

# **Listening Too Slowly? The Effect of Rate of Speech in Computer-Delivered Training Sessions for Listening Comprehension in English as a Foreign Language**

Doctoral Dissertation Grant

Topic: Technology (2004-5)

Applicant: Kara McBride

Second Language Acquisition and Teaching, University of Arizona

Advisor: Dr. Jun Liu

## **Statement of research issue and relationship to TIRF's current research priority**

Whether language learners should be spoken to at a naturally quick pace and with variations in pronunciation that are typical of all but careful speech, or whether learners should instead be given modified input that is more easily comprehensible to them is an issue that most language teachers feel comfortably able to answer: they know their students and they know if they need to modify their speech in order to assist their students in understanding. Furthermore, in a regular classroom setting, students are usually in a position to negotiate meaning and are thus able to cause modifications in conversations so that they match their communicative needs.

The situation is quite different with computer-delivered language lessons, in which often the student works independently, interacting not with a person but with a pre-programmed lesson that includes preselected language samples. Because language samples must be chosen ahead of time, the many variables upon which the samples may differ need to be carefully considered. This study proposes to look particularly at the effect of rate of speed on EFL learners' acquisition with respect to listening comprehension (LC). The study will vary the amount of control that the subjects will have in computer-delivered LC lessons in order to investigate whether that would have a beneficial impact on learning, as well as learners' experiences of these different features and how these enhance or discourage students' motivation and connection making.

## **Theoretical background**

This study has been designed to address the following five research questions:

1) How does the speed of delivered speech during an EFL learner's training affect acquisition? Do learners who hear faster speech process faster and slower speech better than learners who have been exposed mostly to slower speech?

2) Were learners who were allowed to pause listening passages during their training—compared to learners who were not allowed to do this during training—processing those training session passages better, and do they then show greater gains on measures of listening comprehension?

3) Between groups that demonstrate different speeds and/or accuracy of processing spoken language, do they also demonstrate different speeds and/or accuracy in forced (timed) syntactic processing of written language?

4) Are those FL learners who demonstrate greater comprehension of spoken language achieving this primarily through strategic listening, or is it instead more that their syntactic processing and lexical access function more automatically?

5) What kind of features do learners prefer in computer-delivered FL listening lessons and tests?

#### *Listening comprehension in second language acquisition*

Krashen's (1982) concept of *i+1* has been an important framework within SLA theory for viewing and reasoning about issues of matching classroom materials to students' level. If the input given to a learner is too simple—at the learner's level, *i*, or below—then there would be nothing to be learned from the input. If the input, on the other hand, is far too difficult for the learner to understand, then there would be no opening, as it were, through which the learner could enter the message and begin to analyze (or in some way process) the new material. Although the concept of *i+1* is intuitively appealing, it can be attacked on the grounds that it cannot be operationalized.

In order to comprehend spoken language, a number of abilities, both bottom-up and top-down, must work together in concert. Pragmatic, semantic, lexical and phonological knowledge are all needed to process spoken language. As language learners become more proficient, their processing speeds up. Evidence suggests that some processes, such as lexical access, must initially be controlled but can eventually become automatic in the language learner (Segalowitz & Segalowitz, 1989), while other processes that are automatic in native speakers and early bilinguals (i.e., those who acquired the second language at a very young age) never become fully automatic even in very advanced (but late) bilinguals (Nicol & Bell, 2004; Guillelmon & Grosjean, 2001).

It should not be assumed that the learner will capture and correctly decode everything being said in the input. Nor should it be assumed, for that matter, that native speakers do this. Listening comprehension, whether L1 or L2, always involves some level of piecing information together, and world knowledge and contextual cues play a large role in any person's understanding of spoken language (Rost, 2002). Within the field of SLA pedagogy, this kind of piecing together of information in listening comprehension is called strategy use. The role that these practices play in LC, and the teachability of these strategies through the enhancement of metacognitive awareness on the part of the L2 learner have a very important place in current L2 methodology (Flowerdew & Miller, 2005).

Some studies have found that a slower rate of speech significantly enhances foreign language learners' comprehension (e.g., Chaudron's 1988 review of ten studies; Griffiths, 1990; Zhao, 1997); other have found it significant only for very low levels of L2 proficiency (Blau, 1990); elsewhere, only a tendency but no significant difference was found (Rader, 1990). Zhao's (1997) study showed speed to be a significant factor in subjects' comprehension when the subjects themselves were able to determine how slow "slow" was. Subjects could choose between recordings at 100, 125, 150, 175 and 200% of the original numbers of words per minute. There was also a significant difference between LC scores between the previously mentioned condition in which subjects could choose the speed, and the condition in which subjects could not only choose the speed but also pause the recording whenever he/she so needed.

Advances in technology and in particular multimedia give language material developers many new options. Research can inform us as to which of these options serve to enhance language acquisition and improve assessment (Choi, Kim, & Boo, 2003; Dunkel, 1999; Feak & Salehzadeh, 2001; Fulcher, 2003; Gorsuch, 2004; Gruba, 1997; Jensen & Vinther, 2003; Chun, & Plass, 1997; Kenyon & Malabonga, 2001; Mayer, 2001; Merlet, 2000; Progosh, 1996; Roever, 2001; Shin, 1998; Secules, Herron, & Tomasello, 1992; Suenobu, Kanzaki, Yamane, & Young, 1986; Zhao, 1997).

## **Research methodology**

### *Subjects*

Subjects will be students at one of three college campuses in Talca, Chile. The majority of the students at these institutions and thus of those who will be part of this project could be described as being between beginner and intermediate level.

I am conducting the study at Talca because I worked there for three years and am familiar with their curriculum and proficiency levels. Also, I conducted a study on the campus in June and July of 2003. I have many contacts there and am able to get the cooperation and support of both the English and Computer Science Departments.

### *Tests*

At the beginning of the experiment, all subjects will be asked to answer an online survey about their knowledge of and history of studying English. As students sign on to the experiment, they will be randomly assigned to take one of the two versions of the pretest (to later take the other form as their posttest). I will use tests that I am currently developing because these tests target listening comprehension, which most language tests do not focus on, and my tests can provide separate scores for LC at fast (200 wpm) versus slow (135 wpm) rates of speech. Furthermore, I am able to target language samples to match the curriculum of the subjects' language program.

The tests will have three main types of task:

1) The subject listens to two listening passages delivered at 200 wpm, with ten multiple-choice comprehension questions each. Here as elsewhere throughout the experiment, only the listening passages are in English; the instructions and the questions are in Spanish, the native language of the subjects.

2) Same format as (1), except that the listening passages are delivered at 135 wpm.

3) The third task type uses 20 written sentence-construction ("maze") items (Nicol, Forster, & Veres, 1997). In this technique, the subject is shown a progressive series of word pairs and chooses the one that can continue a well-formed sentence. The item stops if the subject chooses the wrong item.

As subjects answer the LC questions and work through the maze items on line, their time-stamped responses will be automatically sent to a database.

Once the results are in from the pretest, I will assign each student to one of the four conditions (explained below). In creating the groups, I will want to have an equal number of low, middle and high scorers in each group, as well as to distribute people from the same classes into the different groups.

### *Training sessions*

The other ten sessions of the experiment (#2-#11) will be training sessions, also online. The training session lessons include multiple choice and open-ended questions, all of which will be sent to a database. All subjects in Group A will receive A-type lessons throughout the ten training sessions. Group B subjects will have only B-type lessons, and so on. The four conditions for the training period are the following:

A) The subjects hear the listening passages always at a relatively quick rate (200 wpm). They, like all subjects, hear each passage twice per lesson.

B) The subjects hear the listening passages always at a relatively slow rate (135 wpm).

C) The subjects hear the listening passage the first time at the quicker rate (200 wpm). For the second listening, they may choose whether to hear it again at the same speed or whether to listen to it the second time at the slower rate (135 wpm).

D) The subjects hear the listening passages always at the quicker rate (200 wpm), but during the second playback of the listening passage, they may pause the recording at any time, but they are not allowed to rewind or repeat. The pause button will only work while being clicked on.

All listening passages in this experiment will be based on scripts but will aim for a natural, conversational style, read by native U.S. speakers of English. The ten lessons develop a common storyline. There will be two actual recordings of each training session dialogue—one slower, one faster—so that the changes that naturally come with faster and slower speech (level of clarity of pronunciation, amount of pausing, etc.) are part of the recordings. However, to have recordings that are consistently at 135 and 200 wpm, a computer will stretch or compact the sound to the precise time necessary.

### *Surveys*

Subjects will be invited to answer a brief, online survey after every one of the ten training session lessons. These ask about their perception of the computer end of the lessons.

### *Interviews*

I will also seek 35 volunteers to agree to additional interviews and psycholinguistic testing after the posttest. The interviews are an opportunity to investigate the subjects' perception of their own processing of the listening passages and of the comprehension questions, as well as to investigate the subjects' use of strategies. The interviews will also be an opportunity to explore the subjects' point of view about what makes for good and useful computer-based material design.

### *Additional testing: Auditory moving window and grammaticality judgments*

General speed of comprehension can be tested by the auditory moving-window (AMW) technique (Ferreira, et al., 1996), in which the subject hears one part of a sentence at a time and pushes a button to hear each next phrase. The subject's comfort level in listening is reflected by the speed at which he/she advances through the sentence.

Speed of syntactic processing can be tested by playing sentences to the subject and asking him/her to quickly judge the grammaticality of what he/she has heard. The subject indicates his/her judgment by pushing a button after hearing the sentence. By using items that the subject should be able to judge correctly, relative speeds of judgment

can be measured in ms. If some items are spoken at a fast rate and others at a slow rate, it can be tested whether the subject requires additional time to process fast speech.

### **Statement of implications of research for theory, policy, and/or practice**

If it turns out that one speed or another appears to encourage FL listening comprehension development, then this will have implications for how teachers should attempt to speak in class, and it will inform the design of computer-delivered LC lessons. The number of subjects in this study should allow for a differentiation between what benefits this factor provide for learners at different proficiency levels.

If allowing learners to pause playbacks helps the learners' acquisition, then this skill should be taught to language learners, and this feature should be included in multimedia lessons.

Correlations found between learners' scores on the sentence-building/maze items and on the tests of global listening comprehension would suggest that maze items could be pursued as a possible technique in language testing. Secondly, it would suggest that maze items may prove to be a beneficial training technique. The technique could be used to teach learners quick syntactic processing without the additional burden of LC.

If on the other hand the answer to research question #3 is no, then this might indicate that LC depends very highly on acoustic decoding. On the other hand, it might mean that strategy use is of primary importance in good L2 listening comprehension. This study's interviews should indicate possible answers to these questions.

The fourth research question asks about the relationship between comprehension achieved through strategic means and that which comes about through automatic processing. This relates to the long-debated issues of what the difference between competence and performance is (Chomsky, 1957; Saussure, 1916); what communicative competence is (Bachman, 1990; Canale & Swain, 1980; Gumperz & Hymes, 1972); and to what extent L2 is like L1 learning (Bley-Vroman, 1988). Although this study will not be able to reach definitive answers to this question, results showing patterns of differences between different training groups or different levels of proficiency would be informative and could suggest what direction of research could prove fertile in the future.

The last research question is an exploratory one and may lead to useful insights that could inform materials design for computer-delivered L2 lessons. It is not uncommon for subjects to suggest innovative improvements to testing formats when they are interviewed about their responses to tests (see for example Dunkel, 1991 and Gorsuch, 2004).

### **Explanation of the role and expertise of all research partners and consultants**

The chair of my committee, Dr. Jun Liu, is an expert in classroom-oriented SLA, methodology in research and teaching, curriculum development and teacher education. He has been able to guide me in lesson format, testing, and research design. Dr. Wildner-Bassett specializes in foreign language pedagogy, language acquisition, interlanguage pragmatics, and nonlinear dynamic systems in L2 learning and teaching. She has advised me especially in terms of pragmatic and social considerations in my study. Doctors Janet Nicol and Ken Forster are both in psycholinguistics and have helped me with the psycholinguistics side of my study, in terms of research design, specific test items, and programming those tests into a computer. The fifth member of my committee is Dr.

Aurelio Figueredo. He specializes in research design and statistics and has advised me in these areas and will help me even more once I have gathered all my data.

Jim Reynaert, Applications Systems Analyst, Principal, at the Learning Technologies Center on my campus taught me how to program in Flash, and he set up the lesson and test templates. Together with Aramian Wasielak, computer support staff for the Mathematics Department here, they are programming the bulk of the database required for my project.

I have gotten permission from the head of the English Department at the University of Talca, Jorge Meneses, my former boss, to recruit students from their classes. I am also in contact with Patricio Madariaga, head of IT at that university, who has offered any help necessary. Sabino Rivero, head of the Computer Science Department, has been in contact with me and the two people creating the database to make sure that the programs will function smoothly once housed on their server.