, as it normally involves the formation of new articulatory habits. Besides, there may be a great deal of interspeaker variation as regards the actual realization of the phonemic inventory, which makes learning sounds even more complicated. Transcription, in contrast, inasmuch as it represents unequivocal reference to speech, seems to be easier to learn, as the symbols are stable and fixed, regardless of individual differences. In addition, a word can easily and successfully be transcribed by putting together the symbols representing the sounds. This is not the case with a spoken word, which generally cannot be pronounced by mere accumulation of sounds, as other prosodic and physical phenomena are involved.

On the basis of the overall results obtained in this study, it is believed that the phonics instruction given to GA has made a really valuable contribution toward homogenizing the performance of the experimental group as a whole and leveling out oral and transcription output. Despite the relatively little time during which the intervention took place (around one hour weekly for approximately a month’s length), the statistical evidence gathered seems to support the interfacing between explicit and implicit knowledge. The successful accomplishment of the reading and transcription tasks by this group of learners may be indicative of the proceduralization and automatization of explicit knowledge, which was thus used effectively (see Anderson, 1983, 2007; and Anderson, Matessa & Lebiere, 1997, among others). In other words, through the decisive role of practice, the experimental learners seem to have gone through the stages of skill formation as proposed in ACT-R: declarative, associative, and autonomous (see

2.1.2.1 above). Anecdotal evidence may be used here to illustrate this point. At least, three GA students were recorded (while doing the reading tasks at posttest) to make explicit reference to the possible pronunciations of unfamiliar words on the basis of analogy with other words they already knew or had studied as part of the treatment.

5.2 Pedagogical Implications and Practical Applications

There can be said to be a dialectical relationship between L2 instructional practices and L2 research. On the one hand, difficulties arising in the classroom may point to the existence of gray areas which may need to be illuminated by well-thought-out, purposeful investigation. On the other hand, L2 research may spawn the tools that may be required to enhance both teaching and learning. Therefore, it can be stated that practice and research should ideally go hand in hand if the ultimate goal is to produce student learning. Departing from these reflections, this section deals with pedagogical implications and proposes concrete applications of phonics in the pronunciation class at university level.

The findings of this study suggest that it may be opportune to address the relationship between orthography and phonology both systematically and explicitly. Confirming the results obtained from related research and debunking the presumption that, after a few years' instruction, the pronunciation of orthographic combinations can be 'picked up' without attention and overt teaching, this research has proved that significant learning of problematic letter-sound mappings can occur if such features are addressed directly through easy-to-process theory and focused practice. Explicitness must be stressed here because some researchers question the possibility that real implicit learning may be "...effective in classroom contexts (as implicit learning often leads to incomplete knowledge with classroom learners), or feasible (given the massive amounts of exposure and time that these processes demand)..." (de Graaf & Housen, 2009, p. 733). In the case of L1 Spanish learners of L2 English, the need for instruction may be more compelling, given the differences in the orthographic depths of the languages involved and the operation of cross-linguistic transfer.

Another aspect to be considered is the impact of phonics on reading performance in terms of lower-level and higher-level processes. As was explained earlier, most reading

accounts emphasize the importance of both processing levels in reading. In particular, word recognition models have posited that lower-level processes are a prerequisite for the execution of more complex reading tasks, such as inferencing and overall comprehension. The automatization of graphophonological information, which was the desired effect of the instruction proposed here (and which seems to have taken place to a great extent with experimental learners), is a necessary component in order to free up space in working memory and thus devote attention to more cognitively-demanding tasks (Khatib & Fat'hi, 2011). Because some L2 learners, even at advanced proficiency levels, may be lacking in the vital bottom-up processing skills, direct intervention can be a useful method to assist these learners, as they “may benefit from remediation so that their expert low-level decision-making capacity becomes automatic and fast” (Birch, 2007, p. 12).

A third implication is related to the potential role of phonics instruction in general L2 knowledge acquisition. Links can be established between grapheme-phoneme relations and vocabulary knowledge and extension. According to Grabe (2009), knowing a word involves having access to at least nine components, which include (but are not limited to) orthography, morphology, parts of speech, pronunciation, meanings, and meaning associations (p. 267). Therefore, it can be stated that learning new words is partly connected with understanding their orthographic and phonological identities. Extending Grabe's description, Huang et al. (2004) assert that “learning vocabulary involves the linkage between sound patterns and the meanings of individual words, and phonological memory may improve new word acquisition” (p. 63). Research has also demonstrated that effective word decoding, along with other skills, may be necessary for the development of overall proficiency in an L2. In fact, as affirmed by Sparks et al. (1997), grapheme-phoneme knowledge “should be considered as a possible predictor of proficiency in a foreign language because acquisition of the new phonological-orthographic system may help students learn to speak and comprehend new words in a foreign language” (p. 557).

In view of the positive results that phonics instruction has produced among experimental learners, practical applications are considered. First, the six ORTHs that were focused in the treatment proposed were successfully taught during a three-week

period, giving an average of two per week. On the basis of this calculation, the number of combinations can be increased to coincide with the total number of teaching weeks throughout the year multiplied by two. In other words, phonics teaching may start from the beginning of the academic year, with a progression of grapheme-to-phoneme mappings from simpler to more challenging. In order for this tentative plan to be feasible, it may be necessary to cut down the amount of time allotted to each ORTH so that EPP teaching may not be exclusively phonics-oriented.

Second, bearing in mind the characteristics of the lessons prepared for this study, a series of well-sequenced activities may be prepared and compiled into units that could be published as a booklet to supplement English pronunciation and (more generally) language instruction. These activities may have the theoretical support of simple rules that guide the acquisition of complex letter-sound combinations and constitute reference for future consultation. Besides, the texts that may be used as lead-in activities might be exploited for vocabulary extension and grammar work as well, thus, integrating different kinds of L2 knowledge.

Third, grapheme-phoneme mapping activities can be used systematically in combination with speech production and perception exercises and phonologically-oriented tasks where sound-meaning relations are exploited (see the 3P trilogy discussed in Dickerson 2013, 2015). In this way, phonics training may provide another tool to help students hone their pronunciation skills and be a vehicle for the integration of the different subsystems used to communicate both in spoken and written language. All this might contribute a sense of fulfillment in the internalization of grapheme-phoneme associations and could bring emotional and motivational support to predict the pronunciations of new words, an essential aspect for L2 English learning, as conceived in the context of FL.

5.3 Limitations of the Study

As already shown in this thesis, the findings provide evidence that for the experimental students participating in this study, phonics instruction produced fruitful results in terms of their ability to produce orally and transcribe words containing the ORTHs examined. However, precisely because of the characteristics of the students (setting, specialized

pronunciation training, and proficiency level, among others), the findings may not generalize to lower-level students or to students not accustomed to using rule presentation as part of their L2 English training, particularly *text-to-speech correspondence rules* (Carney, 1994). It appears reasonable to replicate the study with other populations to see if the instructional treatment can be effective with them and can, therefore, generalize to other types of L2 English learners.

In addition, as was explained above in connection with the quasi-experimental methodology, the lack of random assignment of subjects to control and experimental groups may have worked to the detriment of the internal validity of the research. Nevertheless, as was stated in Chapter 3, several steps were considered to strengthen both internal and external validity, such as pretesting and the presence of a control group (see 3.3.3 and 3.5.1 above). Also, care was taken to schedule testing instances during the same weeks and in the morning periods for both participating groups. Besides, a large number of students were called on to participate from the outset (130 students), because there was expected to be (and there definitely was) an important amount of dropout (more than 50%), even despite the short time elapsed between pretest and posttest.

Another possible limitation of this research may be the fact that, as it was a small-scale study and the execution had to be planned exhaustively, it was necessary to test students' performance on a relatively reduced number of ORTHs. It may be interesting to increase the number of combinations and lengthen the instructional period in order to examine if such conditions yield positive results, similar to or even better than the ones obtained in this investigation.

5.4 Suggestions for Future Research and Final Considerations

On the basis of the implications and limitations of the examination of how phonics instruction impacted on the students' pronunciation skills, it is possible to think of avenues for future research that may expand on and further illuminate the results obtained in the study reported here.

Knowing that graphophonemic instruction can be beneficial for university-level students, it may be interesting to explore the potential durability of the benefits. The literature on the durability of explicit instruction is profuse and the studies conducted so far show mixed findings. Certain studies have revealed that for some morpho-syntactic and pragmatic features taught to adolescents and young adults there may be little or no durable effects (see, for example, Li, 2012; Tode, 2007). In other cases, the effects remained for some time after the treatment (Akakura, 2012). Nevertheless, for more local linguistic features there seems to be more consensus that explicit training effects may be more durable, especially with long-term treatments (Norris & Ortega, 2000; Pérez Cañado, 2005; Saito, 2012). In order to examine durability, it is necessary to include one or several delayed posttests (see, for instance, Norris & Ortega, 2000; Spada & Tomita, 2010).

Another issue that may be taken on board in future investigations is concerned with methodology. In this thesis, on the basis of the objectives set forth at the beginning of the project, a quantitative methodology was employed, as this paradigm typically “involves data collection procedures that result primarily in numerical data which is then analyzed primarily by statistical methods” (Dörnyei, 2011, p. 24). However, it may be argued that in order to produce a more comprehensive understanding and interpretation of the phenomena under study, a mixed-methods approach may be used, in which quantitative and qualitative methodologies of data collection and analysis are combined (Dörnyei, 2011; Riazi & Candlin, 2014). Therefore, the study reported in this thesis may be supplemented with written questionnaires and interviews in order to find out other issues such as attitudes and beliefs about different types of learning letters and sounds in the pronunciation class (see Martínez Martínez, 2011, as described in 2.2.1 above).

Future works may also throw further light on the acquisition of grapheme-phoneme relations with the employment of longitudinal research. It may be revealing to study a group of individuals over an extended period of time and test them at different points in the process to see how their performance may reflect the possible different stages of learning. In effect, this methodology is considered to be “particularly helpful for understanding developmental change or the long-term effects of individual factors”

(Jackson, 2013, p. 404). With a one-year or two-year study, interesting facts may come to the surface in connection with the degree of acquisition of grapheme-phoneme mappings and their interaction with other linguistic features and instructional contexts. For instance, in such time spans, an exploration could be made of how orthography can be used in tandem with word stress rules to predict stress placement, the presence of weak vowels and the possibility of vowel weakening, the forms of suffixes, and variability in pronunciation (Dickerson, 2015).

To sum up, this study has focused on the efficacy of phonics instruction on university-level students' ability to predict the pronunciation and transcribed forms of unfamiliar words. On the basis of the results obtained, it can be stated that the instructional treatment proposed impacted positively on these skills, as experimental students made significant learning gains. Phonics instruction is considered to be a valuable tool to enhance students' pronunciation skills, as it can be an alternative way of teaching English phonetics and phonology. Its application in pronunciation training may pave the way for the implementation of the 3P approach (Dickerson, 1994, 2013, 2015) in which a focus on text content (and, therefore, meaning) can be combined with attention to linguistic form. Finally, it may also give learners some kind of independence in their own learning by equipping them with theoretical notions and providing practice for continual language learning.

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APPENDICES

APPENDIX A. PHONICS INSTRUCTION.

LESSON 1

Topic: The pronunciation of spelling <irC>

Instruction time: 40 to 50 minutes

1) General intro about spelling and orthography. [Brief reference is made to the lack of grapheme-phoneme correspondence in English. Examples are elicited. Make reference to the historical grounds for English spelling-pronunciation divergence.]

2) Read the following text and notice the many ways letter -i- is pronounced. [Instructor should allow up to 10 minutes' reading and discussion between pairs.]

Birds have one of the most complex respiratory systems of all animal groups. Upon inhalation, 75% of the fresh air bypasses the lungs and flows directly into a posterior air sac which extends from the lungs and connects with air spaces in the bones and fills them with air. The other 25% of the air goes directly into the lungs. When the bird exhales, the used air flows out of the lung and the stored fresh air from the posterior air sac is simultaneously forced into the lungs. Thus, a bird's lungs receive a constant supply of fresh air during both inhalation and exhalation. Sound production is achieved using the syrinx, a muscular chamber incorporating multiple tympanic membranes which diverges from the lower end of the trachea. The bird's heart works like a machine and has four chambers like a mammalian heart. In birds the main arteries taking blood away from the heart originate from the right aortic arch (or pharyngeal arch), unlike in the mammals where the left aortic arch forms this part of the aorta.

3) As you may have noticed from the text above, and from any text you may come across, letter -i- is pronounced mostly with the sounds /ɪ/ and /aɪ/. Re-read the text and find examples in which this letter (on its own or combined with other letters) is pronounced with other sounds. Next, sort them into groups on the basis of pronunciation of that letter. You can add other words with similar spellings not appearing in the text. [Instructor should illustrate on board with one of the examples below and elicit the others. If students happen to find other combinations, do add them. Next, write sound between slanted lines and example words as is done below.]

/eə/ <u>air</u>	/i:/ rece <u>ive</u> achie <u>ve</u>	/ɪ or ə/ mult <u>iple</u>	/ɜ:/ b <u>ir</u> d	/i/ mammali <u>a</u> n arteri <u>e</u> s	/eɪ/ mai <u>n</u>	silent letter inhalat <u>i</u> on exhalat <u>i</u> on
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machine

posterior

4) Now consider the letter combination *-ir-* in the text above and in the words listed below. Is it always pronounced the same? [Instructor should elicit the three words from the text (unitalicized below) and copy them together with the italicized ones as follows. The other words do not appear in the text. Afterwards, students should transcribe. Allow some minutes' work. Next, a volunteer or instructor may transcribe on board.]

air
bird
direct
admire
sirloin
disconfirm
inspiration
ironic
besmirch
repertoire
satirize
bairnish
miring

5) What spelling patterns do you find? How are words spelt when this combination is pronounced with /ɜ:/? [Instructor should elicit the rule and copy it on board or show on screen.]

The spelling combination <irC>, when part of the same syllable, is pronounced with /ɜ:/. In general, the syllable is also stressed. If the <ir> combination is followed/preceded by a vowel letter (<irV> or <Vir>), a different vowel sound is used.

6) Transcribe the following words bearing in mind the above rule and then pronounce the words. [Instructor should copy this on board and assign the following words for homework. Students should be asked to transcribe and practice pronouncing them. Exercise will be checked the following lesson. The first one can be transcribed by instructor as an example.]

stirring /stɜ:riŋ/
siren
viral
flair
miring
Girvan

whirligig
antirational
siring
millionaire
girls
extirpate

[Note 1. Instructor is reminded that the instruction phase is expected to have an effect not only on transcription but also on oral decoding. For this reason, any time a word is written/spelt, it should ideally be followed by the oral rendering of such word by the instructor and the subsequent repetition by learners. Thus, the grapheme-phoneme associations are permanently referred to, practiced orally and transcribed. This note applies to all the instances of graphophonemic instruction to be carried out in the framework of this research.

Note 2. The following words are transcribed to simplify instructor's dictionary work. There is no need to transcribe for students consideration, since these words are not in focus.]

exhale: /eks'heɪəl/, /ɪks'heɪəl/, /əks'heɪəl/, /egz'heɪəl/, /ɪgz'heɪəl/, /əgz'heɪəl/

inhale: /ɪn'heɪəl/

sac: /sæk/

inhalation: /'ɪnhə'leɪʃən/

exhalation: /'ekʃə'leɪʃən/

trachea: /trə'ki:ə/, /'treɪkiə/

chamber: /'tʃeɪmbə/

mammalian: /mə'meɪliən/, /mə'mæliən/

arteries: /'ɑ:təriz/

pharyngeal: /'færɪn'dʒi:əl/, /'færən'dʒi:əl/, /fə'rɪndʒiəl/

aortic: /eɪ'ɔ:tɪk/

aorta: /eɪ'ɔ:tə/

LESSON 2

Topic: The pronunciation of spelling <urC>

Instruction time: 35 to 45 minutes

1) As you may have noticed from your experience of English orthography and pronunciation, letter <u> is pronounced in different ways. For example, it can be pronounced /ʌ/, /ʊ/ and /u:/. [Instructor should write the following sound symbols and two example words in bold below for each of the groups. Then students are asked to provide more examples, which they should select from language and pronunciation books.]

/ʌ/	/ʊ/	/u:/
pu<u>tt</u>	pu<u>t</u>	tru<u>th</u>
bru<u>sh</u>	b<u>u</u>sh	J<u>u</u>ne
bun<u>ch</u>	bu<u>ll</u>	assu<u>m</u>e
du<u>mp</u>	fu<u>ll</u>	po<u>ll</u>ute
hu<u>t</u>	pu<u>ll</u>	ju<u>i</u>ce
pl<u>u</u>s	suga<u>r</u>	bru<u>i</u>se
u<u>nd</u>ress	bu<u>ll</u>etin	pu<u>r</u>suit

2) Notice that letter <u> can have other pronunciations. For example, combinations with other consonant or vowel letters can make a difference. Read the following text and notice other possible pronunciations of letter <u>. The text appears in *Upstream Intermediate* (by Evans & Dooley), p. 12. [Instructor should allow some minutes' reading and discussion among pairs.]

BURGLARPROOF YOUR HOME

Can you imagine anything worse than returning home to find burglars have broken into your house? Unfortunately, this happens to about 1 million people in Britain annually. However, if you want better protection against burglars there are several things you can do. To improve security, check all the locks on your doors and windows. The installation of lightning all around the house will make sure a burglar is unable to hide in the shadows. An alarm is another good preventive measure you can take.

Starting a neighbourhood watch group is also a very effective way to prevent crime in your area. Since most burglaries take place when people are away on holiday, this is when your neighbours' help is most valuable. Ask them to collect your mail, open and close your curtains every day, switch your lights on and off and even mow your lawn to make your house look occupied.

[Instructor should write the following vowel sounds and ask students to look for words from the text representing them.]

/ɜ:/ /ʊə/ or /ɔ:/ /ə/ /ʊ/ or /uə/ /aʊ/

[Below are the words students should have picked out.]

/ɜ:/	/ʊə/ or /ɔ:/	/ə/	/ʊ/ or /uə/	/aʊ/
<i>bu<u>rg</u>lars</i>	<i>se<u>cu</u>ry</i>	<i>yo<u>ur</u> (also /ɔ:/)</i>	<i>ann<u>ua</u>l</i>	<i>hou<u>s</u>e</i>
<i>ret<u>ur</u>ning</i>		<i>meas<u>ur</u>e</i>	<i>valu<u>a</u>ble</i>	<i>ar<u>ou</u>nd</i>
<i>cu<u>rt</u>ains</i>		<i>neigh<u>bu</u>rr</i>	<i>occ<u>u</u>py</i>	<i>ab<u>ou</u>t</i>

3) Browse through your language and/or pronunciation books, find more examples of spelling -ur- pronounced /ɜ:/ and add them to the first column.

[Instructor should allow some minutes' pair work and ask students to provide words which will be spelt on board.]

4) Now try to describe the context in which spelling <ur> is pronounced /ɜ:/?

[Instructor should elicit the rule and copy it on board or show on screen.]

The spelling combination <urC>, when part of the same syllable, is pronounced with /ɜ:/. In general, the syllable is also stressed. If the <ur> combination is followed/preceded by a vowel letter (<urV> or <Vur>), a different vowel sound is used.

5) Homework. Transcribe the following words bearing in mind the above rule and then pronounce the words. [Instructor should copy this on board. Students should be asked to transcribe and practice pronouncing them. Exercise will be checked the following lesson. The first one is transcribed by instructor as an example.]

lurk /lɜ:k/
lure
purfling
purity
bury
bulgur
return
liturgy
liturgical

burton
durian
gurgle
accurate
amour
blurt
Burkitt
nocturnal
epicurean

[Note. Instructor is reminded that the instruction phase is expected to have an effect not only on transcription but also on oral decoding. For this reason, any time a word is spelt, it should ideally be followed by the oral rendering of such word by the instructor and the subsequent repetition by learners. Thus, the grapheme-phoneme associations are permanently referred to, practiced orally and transcribed. This note applies to all the instances of graphophonemic instruction to be carried out in the framework of this research.]

LESSON 3

Topic: The pronunciation of letters <tu>

Instruction time: 35 to 45 minutes

1) Read the following text. Use a dictionary to find the meanings of any words you are not familiar with. [Instructor should allow some minutes' pair/group work.]

The End Times have commenced

This is a good time to take a look at what the nature of the "end times" is and how different people view this. "Unfortunately, the end-times have well and truly commenced," said Mike Quinsey earlier this year.

Patricia Peakes captures some of the fear that many people may have when considering the end times: "Deep in our hearts, we have always known that this time would come. World religions and prophecies throughout the Ages have all talked about these 'end times' to occur sometime in the 21st century. The wrath of God has been bandied about lately. Actually, some apocalyptic commentators say "What Humanity is experiencing now has been referred to in various ancient scriptures as the 'time of [weeping] and the gnashing of teeth.'"

Matthew Fox described what things look like from the higher dimensions which terrestrial spirits and galactics together occupy. He said "What we see in your tumultuous world is the result of greed, violence, and anger.

However, other people explain that Biblical prophecies are not going to happen. Here, for instance, is spiritual guru Thomas Lincoln on the subject "...Fear will eventually be replaced by faith in the Plan of God, who will bring you joy and happiness. It will be clear that your future is to lift up out of the darkness, and that a pathway has been created for all living creatures...You have created the opportunity for such changes, and Heaven has responded by moving you out of the lower vibrations."...

(Text adapted from <http://goldenageofgaia.com/the-2012-scenario/the-time-of-troubles/the-end-times/ch-1-the-end-times-will-be-tumultuous/>)

2) Scan the text above for words containing letter -t-. Next, sort these words on the basis of how this letter is pronounced. [After some minutes' reading, students should come up with sounds. If not, instructor should elicit sounds, copy symbols on board and words below each symbol. Since -t- is most frequently pronounced with /t/, instructor is advised to say this and include only a few words in the list, in order not to spend a long time on this straightforward grapheme-to-phoneme correspondence.]

/t/	/θ/	/ð/	/ʃ/	/tʃ/
take	Matthew	this	description	nature
talked	path	that	vibrations	unfortunately

teeth
to
Thomas
apocalyptic

wrath
throughout
teeth
things
faith

the
these
together
other

captures
century
actually
scriptures
tumultuous
eventually
spiritual
future
creature

3) When is letter *-t-* pronounced with sound /tʃ/? Is the syllable it is found in normally stressed? [Elicit rule.]

When letter <t> combines with <u> in an unstressed syllable, it is typically pronounced with /tʃ/. The vowel sound is weak, typically /u/, as in *actual* and *eventual* and /ə/, as in *future* and *scriptures*.

4) Now consider the following words. [Instructor writes the words below on board.]

tune
Tuesday
tube
prostitution

How, according to your dictionary, is *-tu-* pronounced in these cases? Do you think there are differences between standard AmE and standard BrE? [Instructor should inform students that /tj/ is used in both varieties but there is an increasing tendency in the UK to use /tʃ/ and in some US English varieties to use /t/ without /j/.]

5) Homework. Transcribe the following words bearing in mind the above rule and then pronounce the words. Next, choose 3, make your own sentences with them and practice reading the sentences outloud. [Instructor should copy this on board. Students should be asked to transcribe and practice pronouncing them. Exercise will be checked the following lesson. The first one is transcribed by instructor as an example.]

obituary /ə'bitʃuəri/
agriculture
conventional

voluptuary
fixture
infatuated
factualists
gesture
statuary
adventure

[Note. Instructor is reminded that the instruction phase is expected to have an effect not only on transcription but also on oral decoding. For this reason, any time a word is spelt, it should ideally be followed by the oral rendering of such word by the instructor and the subsequent repetition by learners. Thus, the grapheme-phoneme associations are permanently referred to, practiced orally and transcribed. This note applies to all the instances of graphophonemic instruction to be carried out in the framework of this research.]

LESSON 4

Topic: Silent letters: the case of <t>

Instruction time: 35 to 45 minutes

1) Read the following sentences. Then transcribe them in the space provided.

You can use a dictionary. [Instructor allows 10 - 15 minutes' transcriptions and then shows transcription onscreen.]

- a. The plumber's thumb got caught as he climbed the ladder.
- b. There was no sign of the French champagne he'd bought for the party.
- c. "I'll be back in an hour," said the heiress. But it was not an honest reply.
- d. She has a knife in her knickers which could damage your knuckles or your knees.
- e. He could walk for half a mile and talk gently.
- f. They don't often fasten their seatbelts.
- g. My Dad was christened in summer.
- h. There's a trestle table in the verandah.
- i. The whole subject bristles with problems.

2) Re-read the sentences and their transcriptions. Can you notice anything in particular in connection with spelling and pronunciation? [Students should have noticed several letters/letter combinations are silent, namely, not pronounced. If students can't notice, instructor should say it. Next, instructor shows the transcriptions onscreen so that students can check their work.]

3) Draw up a chart and, from the sentences above, sort the words containing silent letters. [Instructor allows some minutes' pair/group. Next volunteers come to board to write letters. Once this is finished, instructor should read the words in the chart and ask students to repeat.]

SILENT LETTERS

-b-

-g-

-h-

-k-

-l-

-t-

plumber's	sign	hour	knife	walk	often
thumb	champagne	heir(ess)	knickers	half	fasten
climbed		honest	knuckles	talk	christened
			knees		trestle
					bristles

4) Most words containing silent letters have a particular spelling combination where the silent letter is present. Re-read the chart and find in what contexts letter *-t-* is silent. [Elicit rule.]

Letter <t> is usually silent in the combinations *-sten* and *-stle*. This applies even when endings are added to these words, for example *listener* and *bristling*. This letter is sometimes silent with other spelling combinations and words, for instance *often* and *chalet*.

5) Homework. Transcribe the following words. Notice that in some cases *-t-* is not silent. Next, choose 2, make your own sentences with them and practice reading the sentences aloud. [Instructor should copy this on board. Students should be asked to transcribe and practice pronouncing them. Exercise will be checked the following lesson. The first one is transcribed by instructor as an example.]

chastened	frighten
beret	castles
thistle	buffet
fastener	whistling
jostling	smitten
rotten	gentle

[Note. Instructor is reminded that the instruction phase is expected to have an effect not only on transcription but also on oral decoding. For this reason, any time a word is spelt, it should ideally be followed by the oral rendering of such word by the instructor and the subsequent repetition by learners. Thus, the grapheme-phoneme associations are permanently referred to, practiced orally and transcribed. This note applies to all the instances of graphophonemic instruction to be carried out in the framework of this research.]

LESSON 5

Topic: The pronunciation of the adjectival suffix <ous>

Instruction time: 35 to 45 minutes

- 1) Read the following text, which was slightly adapted from *Upstream Intermediate*, and underline the words ending in letter –s. These words may be nouns, adjectives or verbs. [Instructor should allow 5-10 minutes' reading so that students can identify words. The text will be shown onscreen.]

More exercise, less stress?

Do you know how dangerous stress can be? It affects us both physically and mentally, so reducing stress is something that we should all try to do. While many people feel that the best way to get rid of stress is some form of exercise, there are other ways which are just as effective.

The benefits of physical exercise are obvious. First of all, keeping fit helps your body stay strong and healthy. Therefore you are less likely to get sick or suffer from continuous stress-related health problems. Furthermore, exercise is a good way to get rid of frustration and anger, because after exercise the brain produces hormones called endorphins which make us feel good.

On the other hand, if you are out of shape, exercise can be quite painful. You may pull a muscle or injure yourself. Furthermore, enormous amounts of exercise may even cause more stress since it will add to your already hectic schedule.

In conclusion, the best way to combat stress in our lives is to live a healthy life. As James Freeman Clarke says, "Never hurry. Take plenty of exercise. Always be joyous. Take all the sleep you need. You may expect to be well."

- 2) Say the words you have found. [Instructor now elicits the words and copies them on board. Students may also name words ending in –se. These words can be included.]

dangerous
stress
affects
exercise
ways
helps
obvious
less
continuous
problems

produces
hormones
endorphins
enormous
amounts
lives
James
says
joyous

- 3) **Group the nouns and verbs on the basis of the pronunciation of the endings: /s/, /z/ or /ɪz/. [Reviewing already introduced concepts, instructor writes columns and sorts words according to the endings, as students say them. Eventually reference can be made to the fricative endings of other words, such as *stress, exercise* and *less*.]**
- 4) **What category do the following words belong to: *dangerous, obvious, continuous, joyous, enormous*? What else do they have in common? Transcribe these words. [Instructor should elicit the following info: 1) these are adjectives & 2) they have the same ending. Students should volunteer to transcribe the words on board.]**

dangerous: /'deɪndʒərəs/

obvious: /'ɒbvɪəs/

continuous: /kən'tɪnjuəs/ or /kɒn'tɪnjuəs/

joyous: /'dʒɔɪəs/

enormous: /i'nɔ:məs/ or /ə'nɔ:məs/

[Instructor should remind students of the pronunciation of these words by saying “We don’t say /'deɪnʃərəs/, we say /'deɪndʒərəs/”, and emphasizing the ending. Instructor then says the other four words and students repeat chorally. Next, instructor elicits rule.]

The adjective suffix (=ending) <ous> is always pronounced /əs/. It should never be pronounced /us/ or /uz/.

5) **Homework**

A. Transcribe the following words. Next, choose 2, make your own sentences with them and practice reading the sentences aloud.

commodious
covetous
meritorious
gorgeous
coterminous
rambunctious
adventurous
miscellaneous
populous
noxious
propitious
wondrous

B. Look through the set of stories for retelling for adjectives containing the suffix *-ous*. Transcribe the words and read them aloud.

LESSON 6

Topic: The pronunciation of ending <tion>

Instruction time: 35 to 45 minutes

- 1) **WORDSEARCH GAME.** In pairs, find the transcription for the words below. Each of these words may be in any direction. There is a prize for the winning pair. [Students are given as long as necessary to solve the puzzle. Since there are distractor transcriptions (see key attached), students may choose wrong transcriptions. If a pair finishes first but has found wrong transcriptions, the game is not over since that pair has not won. Game continues until a pair has come up only with correct transcriptions. During game, instructor can suggest that spelling is important in deciding whether the voiced or the voiceless variants are used.]

i:	t	f	j	ɒ	n	s	ɔ:	p	ɒ	l	ʌ	s	i	ɒ	ŋ
tʃ	p	β	ʌ	v	ɪ	l	i	ɣ	k	ʌ	ʊ	ɒ	θ	a:	p
o	c	ð	β	f	k	ʊə	ɛ	b	d	k	ə	l	u:	ʒ	ŋ
i	o	ʌ	t	s	s	h	f	z	w	əʊ	h	ʒ	a:	θ	m
dʒ	l	m	p	u:	p	k	l	x	ŋ	ɲ	ʌ	eɪ	z:	l	ð
u	u:	b	e	i	l	d	z	c	v	l	z:	ɲ	ŋ	r	ɪ
y	s	æ	n	t	əʊ	v	i	x	b	n	ʊ	j	ʃ	ɱ	u
t	i	l	ʃ	ɔʌ	ʒ	eɪ	n	s	j	m	,	'	n	ʃ	θ
r	ə	β	ŋ	s	ŋ	ʃ	ɒ	f	ɪ	r	aʊ	l	æ	s	ɔɪ
e	n	eə	aʊ	l	ɰ	ŋ	β	ɣ	ʊ	ʒ	l	m	k	u	m
w	θ	f	u	ʔ	ɪə	ʒ	r	s	ɪ	ɔ:	ŋ	n	s	dʒ	ə
ʊə	ʊ	ɥ	ð	n	ʒ	ɪ	s	l	əʊ	t	u	b	ɒ	ɸ	ʌ
p	e	n	ʒ	ɒ	n	v	p	w	r	e	b	i	ʃ	r	p
z	(ʌ	æ	s	x	ə	ɸ	ɪə	s	p	ɸ	m	,	h	i:
i	q	\$	ç	ʒ	e	r	w	n	。	β	dʒ	o	ɪ	t	l
a	ɸ	'	χ	t	eɪ	z:	m	n	ɔ	æ	aʊ	i	ɰ	ʃ	ɹ
e	n	θ	ɪ	g	s	p	l	əʊ	ʃ	n	l	θ	ɲ	ɥ	ŋ
u:	d	n	ə	ʃ	u:	l	ə	p	ð	eə	ʊ	t	ɱ	g	u

explosion
pension
collusion
decision
scansion
revision
mission
pollution

- 2) Ending *-ion* can be preceded with *s*, *ss* or *t*. Look at the transcription of each word and say when we use /ʃ/ and /ʒ/. [If students don't realize, instructor should suggest that spelling is important in deciding whether the voiced or the voiceless variants are used.]
- 3) Consider the following words and transcribe them phonemically. What do these words suggest in terms of spelling and pronunciation? [Instructor allows some minutes' work.]

cohesion *ascension* *commission* *admiration* *aversion* *expulsion*

- 4) [Instructor elicits rule.]

When preceded by a vowel letter, ending <ion> is pronounced /ʒn/ or /ʒən/, as in *cohesion*. When a consonant precedes, the pronunciation is usually /ʃn/ or /ʃən/, as in *ascension*, *commission*, *expulsion*. If the consonant is *-r-*, as in *aversion*, the pronunciation can be /ʒ/ or /ʃ/. If the spelling is <tion>, it will always be /ʃn/ or /ʃən/.

5) Classwork

A. Transcribe the following words and practice reading them aloud.

derision
omission
scansion
detention
collusion
eclosion
dispersion
condescension
dissuasion
illusion

B. Look through the set of stories for retelling for nouns ending with the suffix *-sion* or *-tion*. Say these words aloud taking care to pronounce /ʃ/ or /ʒ/ as appropriate.

APPENDIX B. TESTS.

1. ORAL PRETEST

Read the sentences below silently. Then read them aloud using weak and strong forms of pronunciation when necessary and pronouncing endings of verbs and nouns carefully. Your reading should be comfortably fluent, neither too fast nor too slow.

In the children's comedy *The House of Gristle* there was an actor who was always making pestering gurgling sounds.

Eclasion was designed to help academics. It was among Mormon universities that its use became propitious.

George's life was terribly voluptuary. But that didn't matter to him and really didn't besmirch his reputation at all.

Bob puts his guitar anywhere. So in order to resist abrasion and scratching, it should have binding and purfling on the edges.

My terrier has been siring puppies for three years. In order to train newly born dogs I always like squirting them with water.

In Dr. Girvan's philosophical writings, it is clearly demonstrated that existence and essence are both coterminous.

We spent the whole time eating durians, kiwis and other exotic fruits. That was our quiet evening in, gone for a burton.

To see third parties tracking their movements, users should download Collusion, an add-on for Firefox.

The kid was incredibly rambunctious. He was toying with the thistle and then the prickles dug into his hand, causing great pain.

My niece Audrey was christened in 1979 by a priest belonging to the Order of the Conventual Franciscans.

It was really incredible that the explication of the sonnet's scansion appeared in the obituaries section.

WORDS TO BE STUDIED

<irC> /ɜː/

Girvan
squirting
besmirch
siring (exception)

<urC> /ɜː/

purfling
burton
gurgling
durians (exception)

silent <t>

christened
gristle
thistle

<ous> /əʊs/

coterminous
rambunctious
propitious

<sion> /ʒən/

collusion
abrasion
eclosion
scansion (exception)

<tu> /tʃu/

obituaries
conventual
voluptuary

2. ORAL POSTTEST

Read the sentences below silently. Then read them aloud using weak and strong forms of pronunciation when necessary and pronouncing endings of verbs and nouns carefully. Your reading should be comfortably fluent, neither too fast nor too slow.

When the rocks are dry, the structure is less conspicuous, but it becomes beautifully apparent when they are moistened.

After a few dirgeful words by mourning family members and friends, the body was taken directly from the mortuary to the funeral home.

It was a great surprise for the village people to hear that the Squire of Birmingham was actually a rustler and stone-cold killer.

We can protect the soil surface from erosion with several plant species, especially the ones known as herbaceous.

A poor observing quality usually blurs the images of astronomical objects. But the equinoctial colure can be seen with these binoculars.

The burgeoning spread of technology in our country seems to go hand in hand with the pervasion of mass media influences.

The use of moral suasion by the British military contrasted sharply with the quirkiness and the irresponsibility of the Argentine military.

With official newspapers regurgitating such Pentagon propaganda, aggression against Iran would inevitably eventuate.

The authorities showed no apprehension that the houses recently built for the poor in that neighbourhood were totally insalubrious.

Mr. Kirkwood declared that the fluctuant population of tourists is constantly hustling locals into moving away to more peaceful and quieter parts of town.

WORDS TO BE STUDIED

<irC> /ɜː/

dirgeful

quirkiness

Kirkwood

squire (exception)

<urC> /ɜː/

regurgitate

burgeoning

blurs

colure (exception)

silent <t>

moistened

hustling

rustler

<ous> /əs/

conspicuous

insalubrious

herbaceous

<sion> /ʒən/

erosion

suasion

pervasion

apprehension (exception)

<tu> /tʃu/

mortuary

fluctuant

eventuate

3. WRITTEN PRETEST

Por la presente, autorizo al Prof. Martín Capell a disponer de los datos obtenidos tanto de la actividad escrita que realizaré a continuación como de la muestra de mi producción oral en inglés grabada en el día de hoy por él y/o su/s asistente/s. Asimismo, acepto que dichos datos sean utilizados por el profesor Capell únicamente con fines investigativos, por lo que no serán tenidos en cuenta para otorgarme ninguna calificación, ya sea parcial o definitiva. El docente tampoco podrá divulgar los datos personales que declaro a continuación.

Firma: _____

Aclaración: _____

Fecha: _____

Marcar lo que corresponda:

Año de cursado: 1º 2º 3º

Completar si corresponde:

Estudié/viví ___ años/meses en un país de habla inglesa.

Estudié inglés ___ años en una institución privada.

Read the following sentences. Next, in the space provided below each sentence transcribe phonemically only the words underlined. Remember to consider weak and strong forms of pronunciation and endings of verbs and nouns whenever necessary.

1) Some gorillas can be excessively covetous of food and show a lot of condescension.

2) William Burkitt is badly infatuated with a workmate but he always bristles at the slightest joke about the issue.

3) I gave him a whirligig as a present and he hung it in his commodious living room.

4) The father smiled mirthlessly and then blurted out the name of the culprit.

Afterwards, there were shouts of derision from his children.

5) The repair of the statuary in the city is a duty not to be shirked by the local government. Nothing should be more important.

6) This house offers a verandah all along the side with a fine trestle table and good sea view. It's definitely wondrous.

7) It is said that dissuasion is increasingly being used by the American military. It is a way to chasten people considered a threat.

8) A minging ceremony is a colourful and noisy ceremony conducted to please the gods. It is typically not performed as a nocturnal rite.

9) Epicurean pleasures include deep satisfactions like friendship and community, but also delights that gratify the senses.

10) Semanticists claim there is no doubt about the inhesion of polysemy in human language but factualists do not seem to agree.

WORDS TO BE STUDIED

<irC> /ɜː/

mirthlessly

whirligig

shirked

miring (exception)

<urC> /ɜː/

blurled

Burkitt

nocturnal

Epicurean (exception)

silent <t>

chasten

bristle

trestle

<ous> /əs/

wondrous

commodious

covetous

<sion> /ʒən/

inhesion

derision

dissuasion

condescension (exception)

<tu> /tʃu/

infatuated

factualists

statuary

4. WRITTEN POSTTEST

Por la presente, autorizo al Prof. Martín Capell a disponer de los datos obtenidos tanto de la actividad escrita que realizaré a continuación como de la muestra de mi producción oral en inglés grabada en el día de hoy por él y/o su/s asistente/s. Asimismo, acepto que dichos datos sean utilizados por el profesor Capell únicamente con fines investigativos, por lo que no serán tenidos en cuenta para otorgarme ninguna calificación, ya sea parcial o definitiva. El docente tampoco podrá divulgar los datos personales que declaro a continuación.

Firma: _____

Aclaración: _____

Fecha: _____

Marcar lo que corresponda:

Año de cursado: 1º 2º 3º

Completar si corresponde:

Estudié/viví ___ años/meses en un país de habla inglesa.

Estudié inglés ___ años en una institución privada.

Read the following sentences. Next, in the space provided below each sentence transcribe phonemically only the words underlined. Remember to consider weak and strong forms of pronunciation and endings of verbs and nouns whenever necessary.

1) Estuary View is a magnificent new development of holiday homes. It is located

within walking distance of the bustling market area.

2) Seeing that he wouldn't stop burbling about his own intelligence, I hastened to

introduce a more interesting topic into the conversation.

3) Obama suddenly smirked when Romney said he would have given order to kill bin

Laden. Everybody thought Romney was disingenuous in saying that.

4) Ringing ears refers to swishing, chirping, and other sounds heard within the ears. In

some cases, the sound may be felt as intense as an implosion.

5) To conduct that kind of experiment, students should have used a mortar and pestle, a burette and other measuring tools.

6) There were a record number of head-on collisions on the road, which shows that the recent measures were not effectual at all.

7) Circumcision of newborns has been perpetuated in many societies and cultures because of its merit as a successful surgical health measure.

8) That pamphlet is a work of political satire by Mark Twain. The king prides himself on the disbursement of millions on religion and art.

9) Twirling the drumstick with surprising ease, James grinned and said, 'I think this calls for an extemporaneous practice session!'

10) The Board was pleased to read a recension Ms. Turpin had written of the text entitled "The Origins of Man's Selfishness."

11) The first systems were asynchronous, which meant that their stimulus rate and energy level were set by the electronics.

WORDS TO BE STUDIED

<irC> /ɜː/

twirling
smirked
chirping
satire (exception)

<urC> /ɜː/

disbursement
burbling
Turpin
burette (exception)

silent <t>

hastened
pestle
bustling

<ous> /əs/

disingenuous
extemporaneous
asynchronous

<sion> /ʒən/

circumcision
implosion
collisions
recension (exception)

<tu> /tʃu/

estuary
effectual
perpetuated

APPENDIX C. ADDITIONAL TABLES.

1. MEANS ANALYSIS

GA ORAL TASK

ORTHs	PRETEST				POSTTEST			
	Means	S.E.	LL (95%)	UL (95%)	Means	S.E.	LL (95%)	UL (95%)
<ous>	26.00	4.25	17.34	34.66	79.61	5.04	69.34	89.87
<sion>	31.82	3.96	23.74	39.89	53.03	4.71	43.43	62.63
<urC>	62.12	5.12	51.70	72.54	82.58	3.17	76.12	89.03
<tu>	20.00	4.53	10.78	29.22	64.33	5.43	53.27	75.39
silent <t>	34.09	5.68	22.51	45.67	57.21	5.09	46.85	67.57
<irC>	34.09	4.96	23.98	44.20	70.45	4.92	60.43	80.48

ORTHs	PRE	POST	OUTCOMES* (GAINS / LOSSES) %
	Means (%)		
<ous>	26.00	79.61	53.61
<sion>	31.82	53.03	21.21
<urC>	62.12	82.58	20.46
<tu>	20.00	64.33	44.33
silent <t>	34.09	57.21	23.12
<irC>	34.09	70.45	36.36

GA WRITTEN TASK

ORT Hs	PRETEST				POSTTEST			
	Means	S.E.	LL (95%)	UL (95%)	Means	S.E.	LL (95%)	UL (95%)
<ous>	33.09	6.12	20.62	45.56	83.79	5.83	71.90	95.67
<sion>	27.27	2.52	22.14	32.41	53.79	6.07	41.42	66.15
<urC>	50.00	4.74	40.34	59.66	76.52	4.21	67.95	85.08
<tu>	27.09	5.68	15.52	38.67	68.42	5.81	56.60	80.25
silent <t>	26.12	6.59	12.71	39.54	55.30	6.59	41.87	68.73
<irC>	49.24	6.01	37.01	61.48	74.24	4.42	65.24	83.24

ORTHs	PRE	POST	OUTCOMES* (GAINS / LOSSES) %
	Means (%)		
<ous>	33.09	83.79	50.70
<sion>	27.27	53.79	26.52
<urC>	50.00	76.52	26.52
<tu>	27.09	68.42	41.33
silent <t>	26.12	55.30	29.18
<irC>	49.24	74.24	25.00

GB ORAL TASK

ORTHs	PRETEST				POSTTEST			
	Means	S.E.	LL (95%)	UL (95%)	Means	S.E.	LL (95%)	UL (95%)
<ous>	39.97	6.26	27.15	52.78	35.41	6.38	22.35	48.48
<sion>	42.24	5.42	31.13	53.35	37.93	5.21	27.26	48.60
<urC>	53.45	4.92	43.37	63.53	49.14	4.38	40.16	58.12
<tu>	27.31	4.93	17.21	37.41	31.86	3.83	24.01	39.72
silent <t>	49.07	5.63	37.54	60.60	33.10	6.59	19.61	46.60
<irC>	35.34	4.56	26.00	44.69	39.66	5.48	28.43	50.88

ORTHs	PRE	POST	OUTCOMES* (GAINS / LOSSES) %
	Means (%)		
<ous>	39.97	35.41	-4.56
<sion>	42.24	37.93	-4.31
<urC>	53.45	49.14	-4.31
<tu>	27.31	31.86	4.55
silent <t>	49.07	33.10	-15.97
<irC>	35.34	39.66	4.32

GB WRITTEN TASK

Sonidos	PRETEST				POSTTEST			
	Means	S.E.	LL (95%)	UL (95%)	Means	S.E.	LL (95%)	UL (95%)
<ous>	28.59	6.75	14.76	42.41	35.48	7.90	19.29	51.67
<sion>	34.48	4.87	24.50	44.46	40.52	4.54	31.21	49.83
<urC>	48.28	5.94	36.11	60.45	62.93	5.06	52.57	73.29
<tu>	13.72	5.35	2.76	24.69	10.28	4.69	0.68	19.87
silent <t>	34.28	7.27	19.38	49.17	24.00	6.15	11.40	36.60
<irC>	43.10	6.55	29.68	56.53	37.07	5.35	26.10	48.04

ORTHs	PRE	POST	OUTCOMES* (GAINS / LOSSES) %
	Means (%)		
<ous>	28.59	35.48	6.89
<sion>	34.48	40.52	6.04
<urC>	48.28	62.93	14.65
<tu>	13.72	10.28	-3.44
silent <t>	34.28	24.00	-10.28
<irC>	43.10	37.07	-6.03

* Gains are represented with positive numbers and losses with negative numbers.

2. VARIABILITY ANALYSIS

2.1 GA WRITTEN TASK PRE- AND POSTTEST VARIABILITY

ORTHs	WRITTEN PRETEST			WRITTEN POSTTEST		
	Means	SD	CV	Means	SD	CV
<ous>	33.09	35.18	106.31	83.79	33.52	40.00
<sion>	27.27	14.47	53.07	53.79	34.87	64.82
<urC>	50.00	27.24	54.49	76.52	24.16	31.57
<tu>	27.09	32.64	120.49	68.42	33.35	48.74
silent <t>	26.12	37.83	144.83	55.30	37.87	68.48
<irC>	49.24	34.51	70.08	74.24	25.38	34.18

GB WRITTEN TASK PRE- AND POSTTEST VARIABILITY

ORTHs	WRITTEN PRETEST			WRITTEN POSTTEST		
	Means	SD	CV	Means	SD	CV
<ous>	28.59	36.35	127.15	35.48	42.56	119.94
<sion>	34.48	26.23	76.07	40.52	24.47	60.40
<urC>	48.28	32.00	66.28	62.93	27.24	43.28
<tu>	13.72	28.82	209.96	10.28	25.23	245.56
silent <t>	34.28	39.17	114.27	24.00	33.12	138.01
<irC>	43.10	35.29	81.87	37.07	28.83	77.78

2.2 DESCRIPTIVE TABLES SHOWING PRE- AND POSTTEST PERFORMANCE IN % AMONG STUDENTS, SORTED BY TASK AND ORTH.

ORAL TASK

1.- <ous>

GB					
POS PRE	0	33	66	100	Total PRE
0	5	2	1	0	8
33	5	5	1	0	11
66	0	3	2	1	6
100	0	1	0	3	4
Total POS	10	11	4	4	29

GA					
POS PRE	0	33	66	100	Total PRE
0	1	3	3	6	13
33	0	2	3	9	14
66	0	0	1	5	6
100	0	0	0	0	0
Total POS	1	5	7	20	33

2.- <ision>

GB						
POS PRE \	0	25	50	75	100	Total PRE
0	0	3	0	0	0	3
25	2	11	0	0	0	13
50	0	3	2	0	1	6
75	0	2	0	0	2	4
100	0	0	0	3	0	3
Total POS	2	19	2	3	3	29

GA						
POS PRE \	0	25	50	75	100	Total PRE
0	1	1	1	4	0	7
25	1	6	4	1	1	13
50	0	1	2	5	2	10
75	0	0	3	0	0	3
100	0	0	0	0	0	0
Total POS	8	14	8	3	0	33

3.- <urC>

GB						
POS PRE \	0	25	50	75	100	Total PRE
0	0	2	0	0	0	2
25	1	2	2	1	0	6
50	0	1	7	1	0	9
75	1	1	2	5	1	10
100	0	0	2	0	0	2
Total POS	2	6	13	7	1	29

GA						
POS PRE \	0	25	50	75	100	Total PRE
0	0	0	0	0	0	0
25	0	0	3	3	2	8
50	0	0	2	7	2	11
75	0	0	0	2	2	4
100	0	0	0	1	9	10
Total POS	0	0	5	13	15	33

4.- <tu>

GB					
POS PRE \	0	33	66	100	Total PRE
0	3	9	0	0	12
33	2	7	1	0	10
66	1	2	4	0	7
100	0	0	0	0	0
Total POS	6	18	5	0	29

GA					
POS PRE \	0	33	66	100	Total PRE
0	2	7	7	3	19
33	0	1	2	5	8
66	0	1	2	3	6
100	0	0	0	0	0
Total POS	2	9	11	11	33

5.- silent <t>

GB					
POS PRE \	0	33	66	100	Total PRE
0	3	1	0	0	4
33	7	2	2	0	11
66	3	3	3	1	10
100	0	0	2	2	4
Total POS	13	6	7	3	29

GA					
POS PRE \	0	33	66	100	Total PRE
0	2	6	3	1	12
33	0	4	5	2	11
66	0	2	3	2	7
100	0	0	1	2	3
Total POS	2	12	12	7	33

6.- irC

GB						
POST PRE	0	25	50	75	100	Total PRE
0	3	2	0	0	0	5
25	1	6	4	1	0	12
50	1	2	0	4	0	7
75	0	1	2	0	2	5
100	0	0	0	0	0	0
Total POS	5	11	6	5	2	29

GA						
POS PRE	0	25	50	75	100	Total PRE
0	0	2	3	2	1	8
25	0	3	2	2	6	13
50	0	0	3	1	1	5
75	0	0	1	1	4	6
100	0	0	0	0	1	1
Total POS	0	5	9	6	13	33

WRITTEN TASK

1.- ous

GB					
POS PRE	0	33	66	100	Total PRE
0	11	1	1	2	15
33	4	0	2	1	7
66	0	0	3	0	3
100	1	0	0	3	4
Total POS	16	1	6	6	29

GA					
POS PRE	0	33	66	100	Total PRE
0	2	2	0	11	15
33	0	1	0	5	6
66	1	0	1	7	9
100	0	0	0	3	3
Total POS	3	3	1	26	33

2.- sion

GB						
POS PRE	0	25	50	75	100	Total PRE
0	1	2	1	0	0	4
25	0	15	2	0	0	17
50	0	0	0	2	0	2
75	0	0	1	4	0	5
100	0	0	0	0	1	1
Total POS	1	17	4	6	1	29

GA						
POS PRE	0	25	50	75	100	Total PRE
0	1	2	0	0	0	3
25	0	13	2	2	8	25
50	0	1	1	0	2	4
75	0	0	0	1	0	1
100	0	0	0	0	0	0
Total POS	1	16	3	3	10	33

3.- <urC>

GB						
POS PRE \	0	25	50	75	100	Total PRE
0	2	3	0	1	0	6
25	0	0	1	1	1	3
50	0	0	4	6	0	10
75	0	1	1	4	2	7
100	0	0	0	2	1	3
Total POS	2	3	6	14	4	29

GA						
POS PRE \	0	25	50	75	100	Total PRE
0	1	0	0	1	0	2
25	1	0	1	6	2	10
50	0	0	1	4	5	10
75	0	0	0	6	2	8
100	0	0	0	2	1	3
Total POS	2	0	2	19	10	2

4.- <tu>

GB					
POS PRE \	0	33	66	100	Total PRE
0	19	2	1	0	22
33	3	0	1	0	4
66	1	0	0	0	1
100	1	0	0	1	2
Total POS	24	2	2	1	29

GA					
POS PRE \	0	33	66	100	Total PRE
0	1	6	5	4	16
33	2	0	4	4	10
66	0	0	1	3	4
100	0	0	0	3	3
Total POS	3	6	10	14	33

5.- silent <t>

GB					
POS PRE \	0	33	66	100	Total PRE
0	13	2	0	0	15
33	1	1	0	0	2
66	2	3	1	2	8
100	0	2	1	1	4
Total POS	16	8	2	3	29

GA					
POS PRE \	0	33	66	100	Total PRE
0	7	6	5	3	21
33	0	1	0	1	2
66	0	0	3	3	6
100	0	0	1	3	4
Total POS	7	7	9	10	33

6.- <irC>

GB						
POS PRE \	0	25	50	75	100	Total PRE
0	4	1	1	0	0	6
25	3	4	2	1	0	10
50	0	1	2	1	0	4
75	0	0	1	2	1	4
100	0	2	2	1	0	5
Total POS	7	8	8	5	1	29

GA						
POS PRE \	0	25	50	75	100	Total PRE
0	0	1	2	1	1	5
25	0	1	3	5	1	10
50	0	0	1	0	4	5
75	0	1	2	0	4	7
100	0	0	0	3	3	6
Total POS	0	3	8	9	13	33

3. INTERRATER RELIABILITY ANALYSIS

GA

ORAL PRETEST

R1	R2							Total
	0	25	33	50	66	75	100	
0	5	0	1	0	0	0	0	6
25	0	2	0	1	0	0	0	3
33	0	0	5	0	0	0	0	5
50	0	0	0	6	0	0	0	6
66	0	0	0	0	5	0	0	5
75	0	0	0	0	0	1	1	2
100	0	0	0	0	0	0	3	3
Total	5	2	6	7	5	1	4	30

ORAL POSTTEST

R1	R2							Total
	0	25	33	50	66	75	100	
0	0	0	0	0	0	0	0	0
25	0	1	0	0	0	0	0	1
33	0	0	2	0	0	0	0	2
50	0	0	0	3	0	0	0	3
66	0	0	0	0	2	0	0	2
75	0	0	0	0	0	5	0	5
100	0	0	0	0	2	1	14	17
Total	0	1	2	3	4	6	14	30

GB**ORAL PRETEST**

R1	R2							Total
	0	25	33	50	66	75	100	
0	4	0	0	0	0	0	0	4
25	0	6	0	0	0	0	0	6
33	0	0	5	0	0	0	0	5
50	0	0	0	3	0	0	0	3
66	0	0	0	0	6	0	0	6
75	0	0	0	0	0	3	0	3
100	0	0	0	0	1	1	1	3
Total	4	6	5	3	7	4	1	30

ORAL POSTTEST

R1	R2							Total
	0	25	33	50	66	75	100	
0	6	0	0	0	0	0	0	6
25	0	7	0	0	0	0	0	7
33	0	0	5	0	0	0	0	5
50	0	0	0	5	0	0	0	5
66	0	0	2	0	2	0	0	4
75	0	0	0	0	0	1	0	1
100	0	0	0	0	0	0	2	2
Total	6	7	7	5	2	1	2	30

4. INFERENTIAL STATISTICS FOR MEANS (PERFORMANCES OF GA AND GB SORTED BY ORTH AND TASK).

1.- <ous>

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	26.00	79.61	-53.61	31.10	-64.63	-42.58	-9.90	<0.0001
GB	29	39.97	35.41	4.55	27.63	-5.96	15.06	0.89	0.3826

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	33.09	83.79	-50.70	44.11	-66.34	-35.06	-6.60	<0.0001
GB	29	28.59	35.48	-6.90	40.13	-22.16	8.37	-0.93	0.3626

2.- <sion>

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	31.82	53.03	-21.21	31.94	-32.54	-9.89	-3.81	0.0006
GB	29	42.24	37.93	4.31	23.21	-4.52	13.14	1.00	0.3259

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	27.27	53.79	-26.52	33.04	-38.23	-14.80	-4.61	0.0001
GB	29	34.48	40.52	-6.03	14.42	-11.52	-0.55	-2.25	0.0322

3.- <urC>

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	62.12	82.58	-20.45	23.76	-28.88	-12.03	-4.94	<0.0001
GB	29	53.45	49.14	4.31	27.60	-6.19	14.81	0.84	0.4075

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	50.00	76.52	-26.52	29.27	-36.90	-16.13	-5.20	<0.0001
GB	29	48.28	62.93	-14.66	24.57	-24.00	-5.31	-3.21	0.0033

4.- <tu>

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	20.00	64.33	-44.33	31.84	-55.62	-33.04	-8.00	<0.0001
GB	29	27.31	31.86	-4.55	26.05	-14.46	5.36	-0.94	0.3548

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	27.09	68.42	-41.33	35.31	-53.85	-28.81	-6.72	<0.0001
GB	29	13.72	10.28	3.45	29.82	-7.90	14.79	0.62	0.5385

5.- silent <t>

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	34.09	57.21	-23.12	31.64	-34.34	-11.90	-4.20	0.0002
GB	29	49.07	33.10	15.97	28.85	4.99	26.94	2.98	0.0059

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	26.12	55.30	-29.18	35.06	-41.61	-16.75	-4.78	<0.0001
GB	29	34.28	24.00	10.28	29.66	-1.01	21.56	1.87	0.0726

6.- irC

a) Oral task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	34.09	70.45	-36.36	31.92	-47.68	-25.04	-6.54	<0.0001
GB	29	35.34	39.66	-4.31	25.06	-13.84	5.22	-0.93	0.3623

b) Written task

GROUP	N	Mean (PRE)	Mean (POS)	Mean (DIFF)	SD (DIFF)	LL (95%)	UL (95%)	t	p-value
GA	33	49.24	74.24	-25.00	34.80	-37.34	-12.66	-4.13	0.0002
GB	29	43.10	37.07	6.03	31.09	-5.79	17.86	1.05	0.3049