Dissertation Proposal

Effects of Visual Instruction on Second Language Productive Phonology

Jilani Warsi Boston University May 1998

I. Introduction

The acquisition of second language productive phonology is seldom ever completely successful with adult learners. Most researchers contend that adult learners cannot achieve native-like phonology in their second language (L2), and attribute the failure, principally, to language transfer and age-dependent factors. For example, Scovel (1969, 1988) maintains that no adult ever achieves native-like pronunciation in a L2. Some researchers suggest that successful attainment of L2 phonology is extremely rare (Oyama, 1976; Flege & Fletcher, 1992; Fledge, Munro, & MacKay, 1995a; Young-Scholten, 1995). However, with individualized practice, there is evidence that the learners' performance is improved (Hill, 1970; Neufeld, 1977; Archibald, 1992). These researchers argue that second language productive phonology is attainable regardless of the learner's age and first language. They maintain that there are methods that can enhance the teaching of L2 pronunciation and that can help students acquire native or near-native proficiency in pronunciation. The present study builds on this direction of instruction.

This study proposes to test the hypothesis that adult learners practicing L2 sounds, with the ability to see on a diagram articulatory movements (point and manner of articulation) and conscious modifications of their researcher-prompted output, will approximate closer the target sounds, with the result of more native-like production and a more rapid progress. The idea behind the proposal is that it isn't just practice of sounds that improves the productive phonology, but informed practice. Teachers may give feedback to the student, but my hypothesis is that instruction that can be seen and then the output that can be modified will work better. The hypothesis is based on the

assumption that the acquisition of new L2 speech sounds by adult language learners is facilitated by visual instruction.

II. Second Language Pronunciation: Contention and Consensus

The acquisition of second language productive phonology by adult language learners has been a contentious issue among second language acquisition researchers. Opinion is sharply divided between those who espouse that successful acquisition of pronunciation in a L2 is impossible to attain after puberty (Krashen, Scarcella, & Long, 1979; Cook, 1991; Ellis, 1994; Harley, 1986; Long, 1990; Snow and Hoefnagel-Hohle, 1978a, 1978b), and those who espouse that adult language learners can achieve native-like pronunciation in their L2 with the aid of effective teaching methods (Ekstrand, 1978; Hill, 1970; Neufeld, 1977; Singleton, 1989, 1992; Ervin-Tripp, 1974; Olson & Samuels, 1973; Bongaerts, Planken, & Schils, 1992).

As Selinker (1972) points out, the most important fact concerning L2 phonology is the phenomenon of fossilization. He claims that "fossilizable linguistic phenomena are linguistic items, rules, and subsystems which speakers of a particular native language will tend to keep in their interlanguage relative to a particular target language, no matter what the age of the learner or amount of explanation or instruction he receives in the target language."

Selinker's opinion on this point strikes a chord with Tarone (1976), Nemser (1971), and Sridhar (1980), who have tried to explore the causes of fossilization in language learner's interlanguage phonologies. There are two related questions here which have baffled second language acquisition researchers:

- 1. Is phonological fossilization inevitable for L2 learners?
- 2. What are the causes of such fossilization?

According to Scovel (1969), the answer to the first question is a resounding yes. He contends that adult language learners maintain a typical accent, which is indicative of their first language (L1). Scovel has named this the 'Joseph Conrad Phenomenon' after the prominent British author who achieved native-like fluency in English syntax (his L2) but retained a Polish accent (his L1). Scovel is so confident of his theory that he promises to offer a free dinner to anyone who can show him someone who learned a L2 after puberty and who speaks that L2 with perfect native-like pronunciation. No one has, hitherto, been able to produce such an individual to Scovel.

Some researchers do not go along with this idea. Hill (1970) maintains that phonological fossilization is by no means inevitable. Neufeld (1977) argues that there are methods that can enhance the teaching of pronunciation of a L2 and that can help adult language learners acquire native or near-native proficiency in pronunciation. However, the subjects of Hill and Neufeld have not been examined by L2 acquisition researchers to determine whether they really achieved native-like pronunciation in their respective second languages. It seems that the question of the inevitability of phonological fossilization in adults remains undecided.

The second question is complicated and requires serious attention. One possible explanation for the causes of phonological fossilization is the atrophy of the nerves and muscles necessary for articulation. This theory maintains that the nerves and muscles instrumental in pronouncing second language pronunciation patterns have atrophied so

that native-like pronunciation is almost impossible. This notion, however, has not been proven empirically.

Another psychological explanation comes from Lenneberg (1967) who suggests that after puberty, it is difficult to master the pronunciation of a L2 because a critical period in brain maturation has been passed and "…language development tends to freeze." He calls this phenomenon "lateralization" – the completion of cerebral dominance. According to him, lateralization impedes the learning of the phonology of a L2 more than the learning of the syntax or vocabulary of a L2.

Lenneberg's views find support in a recent neurolinguistic study, which was conducted at the Slaon-Kettering Cancer Center. Kim, Relkin, Lee, and Hirsch (1997) contend that after puberty the human brain allocates a separate cortical area for second languages. They argue that native languages and second languages are represented in separate cortical areas in a human brain, which is why adult language learners never achieve native-like proficiency in their second language. On the contrary, they claim that when both native and second languages are acquired before puberty (early bilingual children), the two languages are represented in common frontal cortical areas. Based on the findings of their study, they conclude that there are language-specific regions in Broca's area. However, the results of their study are inconclusive, and their evidence is indirect.

Contrary to Lenneberg, Flynn and Manuel (1991) argue that the effects of agedependent variables on the language acquisition process and the universal properties shared by language learners are not known clearly. They argue that lateralization does not increase by age, and it is hard to reconcile the fact that plasticity is the determining factor in language acquisition and that the brain becomes less functional with age. Discussing modularity and categorical perception, Flynn and Manuel (1991) note that perceiving and discriminating between speech sounds is a specialized behavior. They claim that adult L2 learners don't lose their ability to perceive speech sounds, but they have difficulty with certain perceptual distinctions. To acquire new speech sounds, L2 learners need feedback which need not be auditory, they suggest. Finally, they point out that the critical period hypothesis is less convincing because it doesn't account for successful second language learners. It should be noted that they studied speech perception in a L2. Speech perception and speech production are quite independent skills, and should be teased apart in trying to unravel the puzzle of phonological fossilization (Archibald, 1992). As stated previously, this study is concerned with L2 productive phonology and, therefore, will focus on the articulatory aspects of phonology.

A somewhat different position has been taken by Krashen (1977) who opposes Lenneberg. He maintains that adolescents consciously construct abstract theories about the world during the course of their cognitive development. They tend to learn the L2 by abstracting grammar and pronunciation rules and applying them. It is obvious that this theory considers L2 acquisition the same as learning a L1. Krashen calls this process 'creative construction' and argues that the close of the critical period is related to Piaget's (1972) stage of formal operations. In another study, Krashen and Harshman (1972) reanalyzed Lenneberg's data and came to a conclusion contradicting his finding. They argue that lateralization takes place long before the end of the critical period for language learning. However, Tarone (1978) does not agree with Krashen and Harshman and asks why formal operations should affect only the pronunciation and not the syntax or

morphology. This indeed puts a question mark on the formal operation type of psychological explanation for phonological fossilization.

Another psychological explanation is related to the issue of language transfer. Theoreticians claim that transfer has its strongest effect on the pronunciation of a L2 (Broselow, 1987). Refuting this claim, Neufeld (1977) reports on a study in which he used a new technique to enhance teaching second language pronunciation to adults. Instead of linking language transfer with L2 productive phonology, he says that adult learners tend to form inaccurate acoustic images of the target language sound patterns, attributing this to inappropriate learning situations. These acoustic images get set once they are formed. This leads to the fixation of the learner's pronunciation patterns. He maintains that the learner's ability to perceive and articulate a new sound could result from his or her psychological inability to alter the criteria used to categorize speech sounds. It is, however, not clear from his discussion why adults are affected by acoustic images and children are not.

A third type of explanation is radically different from psychological habit formation and uses arguments related to affective factors to prove that interlanguage pronunciation is a sensitive indicator of adult learners' lack of empathy with the native speakers and culture of the L2. Unlike children, who are generally more compatible to L2 culture, adults have more rigid language ego boundaries. They may be inclined to establishing their cultural and ethnic identity and this they do by maintaining their stereotypical accent (Guiora et al. 1972).

According to Guiora et al. (1972), adults do not have the motivation to change their accent and to acquire native-like pronunciation. These researchers attempted to

mitigate the empathy level of their subjects by administering increasing amounts of alcohol. They found that the learners' pronunciation of the target language sounds improved to a certain point and then decreased as they drank increasing amounts of alcohol. However, a different explanation could be that subjects were under the influence of alcohol and had less difficulty in articulating the target language sounds because of muscle-relaxation.

That socio-emotional factors are powerful in determining degree of proficiency in pronunciation cannot be denied. It should be noted though that these factors are hard to determine in an experimental setting. Nevertheless, the findings of Guiora et al. (1972) may have some feasible implications for the use of socio-emotional factors in enhancing the learning process.

At this point, we don't have a clear understanding of what causes phonological fossilization. It is obvious that none of the above discussed explanations provides deep insights into this debatable phenomenon. There is persuasive evidence that supports the existence of different processes and constraints that cause phonological fossilization. It is not clear, however, whether it is influenced and determined by inadequate phonetic input, by lack of motiation to acquire the L2 sounds, by gradual deterioration of some basic speech learning mechanisms, or by inability to keep the L1 and L2 phonological systems from interacting with one another (language transfer).

One question that is pertinent to these issues is whether adult language learners can produce the L2 sounds just like native speakers of the target L2. The present study will examine the production of English /l/ and /r/ by native speakers of Japanese, since these are problematic sounds for them to pronounce. Japanese speakers of English often

identify English liquids /l/ and /r/ with Japanese liquid /r/, and, as a result, approximate and substitute the target L2 sounds with Japanese /r/. The process is called interlingual identification (Selinker, 1995), and is triggered when the perceptually similar L2 and L1 sounds differ acoustically and auditorily. What is interesting is that this identification can extend from a perceptual level to a productive level (Lehiste, 1988; Flege, 1988; Flege, J., et al., 1995b). The purpose of the present study is to determine whether with informed practice, Japanese speakers of English would be able to improve their production of English /l/ and /r/ and, thus, transcend the process of interlingual identification.

III. Justification for examining this area

While much work has been done in studying the acquisition of morphology and syntax, there is one area of second language acquisition that has been largely overlooked by researchers. While summarizing existing second language research, Schumann (1976) found absolutely no studies on second language phonology. The reason for the dearth of studies in the field of L2 phonology is the common belief that the learner's phonological system does not provide useful insights into the nature of the second language acquisition process. To a large extent, this notion was based on the wrong assumption that all phonological errors were the result of direct transfer of the native language phonology to the interlanguage system in some uninteresting ways (Tarone, 1978). That is to say, the pronunciation of a second language was not significant for the field of second language research.

This conviction is still prevalent among second language acquisition researchers, second language teachers, and second language students. As Jusczyk (1997) rightly points out, there are two reasons for this contention: a) Little is known about the

development of speech perception and speech production; and b) Research on phonology (perception and production) "makes relatively little contact with the rest of the research on language acquisition" (p.1). In their study on teaching second language pronunciation, Krashen and Terrell (1983) concluded "...we do not place undue emphasis in early stages on perfection in the students' pronunciation, but rather concentrate on providing a good model with large quantities of comprehensible input before production is attempted" (p.89-91). This is perhaps why those who put a great deal of emphasis on fluency in second language acquisition (the proponents of the proficiency movement) deemphasize teaching pronunciation in the classroom (Omaggio, 1986). After conducting a survey on various teaching methodologies that focused on communication, Terrell (1989) also confirmed that "Communicative approaches likewise have not known what to do with pronunciation" (p. 197).

The best explanation of why methodologists have ignored the teaching of pronunciation in second language classrooms comes from Hammond (1995) who attributes their lack of interest to three prinicipal reasons:

- 1. The teaching of pronunciation appeals only to learning and not to acquisition, and is therefore of no value in a system that is attempting to get students to acquire language.
- 2. The constant reference to correct pronunciation or to the correction of student pronunciation errors will inhibit students from speaking by raising their affective filters.
- 3. Since most second language instruction in the United States involves learners who have passed the so-called ideal age for language acquisition, these methodologists believe that adult students have already lost much of their innate capacity to acquire a nativelike pronunciation in a second language (p. 294).

Hammond (1995) goes on to argue that it would be misleading to presume that language learners only need to acquire the grammar system and vocabulary of a second language. It is equally essential that they acquire the rules of the second language phonology in

order to be intelligible to other speakers of that language. He notes that it is crucially important to examine second language pronunciation acquisition because:

- 1. There is a relatively large body of phonetic research that shows adult language learners are capable of perceiving, imitating, and learning fairly subtle and precise phonetic distinctions present in target languages.
- 2. Phonologists have demonstrated that the acquisition of second language phonology is governed by universal properties of phonology.
- 3. We need to determine the significance of phonetic and phonological research...for the acquisition of pronunciation in a second language.
- 4. We need to discover how this information can be incorporated into the theoretical framework of communicative teaching methodologies and into the actual classroom situation (p. 295).

Hammond's views on assessing the significance of second language acquisition in general and second language pronunciation acquisition in particular find support in Sharwood Smith (1995). Although Sharwood Smith (1995) does not discuss teaching second language pronunciation, his ideas comform to Hammond's argument that it is important to examine second language acquisition for pedagogical purposes. Sharwood Smith notes:

"Language learning is somehow different from other kinds of learning in that practice and explanation are not straightforwardly helpful and may sometimes be quite useless. Therefore, research must continue to experiment with different aspects of the language system to find out which technique works with which particular areas of the L2 system and why" (p.1).

Several other researchers stress that "further research is needed to establish if there are, after all, special ways of sensitizing the learners to the target norms in such a way as to affect their own spontaneous performance in the language" (White, 1991; Trahey and White, 1993; Trahey, 1996). For all of these reasons, it seems reasonable to test the hypothesis of this study and determine whether the proposed technique enables the learners to pronounce target sounds with relative ease and speed.

IV. Methodology

Subjects

Twenty eight female Japanese speakers, studying English as a Second Language in the United States, will be chosen for this study. The subjects will be divided into two groups: control and experimental.

Data Collection/Analysis Procedures

Elicited Speech

Word Level

The target sounds being examined will be given in citation forms (words). The subjects will be asked to read aloud a list of fifty words, containing English /l/ and /r/ in word initial, word medial, and word final position (see Appendix A). The reason for doing this comes from the fact that even though learners sometimes approximate the phonemes in isolation, they still have trouble pronouncing them in different word positions, mainly because of the sounds preceding and following them. The purpose of having subjects pronounce English /l/ and /r/ in different word positions is to determine whether the subjects have mastered these sounds in different phonological environments. Most of these words will be occurring in minimal pairs because Labov (1972) argues that "in minimal pairs such as dock and dark, guard and God, source and sauce, bared and bad, /r/ is the sole differentiating element, and it therefore receives maximum attention" (p. 85).

Sentence Level

There is evidence in first language acquisition research that sentence repetition tasks result in better performance than spontaneous speech (Dickerson, 1974). The effect

of sentence repetition versus spontaneous discourse on the phonology of L2 users is unknown. However, in order to obtain a sufficient data sample, a sample that is consistent across subjects, sentence production, along with citation forms, is selected for this study. Johansson's (1973) use of target language sounds at the sentence level is a significant improvement over previous experimental studies, because they only focussed on production at either word level or spontaneous speech. Keeping this in mind, the subjects' task will be to read aloud a list of sentences (see Appendix B), which will also have the target sounds in word-initial, word-medial, and word-final positions. The difference being that this time the level of attention will be lessened because instead of pronouncing words in citation forms, the subjects will be reading whole sentences.

Connected Speech

In addition, a sample of connected discourse will be elicited from each subject. The natural speech of each speaker, speaking English, will be taped on an audiocassette as they answer the investigator's questions. These questions will be related to the subjects' educational background, work, personal interests, and academic goals, etc. Prompting will be kept at a minimum.

Collecting a sample of connected speech is important in that words in spoken language are not separated from each other. Rather, they take on the feature of the initial sound in the adjacent word or get overlapped by the final sound in the preceding word. Liberman et al (1967) calls this phonological feature coarticulation. Jusczyk (1997) notes that with increasing speaking rates, coarticulation can occur "between successive segments within words, but as speaking rates increase, the likelihood of coarticulation across word boundaries also increases" (p. 5). It is reasonable to assume that the degree

of difficulty in pronouncing the target sounds in different word positions may increase as the subjects' rate of speaking increases.

Speech Perception

The subjects (both control and experimental) will be given a speech perception test before, after, and one month after the training, in which they will listen to sentences, containing /l/ and /r/ in different word positions (see Appendix C). The target sounds will be omitted from these words. After listening to the sentences, the subjects will fill in the blanks with the missing sound. Since contextual clues can help them in interpretation, words occurring in minimal pairs, such as *correct* and *collect*, will be placed in the same sentence in a way that is logical with the only difference being the word itself. However, they will be randomly distributed so that there will be no particular order in which they occur. Also, to make the task of perceiving the target sounds correctly more difficult, there will be some nonsense words containing /n/. This particular sound was chosen because it is articulated in the alveolar area, making it phonetically almost similar, in terms of articulation, to /l/.

The purpose of this test is to determine whether speech production has an impact on speech perception or vice versa. Archibald (1992) believes that speech perception and speech production are two relatively independent skills and should be teased apart to examine L2 phonology. However, Flynn and Manuel (1991) note that perceiving and discriminating between speech sounds is a specialized behavior. They claim that adult L2 learners don't lose their ability to perceive speech sounds, but they have difficulty with certain perceptual distinctions. It would be interesting to see if the subjects in the

experimental group will be able to obviate the difficulty in making perceptual distinctions with an improved ability to produce L2 sounds.

Training

The experimental group will spend 1 hour practicing the target sounds in words and sentences twice a week for 8 weeks (see Appendix D). They will be shown two diagrams, one for each sound. The investigator will explain the organs of speech and manner of articulation. Technical details such as liquid and retroflex will not be discussed to preclude complexity and misunderstanding. During each training session, the investigator will not model the target sounds because speech perception and speech production are relatively independent skills and should be dealt with separately in order to unravel the puzzle of phonological fossilization (Archibald, 1993a; 1993b). It should be noted that speech perception involves acoustic phonetics whereas speech production involves physiological bases of speech. This study is concerned with L2 productive phonology and, therefore, will focus on the articulatory aspects of phonology.

In addition to the diagrams, the subjects will be given oral and written instructions for each sound, such as 'place the tip of your tongue against your upper gum ridge,' 'raise the tip of your tongue towards the upper gum ridge but do not touch it,' etc.

The control subjects will not receive the special training. They will be orally tested along with the experimental subjects. However, to determine the effectiveness of the visual instruction compared to other conventional methods of teaching pronunciation, such as oral drills, listening and repeating exercises, etc., the subjects in the control group will also spend 2 hours repeating pairs of words and sentences, containing English /l/ and /r/ in various word positions, after an instructor (a native English speaker) on an

audiocassette (see Appendix E). The frequency and length of this exercise will be the same as the training period, i.e., 2 sessions of 1 hour per week for 8 weeks. The control group's output will not be prompted by the researcher. In other words, the target sounds will not be modeled, prompted, and modified by the researcher; the control group will only listen to the instructor on the tape and repeat after him/her without any intervention. Every week the subjects in the control group and the experimental group will be given the same material to practice their pronunciation (see Appendix F).

Before, after, and one month after the completion of the training, both the control group and the experimental group's production of the target sounds will be recorded on audiocassettes. A panel of 10 judges will test the subjects' production of the target sounds /l/ and /r/ by listening to the audiocassette and ranking them on a 7-point scale from /l/ to /r/. The errors, which allow minimal intelligibility but fall short of native-like production, will be ranked in between. These scores will be obtained by averaging over responses obtained for each subject. An overall mean will be computed for laterals /l/ and retroflex /r/ spoken by all 28 subjects.

References

- ARCHIBALD, J. 1992. Transfer of L1 parameter settings: some empirical evidence from Polish metrics. *Canadian Journal of Linguistics* 37, 301-39.
- _____ 1993a: Language learnability and L2 phonology: the acquisition of metrical parameters. Dordrecht: Kluwer.
- _____1993b: The learnability of English metrical parameters by adult Spanish speakers. *International Review of Applied Linguistics* 31, 129-42.
- BONGAERTS, T., PLANKEN, B., and SCHILS, E. (1992) Can late starters attain a native accent in a foreign language? A test of the critical period hypothesis. In (eds.) *The Age Factor in Second Language Acquisition*.
- BROSELOW, E. (1987). An investigation of transfer in second language phonology. In R. Scarcella & M. Long (Eds.) *Issues in Second Language Research*. Cambridge, MA: Newbury House Publishers.
- COOK, V. (1991). Second Language Learning and Language Teaching. London: Edward Arnold.
- DICKERSON, L. (1974). *Internal and external patterning of phonological* variability in the speech of Japanese learners of English, Ph.D. dissertation, University of Illinois.
- ELLIS, R. (1994). *The Study of Second Language Acquisition*. Oxford: Oxford University Press.
- EKSTRAND, L. (1978). English without a book revisited: The effect of age on second language acquisition in a formal setting. *Didakometry 60*, Department of Educational and Psychological Research, School of Education, Malmo. Reprinted in KRASHEN, SCARCELLA, and LONG (eds.) (1982) (pp.136-58).
- ERVIN-TRIPP, S. (1974). Is second language learning like the first? *TESOL Quarterly* 8, 111-27.
- FLEGE, J. (1988). The production of "new" and "similar" phones in a foreign language. In H. Winitz (Ed.) *Human communication and its disorders: A review, 1988.* Norwood, NJ: Ablex.
- FLEGE, J., & FLETCHER, K. (1992). Talker and listener effects on the perception of degree of foreign accent. *Journal of the Acoustical Society of America*, 91
- FLEGE, J., MUNRO, M., & MACKAY, I. (1995a). The effect of age of second language learning on the production of English consonants. *Speech Communication*, 16.
- FLEGE, J., et. al. (1995b). Factors affecting strength of perceived foreign accent in a second language. *Journal of the Acoustical Society of America*, 97.
- FLYNN, S., & MANUEL, S. (1991). Age-dependent effects in language acquisition: An evaluation of "Critical Period" Hypotheses. In Eubank, L. (Ed.). *Point Counterpoint: Universal Grammar in the Second Language*. Philadelphia: John Benjamins Publishing Company.
- GUIORA, A. Z., et. al. (1972). The effects of experimentally induced changes in ego status on pronunciation ability in a second language: an explanatory study. *Comprehensive Psychiatry*, 13.

- HAMMOND, R. (1995). Foreign accent and phonetic interference: The application of linguistic research to the teaching of second language pronunciation. In Eckman, Highland, Lee, Mileham, and Weber (eds.) *Second Language Acquisition Theory and Pedagogy*. 1995. NJ: Lawrence Erlbaum Associates Publishers.
- HARLEY, B. (1986). *Age in Second Language Acquisition*. Clevedon: Multilingual Matters.
- HILL, J. (1970). Foreign accents, language acquisition and cerebral dominance revisited. *Language Learning*, 20.
- JUSCYZK, P. (1997). The Discovery of Spoken Language. MA: MIT Press.
- JOHANSSON, F. (1973). Immigrant Swedish phonology: A study in Multiple Contact Analysis. *Lund*, Sweden: CWK Gleerup.
- KIM, K, RELKIN, N., LEE, K., and HIRSCH, J. (1997). Distinct cortical areas associated with native and second languages. *Nature*, Vol. 388, July 10: 1997.
- KRASHEN, S., & HARSHMAN, R. (1972). Lateralization and the critical period. *Working papers in phonetics (UCLA), 23*.
- KRASHEN, S. (1977). Lateralization, language learning and the critical period: Some new evidence. *Language Learning*, 20.
- KRASHEN, S., LONG, M., and SCARCELLA, R. (1979). Age, rate and eventual attainment in second language acquisition. TESOL Quarterly 13, 573-82. Reprinted in KRASHEN, SCARCELLA and LONG (eds.) (1982) (pp. 161-72).
- KRASHEN, S., and Terrell, T. (1983). *The Natural Approach*. Hayward, CA: Alemany. LABOV, W. (1972). *Sociolinguistic Patterns*. Philadelphia: University of Pennsylvania Press.
- LEHISTE, I. (1988). Lectures on language contact. Cambridge, MA: MIT Press.
- LENNEBERG, E. (1967). Biological foundations of language. New York: Wiley.
- LIBERMAN, A., COOPER, F., SHANKWEILER, D., and STUDDERT-KENNEDY. (1967). Perception of the speech code. *Psychological Review* 74, 431-461.
- LONG, M. (1990). Maturational constraints on language development. Studies in Second Language Acquisition, 12: 251-85.
- MEHLER, J., DOMMERGUES, J., FRAVENFELDER, U., & SEGNI, J. (1981). The syllable's role in speech segmentation. *Journal of Verbal Learning and Verbal Behavior*, 20.
- NEMSER, W. (1971). Approximative systems of foreign language learners. *IRAL*, 9. NEUFELD, G. (1977). Language learning ability in adults: a study on the acquisition of prosodic and articulatory features. *Working Papers in Bilingualism*, 12.
- OLSON, L. and SAMUELS, S. (1973). The relationship between age and accuracy of foreign language pronunciation. *Journal of Educational Research* 66, 263-67. Reprinted in KRASHEN, SCARCELLA, and LONG (eds.) (1982) (pp.67-75).
- OMAGGIO, A. (1986). *Teaching Language in Context: Proficiency Oriented Instruction*. Boston: Heinle & Heinle.
- OYAMA, S. (1976). The sensitive period for the acquisition of a nonnative phonological system. *Journal of Psycholinguistic Research*, 5.
- SCHUMANN, J. (1976). Second language acquisition research: Getting a more global look at the learner. In Brown, H. (ed.), Papers in Second Language Acquisition, *Language Learning*, MI: Ann Arbor.

- SCOVEL, T. (1969). Foreign accents, language acquisition, and cerebral dominance. *Language Learning*, 19.
- _____(1988). A Time to speak: A psycholinguistic inquiry into the critical period for human speech. New York: Newbury House/Harper & Row.
- SELINKER, L. (1972). Interlanguage. IRAL, 10.
- . (1995) *Rediscovering Interlanguage*. London: Longman.
- SINGLETON, D. (1989). *Language Acquisition: The Age Factor*. Clevedon: Multilingual Matters.
- . (1992a). Second language instruction: The when and the how. *AILA Review* 9, 46-54.
- SHARWOOD SMITH, M. (1995). *Input enhancement and the logic of input processing*. Paper presented To EUROSLA 6, Nijmegen, June, 1995.
- SNOW, C. and HOEFNAGEL-HOHLE, M. (1978a). Age differences in second language Acquisition. In G. Nickel (ed.) Applied Linguistics. Psycholinguistics (pp.293-309). Stuttgart: Hochschulverlag.
- _____. (1978b). The critical period for language acquisition: Evidence from second language learning. Child Development 49, 1114-28. Reprinted in KRASHEN, SCARCELLA, and LONG (eds.) (1982) (pp.93-111).
- SRIDHAR, S. N. (1980). Contrastive analysis, error analysis, and interlangauge. In Croft, K. (Ed.), 1980. Readings on English as a Second Language. Cambridge, Mass: Winthrop.
- TARONE, E. (1976). Some influences on interlanguage phonology. *IRAL and working papers in bilingualism, 8*.
- TARONE, E. (1978). The phonology of interlanguage. In J.C. Richards (Ed.), Understanding second and foreign language learning: Issues and approaches. Rowley, MA: Newbury House Publishers.
- TERRELL, T. (1989). Teaching Spanish Pronunciation in a Communicative Approach. *American Spanish Pronunciation-Theoretical and Applied Perspectives*, ed. by P. Bjarkman and R. Hammond. Washington, DC: Georgetown University Press.
- TRAHEY, M. (1992). Positive evidence, pre-emption and parameter resetting in second language acquisition. Unpublished master's thesis, McGill University; Montreal.
- TRAHEY, M. and WHITE, L. (1993). Positive evidence and preemption in the second language classroom. Studies in Second Language Acquisition. Vol. 15 No. 2 (pp.181-204) Cambridge University Press.
- WHITE, L. (1991). Second language competence versus second language performance. In Eubank, L. (Ed.). *Point Counterpoint: Universal Grammar in the Second Language. Philadelphia: John Benjamins Publishing Company.*
- YOUNG-SCHOLTEN, M. (1995). The negative effects of 'positive' evidence on L2 phonology. In L. Eubank, L. Selinker, & M. Sharwood Smith (Eds.). *The Current State of Interlanguage: Studies in Honor of William E. Rutherford*. Philadelphia: John Benjamins Publishing Company.

APPENDIX A

Word Level Production Test

Read down the following list of words aloud. Remember to pronounce each word as clearly as you can.

- 1. lamp
- 2. correct
- 3. steel
- 4. pray
- 5. holding
- 6. browse
- 7. wrong
- 8. alive
- 9. erect
- 10. clue
- 11. appeal
- 12. four
- 13. elect
- 14. stall
- 15. ramp
- 16. believe
- 17. hoarding
- 18. locket
- 19. fall
- 20. melee
- 21. frock
- 22. bowling
- 23. fole
- 24. rocket
- 25. collect
- 26. steer
- 27. flock
- 28. mole
- 29. arrive
- 30. blouse
- 31. appear
- 32. belly
- 33. grow
- 34. far
- 35. light
- 36. coal
- 37. merry
- 38. play
- 39. boring
- 40. crew

- 41. star
- 42. glow 43. bereave 44. core
- 45. long 46. car
- 47. berry 48. right 49. call

- 50. more

APPENDIX B

Sentence Level Production Test

Read each of the following sentences aloud. Remember to pronounce each word as clearly as you can.

- 1. Have you seen my locket?
- 2. Did you correct the papers?
- 3. This is going to glow.
- 4. We all really like praise.
- 5. My berry aches.
- 6. It was very long.
- 7. Why don't you believe me?
- 8. Have you seen my rocket?
- 9. They erected this building.
- 10. Please make him alive.
- 11. My belly aches.
- 12. Could you please give me the foal?
- 13. Why did your brother steer?
- 14. Please take a look at the coal.
- 15. Do you want some more?
- 16. Move toward the right.
- 17. Why don't you bereave me?
- 18. They elected this building.
- 19. Why did your brother steal?
- 20. Do you want some mole?

- 21. Did you collect the papers?
- 22. We all really like plays.
- 23. It was very wrong.
- 24. Move toward the light.
- 25. This is going to grow.
- 26. Could you please give me the four?
- 27. Why didn't he appeal?
- 28. Please take a look at the core.
- 29. Why didn't he appear?
- 30. Please make him arrive.

APPENDIX C

Perception Test	Name:
Listen to the following sentences carefully. For each quest containing a word that has a single sound missing in the questill in what you hear. Keep in mind that the sentences will listen attentively. Example: You hear: John was wearing a cross. You read: John was wearing a c_oss. You fill in: r	uestion. Listen carefully, and
Now answer the questions.	
1. Have you seen myocket?	
2. Did you coect the papers?	
3. Do you want some moa?	
4. This is going to gow.	
5. We all really like paise.	
6. My bey aches.	
7. It was veryong.	
8. Why don't you beieve me?	
9. Have you seen myocket?	
10. They eected this building.	
11. Please make him aive.	
12. My bey aches.	
13. Could you please give me the foa?	
14. Why did you brother stee?	
15. Please take a look at the coe.	
16. Have you seen myocket?	

17. Do you want some mo___e?

18. Move toward theight.
19. Why don't you beeave me?
20. They eected this building.
21. My bey aches.
22. Why did your brother stea?
23. Why didn't he appea?
24. Please make him aive.
25. Do you want some moe?
26. Could you please give me the foa?
27. Please take a look at the coe.
28. This is going to gow.
29. Did you coect the papers?
30. We all really like pays.
31. They eected this building.
32. It was veryong.
33. Move toward theight.
34. It was veryong.
35. This is going to gow.
36. Did you coect the papers?
37. Move toward theight.
38. We all really like pays.
39. Could you please give me the fou?
40. Why didn't he appea?

- 41. Why did your brother stee____?
- 42. Please take a look at the co____e?
- 43. Why didn't he appea____?
- 44. Please make him a____ive.
- 45. Why don't you be ___eave me?

APPENDIX D Training Session Group A

Repeat the following words carefully after the instructor on the tape. Make sure you pronounce each word as clearly as possible.

Let	long	leg	light	live	leave	late	listen	last	little
Only	collect	alive	family	hello	yellow	salad	believe	alone	balloon
All	able	tell	apple	fill	table	call	people	fool	trouble
Red	run	row	read	rest	rich	rain	real	wrong	write
Very	marry	story	berry	sorry	hurry	carrot	orange	around	tomorrow
Or	are	far	door	near	more	sure	their	before	appear

Repeat the following phrases and sentences carefully after the instructor on the tape.

- 1. Where are you?
- 2. Near or far.
- 3. Are you sure?
- 4. See you tomorrow.
- 5. I'm very sorry.
- 6. He'll be right there.
- 7. Roy returns tomorrow morning.
- 8. The train arrives every hour.
- 9. I already read that short story.
- 10. Rose is wearing a red dress.
- 11. Robert ran around the corner.
- 12. Rita and Larry are married.
- 13. Remember, never put the cart before the horse!
- 14. Mark couldn't start the car.
- 15. I rented a four-room apartment.

Repeat the following pairs of words and sentences carefully after the instructor on the tape.

1.	late	rate
2.	led	red
3.	low	row
4.	elect	erect
5.	believe	bereave

6. Move toward the light.

Move toward the right.

7. Can you collect the papers?

Can you correct the papers?

8. Is there a lack of lamb?

Is there a rack of lamb?

9. It was very long.

It was very wrong.

10. Please remove the lock.

Please remove the rock.

11. Carry that load down the road.

12. We saw a palace in Paris.

13. I left the rake near the lake.

14. He lied about the long ride.

15. Jerry likes jelly and bread.

APPENDIX E Training Session Group B

Practice the sound /l/ as in 'like', then practice the sound in words. Pay special attention to the manner of articulation. Look at the diagram carefully as you produce the sound.

T	1
Law	leg

Look lunch

Laugh loud

college alarm

Believe bullet

Balance telephone

School kill

Female dial

Pool heel

Each of the following sentences contains the sound /l/ as in 'like'. Practice the sound in these sentences.

- 1. Bill, Phil, Lillian, and Lucy met for lunch at eleven o' clock.
- 2. Phil told Lillian she looked beautiful.
- 3. Lillian told Phil he was wonderful.
- 4. Lucy told Bill he looked old.
- 5. Bill told Lucy she was a spoiled child.
- 6. Lillian had a salad and lemonade for lunch.
- 7. Phil and Bill had fillet of sole and melon for lunch.
- 8. Lucy had leg of lamb and yellow jello for lunch.
- 9. Lucy spilled her yellow jello on Bill's lap.
- 10. Bill and Lucy no longer lunch together.

Training Session Group B

Practice the sound /r/ as in 'red', then practice the sound in words. Pay special attention to the manner of articulation. Look at the diagram carefully as you produce the sound.

Red write Rate ready Ring rug Carry parade Period direction Various foreign Before empire Ignore insure Guitar scar

Each of the following sentences contains the sound /r/ as in 'red'. Practice the sound in these sentences.

- 1. Sorry, I gave you the wrong directions.
- 2. Ronald ran around the corner.
- 3. Would you rather have rice with the roast?
- 4. When in Rome, do as the Romans do.
- 5. Was Ruth in a hurry to marry?
- 6. Didn't you realize it was raining when you ran out?
- 7. Don't worry, my camera is very good.
- 8. They had a terrible quarrel about the red roses.
- 9. Please show me the correct way to operate the microphone.
- 10. They carried all the chairs into the room before it started to rain.

APPENDIX F Practice Session 1

- 1. The lady in red looks gorgeous.
- 2. Barry runs half an hour every day.
- 3. Julia likes roaming around.
- 4. Ron and Larry are always late.
- 5. Christine likes to buy lots of chocolates.
- 6. Jerry Garcia was a great guitarist.
- 7. Could you please pass me the jar of lemons?
- 8. People are resting after a long week of crazy work.
- 9. She rested her elbows on the table.
- 10. Rest the ladder against the wall.
- 11. This tree is growing very fast.
- 12. The bell rings at eleven thirty.
- 13. Look, it's raining heavily.
- 14. Please don't look at me like I am from another planet.
- 15. Why don't you apply for a low-interest loan?

Practice Session 2

- 1. The plane will land shortly.
- 2. Bill, Phil, and Larry are raking up leaves fallen on the sidewalk.
- 3. Ronald rakes in a big salary on the cars that he sells.
- 4. The press raked up an old scandal about the new candidate for mayor.
- 5. Linda rallied her salespeople by giving them a powerful speech.
- 6. Doctors were afraid that child wouldn't live, but he rallied and lived.
- 7. When the woman was sick, all of her relatives rallied around her to cheer her up and make her well again.
- 8. She didn't want to fire some of her workers, but her boss rammed the order to fire them down her throat.
- 9. We rambled through the countryside on our bicycles.
- 10. Her rambunctious little boy is always chasing other children.
- 11. The annual rainfall in the desert is only two inches.
- 12. When it rains, it pours.
- 13. A rainbow with its red, blue, and yellow color is a pretty sight.
- 14. Last night's rainfall should help the flowers to grow.
- 15. She wears a gold locket from her boyfriend.
- 16. When the lock on our front door broke, we called a locksmith to fix it.
- 17. The location of the capital is in the center of the state.
- 18. We sat in the lobby until we were led to an office by a secretary.
- 19. She is a loafer who works as little as she can.
- 20. She's a lively young girl, always laughing and playing with her friends.

Practice Session 3

- 1. Larry uses a riding lawn mower to cut his large yard.
- 2. I depend on my lawyer for her sharp mind and knowledge of law.
- 3. This soap has a lovely smell of lavender.
- 4. Labor Day is the last big holiday of summer.
- 5. Linda has a tablecloth made of beautiful lace for her dining room table.
- 6. The villagers lacked food and medicine during the war.
- 7. There has been no rain, and the lack of it has ruined the crops.
- 8. That beautiful tray was painted with black lacquer.
- 9. Female mammals lactate and nurse their young.
- 10. A carpenter climbed a ladder to fix the roof.
- 11. People say that when a ladybug lands on you, it brings good luck.
- 12. The employees liked their boss's laid-back style of management.
- 13. Liz also wears a gray coat made of lambskin.
- 14. Her friends lamented the death of the dear old lady.
- 15. The writer portrays Americans after the war as happy and rich.
- 16. Rabbits are good jumpers and can run very quickly.
- 17. The students who are studying Hebrew call their teacher rabbi.
- 18. Julia's radiator warms her room in winter.
- 19. Roger puts raisins on his cereal for breakfast.
- 20. Basketball players look tall and rangy.

Practice Session 4

- 1. Rachel took her daughter to the doctor because she broke out in a rash.
- 2. Rats look like mice, but are larger.
- 3. The famous movie star made a rare public appearance.
- 4. My father likes rare meat that is still a little pink inside.
- 5. The rate of interest on a car loan is 10 percent.
- 6. Poor Bill is mentally ill and raves for hours.
- 7. Linda looks ravishing when she is all dressed up in beautiful clothes.
- 8. A football player did some razzle-dazzle with the ball and ran right around the other player.
- 9. The teacher reacted to Laurie's bad grades by giving her more homework.
- 10. Phil, Lance, Linda, and Julie are ready, willing, and able to sign the agreement now.
- 11. The grim reaper took the old man last night.
- 12. That couple left the neighborhood last year, then reappeared a year later.
- 13. Lee works very hard, so it is reasonable for him to ask for more money.
- 14. My father is not bald, but he has a receding hairline.
- 15. He fell in love with a new girlfriend on the rebound from a painful love affair that ended sadly.
- 16. The old church in the center of town is a historical landmark.
- 17. The landscape gardener planted a new lawn, trees, and flowers around our house.
- 18. Latchkey children learn to take care of themselves while their parents are at work.
- 19. The fellow stole a car and was arrested for grand larceny.
- 20. Tropical climates can make you feel languid.