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Teaching Suprasegmentals Through Strategy Use and Technology

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Teaching Suprasegmentals Through Strategy Use and Technology

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Dedication

This report is dedicated to the language students who juggle impossible schedules and make incredible sacrifices in order to attend language classes. The hard work will pay off.

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Abstract

Teaching Suprasegmentals Through Strategy Use and Technology

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In an increasingly global world, there is a growing demand for pronunciation instruction. A focus on intelligibility as the goal in pronunciation instruction has risen to the forefront of the literature. Suprasegmentals are a practical goal for instruction since they have been shown to have a greater impact on overall intelligibility, but many language curricula do not allocate time or resources to pronunciation instruction at all, making it difficult for teachers to incorporate much needed suprasegmental learning in language classrooms. This Report suggests a practical way to incorporate suprasegmental learning in a mixed language background classroom: a project that incorporates a Web 2.0 tool, *VoiceThread*, and Covert Rehearsal Model strategy use.

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Chapter 1: Introduction

The majority of my English teaching experience has been working with adults who are learning a second language because they have a real life language learning necessity, such as a degree requirement or a need to communicate for a job. For example, one of my former students, Alex, ran a small landscaping business and frequently had to communicate with English speakers via email/text message and phone calls. He reported that he avoided making phone calls because he was frustrated and embarrassed by how many times he had to repeat himself because few people understood him over the phone. He also reported that he was embarrassed to speak face-to-face with clients because there were frequent communication breakdowns. He used email and text messages whenever possible to avoid oral communication. He had a firm grasp of English language structures and had absolutely no trouble getting his message across when writing, but somehow his two years of classroom English instruction had not given him sufficient skills to communicate orally. He had not been able to pinpoint what it was about his speech that was not intelligible to others, nor had he received any amount of focused pronunciation training in previous coursework, outside of drilling minimal pairs. Alex is just one example of a student who has struggled in getting his message across verbally and has been left feeling confused and helpless about how to improve his pronunciation due to lack of explicit instruction in his English courses.

Spurred by my students' demands for pronunciation instruction I began to search for activities and materials that would serve to improve the most common pronunciation difficulties of a classroom filled with speakers of different native language backgrounds. It was also important that these activities and materials had the possibility of being incorporated in a way that would not interfere with an already busy curriculum that often

allows little time for pronunciation instruction. I looked for ways in which learners would be able to practice on their own outside of class, since often there is not extra time to squeeze in pronunciation practice during class time. I was not able to readily find such materials that served the pronunciation learning needs of a mixed classroom.

I decided to do this review because as an English language instructor one of my worries has been how to integrate appropriate and relevant pronunciation instruction into a language classroom in any context. I was looking for a way to teach pronunciation (specifically suprasegmentals) that would be equally relevant and effective whether I was in an English as a Second Language (ESL) classroom in Austin, Texas, a university classroom in Korea, or a corporate classroom in India.

Through my time in graduate school at the University of Texas, I learned about the importance of suprasegmentals on overall intelligibility. Suprasegmental features are those vocal effects that extend over more than one sound segment in an utterance, such as stress, rhythm, and intonation, in contrast with segmental features, which are individual consonant and vowel sounds. Suprasegmental pronunciation features are a common difficulty for second language learners, regardless of their native language. Suprasegmental targets tend to be more universal pronunciation targets, whereas learners of different language backgrounds might have vastly different needs at the sound level.

In my studies, I found evidence of an overwhelming lack of focused, relevant pronunciation instruction in language classrooms (Derwing & Rossiter, 2002) Students do not know how or what to practice and they report that they either have received no instruction on pronunciation in class, or felt that they did not benefit from the instruction that they did receive (Derwing & Rossiter, 2002). Since the majority of teachers have received no training related to pronunciation instruction (Breitkreutz, Derwing & Rossiter, 2001; Foote, Holtby, & Derwing, 2011; Murphy, 2014) they are not able to pick

out different features of pronunciation and isolate the problematic features that the student should work on. They have no ability to assess options for pronunciation materials, nor do they know what methods to use (Derwing & Munro, 2005; Derwing & Rossiter, 2002). Due to these factors, sometimes teachers blindly follow commercial pronunciation materials. Derwing and Rossiter (2002) note that classroom pronunciation materials widely focus on segmental, not suprasegmental targets. This means students might be wasting time on targets that do not impede communication. Clearly, in language learning classrooms today there is a lack of relevant instruction and a corresponding lack of materials to assist learners in the acquisition of suprasegmental targets.

This Report serves to provide the theoretical framework and outline for a Web 2.0 classroom project for autonomous learning of suprasegmental targets. Chapter 2 provides a brief history on competing ideologies in pronunciation instruction and reviews research that has led to the wide acceptance of suprasegmentals as having a greater impact on intelligibility than segmentals, making a case for why suprasegmentals should be a focus of instruction. Chapter 3 discusses the research that demonstrates that it is actually possible for students to acquire suprasegmentals with explicit instruction, and also identifies some of the strategies and methods that were used to teach pronunciation in these studies. Chapter 4 highlights the potential of technology as a tool to foster learner autonomy and acquisition of pronunciation skills. Finally, Chapter 5 proposes a classroom intervention for autonomous learning of suprasegmentals through a Web 2.0 project that is conducted mostly outside of classroom time, following the strategies of the Covert Rehearsal Model (strategies outlined in detail).

Chapter 2: Why Focus on Suprasegmentals?

The following chapter highlights the shift between two competing ideologies in pronunciation teaching: the *nativeness principle*, which says that a learner should have the goal of native-like speech, and the intelligibility principle, which says that being comprehensible should be the goal (Levis, 2005). The following is by no means an all-inclusive list of ideologies and trends in pronunciation instruction; it serves to give a brief glimpse of what has influenced the goals of pronunciation instruction today.

TRENDS IN PRONUNCIATION TEACHING: THE SHIFT FROM THE NATIVENESS PRINCIPLE TO A FOCUS ON INTELLIGIBILITY

As argued in Chapter 1, pronunciation instruction in the language-learning classroom has fallen to the wayside in the last few decades, but pronunciation has not always taken a backseat to the four skills of reading, writing, speaking and listening. Under the influence of the Reform Movement and Audiolingualism language teaching models in the 1940's and into the 60's, pronunciation instruction was given priority in many language-learning curricula (Morley, 1991). Pronunciation instruction in this era focused on having learners achieve a native-like quality to their speech, in what Levis termed the *nativeness principle* (2005). Instruction under this principle required learners to listen to native speech and focus on repetition until they learned to speak in a similar manner, much like the familiar "listen and repeat after me" models that continue in classrooms today. A negative consequence of these approaches is that a lot of focus on drilling, imitation, and rote memorization of words led to poor fluency (Morley, 1991).

This focus on attainment of perfectly native-like speech came into question during the emergence and popularization of the Critical Period Hypothesis in the 1970's. The Critical Period Hypothesis maintains that after a certain age (somewhere around puberty)

it is not possible, or is quite a bit more difficult to achieve native-like speech in an L2 (Gass, 2013). Research emerging during the 1980's and 90's that looked into the effects of age on language learning indicated that it is extremely unlikely for adults and even young teenagers to achieve native-like pronunciation in a second language (Flege, Yeni-Komshian, & Liu, 1999; Johnson & Newport, 1989; Piske, MacKay, & Flege, 2001; Slavoff & Johnson, 1995). In addition, most of this research focused on immigrants who spent a considerable amount of time (average of 36 years in the second study) in North America; such attainment would be unlikely in the English as a Foreign Language (EFL) context (Flege et al., 1999; Piske et al., 2001). Later research has shown that there is not necessarily a precise cut-off age, but more of a sensitive period, starting around puberty, from which point the ability to acquire native-like speech gradually declines (Long, 1990). Ultimately, the findings of the research on age and accent attainment seemed to suggest that a goal of native-like speech was not a reasonable pronunciation goal for most language learners (Flege et al., 1999; Johnson & Newport, 1989; Piske et al., 2001; Slavoff & Johnson, 1995).

Around the same time that the Critical Period Hypothesis became widely discussed and corresponding research began to emerge (in the 1970's and into the late 1980's), some popular language teaching theories were emerging. The cognitive movement and communicative language teaching (CLT) theories emphasized authentic communications and group/pair work while downplaying the importance of pronunciation exercises (Jenkins, 2004). The focus was on getting students to talk, so error correction was minimized, especially when they were pronunciation errors. During the late 1980's and into the 1990's, CLT gained in popularity and became the dominant approach to language learning that it continues to be today (Celce-Murcia, Brinton, & Goodwin, 2010). Since traditional pronunciation instruction, with its drills and rote

memorization, does not fit into the goals of a classroom that emphasizes authentic tasks that represent real life communication skills, inclusion of pronunciation in ESL curricula diminished (Terrell, 1989). Furthermore, the publication of new materials on pronunciation was minimal after the communicative theories became popular, especially in comparison to publications of new materials on the four skills (Morley, 1991).

Spurred by globalization, there was an increased interest in English for Specific Purposes in the late 1980's and throughout the 1990's (Celce-Murcia et al., 2010). Many learners had the goal of learning a language to be able to communicate for a specific real world purpose such as international business, international study, to survive as a refugee in a new community (Morley, 1987), to form part of the tourism industry, or to teach English (Celce-Murcia et al., 2010), to name a few. Pronunciation errors were an impediment to communication, but the methods and goals of traditional pronunciation instruction offered little in terms of identification and correction of errors that caused breakdowns in communication. Common pronunciation instruction practices did not meet the demands of students that were interested in improving their pronunciation skills in order to be able to communicate in a world that was increasingly becoming more global and multilingual (Celce-Murcia et al., 2010).

Since researchers had found that the goal of acquiring native-like speech was probably not realistic, and considering that traditional pronunciation methods did not serve the goals of a communicative classroom, questions arose as to what the new goal of pronunciation instruction should be. Since many students were studying English to be able to function in a real world second/foreign language setting, it seemed practical that the goal of pronunciation instruction should be to be intelligible to listeners in order to get a message across (Derwing & Munro, 2005). A focus on becoming intelligible to listeners may have sounded like a practical goal, but little was known about what actually

makes people intelligible. Research that ensued suggested that perhaps speaking like a native speaker is not entirely necessary for effective communication (Derwing & Munro, 2005; Munro & Derwing, 1995). Munro and Derwing (1995) provided the empirical evidence that accent may not be the primary factor that impedes intelligibility. They conducted a study where native speakers judged learners' intelligibility, accuracy, and accent and found that while many speakers that had heavy accents also had low intelligibility, they also found that some speakers with heavy accents were easily understandable. Although the study carried out by Munro and Derwing (1995) was seminal for empirically investigating the relationship between intelligibility and other speech elements such as accent and perceived comprehensibility, they certainly were not the first to observe that there was a difference between accent and intelligibility (Abercrombie, 1949; Morley, 1991; Pennington & Richards, 1986).

Little was known about the construct of intelligibility, so researchers began to study contributing factors (Anderson-Hsieh, Johnson, & Koehler, 1992; Munro & Derwing, 1995; Hahn, 2004; Pennington & Ellis, 2000; Tajima, Port, & Dalby, 1997), and there was much focus on segmentals and suprasegmentals. As a result of these studies (which will be detailed in the following sections), it was found that suprasegmentals contribute more to intelligibility than segmentals, a viewpoint that is commonly held today (Derwing & Munro, 2005). This viewpoint has not gone unchallenged. One researcher who has challenged this claim is Jenkins, who saw the increasing globalization of English and studied English usage specifically between non-native speakers (NNS) (Jenkins, 2002, 2005, 2006).

WHAT IS THE ROLE OF INTELLIGIBILITY IN A GLOBALIZED WORLD?

With globalization, English is growing in popularity not only in NNS/NS interactions, but also between NNS's who do not have the same L1. Jenkins (2002) proposed the lingua franca core (LFC), or a focus on English as an International Language, instead of a focus on the two most common models of pronunciation, General American and Received Pronunciation, which she views to be not as teachable as her model. Jenkins argues that since NNS–NNS interactions are the most frequent of English interactions (Graddol, 1997), instructional priorities should be given to those features of language that cause most communication breakdown between NNS's. She studied a mixed nationality classroom of adult ESL learners, methodically noting which aspects of pronunciation most frequently caused communication breakdowns between the NNS's. Based on her findings, she proposed a set of instructional priorities that mostly focused on segmental features, such as consonant sounds and vowel length distinctions. Notably absent was a focus on suprasegmental targets as an instructional priority since she found that stress-timing and tone had no effect on intelligibility, and that linking even had a negative effect. The only suprasegmental target to which she gave any priority under the LFC was primary stress.

Jenkins's LFC proposal is controversial. Some question the validity of instructional priorities that downplay the importance of suprasegmentals when much research supports the claim that suprasegmental targets have a stronger effect on intelligibility than segmentals (Anderson-Hsieh et al., 1992; Munro & Derwing, 1995; Hahn, 2004; Pennington & Ellis, 2000; Tajima et al., 1997). Other opponents of the LFC argue that the instructional priorities (which were based on an ESL context) are not valid in other contexts (Levis, 2005; Saraceni, 2008). For example, Levis (2005) argues that the LFC does not apply in an EFL context since the learners are from the same L1

background and will converge toward a mutual intelligibility based on their L1, not an international mutual intelligibility. Most researchers agree that Jenkins's study not only needs to be reproduced, but also carried out in various contexts (not only ESL) in order for the priorities to be considered valid (Levis, 2005; Sewell, 2013).

Overall the goal of the LFC aligns with the goal of the intelligibility principle: for NNS's to become more intelligible to their listeners. On the other hand, the instructional priorities of the LFC (strong focus on segmentals, reduced emphasis on suprasegmentals) do not align with recent research that has shown the strong effect that suprasegmentals have on intelligibility. The following section highlights the research that contributed to the understanding of the strong role that suprasegmentals play in intelligibility.

INTELLIGIBILITY AND SUPRASEGMENTALS

If intelligibility is the instructional goal, which features of speech affect intelligibility most? There are a number of studies that look at the relationship between segmental and suprasegmental features of speech and how they affect intelligibility (Anderson-Hsieh et al., 1992; Derwing et al., 1998; Kendrick, 1997). In a study by Anderson-Hsieh et al. (1992), experienced English teachers listened to 60 NNS recordings to rate for segmental, syllabic, and prosody-related aspects of pronunciation (stress, rhythm, phrasing, and intonation). All three factors contributed to better comprehensibility ratings, but prosody had the most effect. This study shows support for suprasegmentals, although the listener ratings were subjective and based on overall prosody features; that is to say that they did not analyze for individual errors in suprasegmental features.

Other studies have narrowed in on suprasegmentals, and how one specific suprasegmental target or group of targets affect intelligibility (Hahn, 2004; Pennington &

Ellis, 2000; Tajima et al., 1997). Tajima et al. (1997) investigated the effects of temporal aspects of speech on intelligibility. This study was unique in its time for its focus on intelligibility, not accent, as many studies around this time were focused on accent. The researchers used four recordings: 1) a NNS speaking English, 2) a manipulated recording of the same speaker so that it would follow English temporal speech patterns, i.e. speech timing and rhythm, 3) a non-manipulated recording of a NS, and 4) the same recording manipulated to follow Chinese temporal patterns. Untrained listeners listened to the recordings and chose (between four phrases) what they thought they had heard. The results showed that the non-native speech manipulated to follow English temporal patterns was 19% more intelligible than the original, non-manipulated recording. The recording of the NS manipulated to follow Chinese speech patterns became 11% less intelligible than the non-manipulated NS recording. These results suggest that temporal patterns of speech have a significant impact on perceived intelligibility. In a similar study in which NNS recordings were manipulated to follow (or not) NS patterns, Hahn (2004) found that accuracy in one suprasegmental feature of speech, primary stress, affected intelligibility more than segmental features.

Pennington and Ellis (2000) investigated the role that attention plays in acquisition of prosodic features. Participants were tested for recognition memory between two sentences in which the only meaning change was marked by prosody. It was found that participants, unless cued, generally did not notice the difference between the sentences. It was found that the participants' memory of the sentences in which intonation marked contrastive stress improved after explicit instruction, suggesting that explicit instruction is an important component in the recognition of prosodic features of pronunciation.

Many follow-up studies corroborated evidence in favor of suprasegmentals having a strong effect on intelligibility (Zielinski, 2008). As a result of this research, it has become generally accepted that overall, suprasegmentals contribute more to intelligibility than segmentals, making a case for a focus on suprasegmentals in pronunciation instruction (Pennington & Ellis, 2000).

There is a growing body of research that focuses on pronunciation instruction of suprasegmental targets in the classroom that has proved that it is possible to teach students how to improve their intelligibility through explicit instruction on suprasegmental targets (Champagne-Muzar & Schneiderman, 1993; Chela-Flores, 1994; de Bot & Mailfert, 1982; de Bot, 1983; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; MacDonald, Yule, & Powers, 1994; Muller Levis & Levis, 2012; Perlmutter, 1989; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). There is more work to be done in the field of pronunciation research in terms of setting instructional priorities, but the following chapter highlights what has been done until this point in time to advance the field regarding the instruction of pronunciation, especially those studies that have explored the instruction of suprasegmental targets, which have been proven to promote intelligibility.

Chapter 3: Improved Intelligibility Through Explicit Instruction and Practice

The following chapter highlights the research that has been done up to this point regarding the explicit instruction of pronunciation in the classroom. Specifically, it discusses the research findings as well as the methods, tasks, and strategies used to teach and learn pronunciation in each study.

RESEARCH THAT SUPPORTS CLASSROOM INSTRUCTION OF PRONUNCIATION

As demonstrated in the following literature review, there is a growing body of research regarding classroom instruction of pronunciation. Many studies have been centered on the university or adult learner context. Many of the classroom studies reviewed in this section focused on pronunciation instruction that took place over at least a semester-long period of time (Champagne-Muzar & Schneiderman, 1993; Chela-Flores, 1994; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; Perlmutter, 1989; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013), but there are a few studies that looked at improvements that occurred as a result of short-term pronunciation instruction, as short as a period of a few hours (de Bot, 1983; de Bot & Mailfert, 1982; MacDonald et al., 1994; Muller Levis & Levis, 2012). In one such study over a two-day period, MacDonald et al. (1994) compared the performance of university ESL students under three different types of pronunciation instruction (interactive modification, self-study with cassette tape recordings in a language lab, teacher correction) to the performance of a control group with no pronunciation instruction at all. The first group underwent traditional classroom instruction in which the instructor gave explicit instruction and the students engaged in drilling activities. In the second group, each student worked individually in the language lab listening to and orally repeating after

recorded drills that represented the same targets as the first group. This group received no feedback. The third group participated in interaction-based procedures in which the students negotiated meaning with a NS and modified their speech as a result of clarification requests by the NS. The fourth group was a control group with no intervention of any type. They concluded that the students who underwent self-study in the language lab improved the most, although the researchers admit that these results were skewed by the fact that the self-study group had more time under instruction. The results for the students that received pronunciation instruction were positive overall. The control group fared only slightly worse than the groups that received instruction, although these results might have been magnified if the study were replicated to span a semester (instead of only two days). The results of the study may have been affected by the fact that the NS raters received no training and rated the recordings on a global scale of perceived improvement and were not instructed to listen for individual pronunciation features. The study, therefore, did not differentiate between improvement of individual segmental and suprasegmental targets.

A few short-term studies have focused on the improvement of one specific suprasegmental target after instruction (de Bot, 1983; de Bot & Mailfert, 1982; Muller Levis & Levis, 2012). De Bot and Mailfert (1982) reported on the results of two studies carried out in Holland and France, where it was found in both studies that adult students who received only perceptual training (visual and auditory) nevertheless improved in the production of intonation. In the Dutch study, the students took a pre-test, listened to a tape that described important aspects of intonation, and used a program in which pitch changes were represented on a screen. They took the post-test immediately after the intervention. The French study was carried out to replicate the Dutch study, but was carried out over the course of a week to put it in a teaching context. Like the Dutch study,

pitch changes were represented on the screen but they elaborated the training process by adding a funny story, including minimal pairs to show that intonation carries meaning, and having the students attempt to draw the contours of nine pre-recorded sentences (answers provided for self-correction). Improvement in production of intonation was notable in both studies, but the Dutch students who took the post-test immediately after the intervention fared slightly better.

In a similar but more focused study, de Bot (1983) compared two styles of intonation training: audio-visual and auditory-only training. He also compared the effect of the variable of time on intonation improvement. De Bot found that the group receiving audio-visual training showed more improvement in the production of intonation, which suggests that a visual representation of pronunciation patterns may be helpful to learners. The amount of time spent in practice had no effect on improvement in either feedback style group (45 minutes vs. 90 minutes), although a downside to both of these studies is that they only investigated the short-term, evaluating speech produced immediately after a short training session. In the audio-visual feedback group, the students listened to a pre-recorded sentence and then that sentence contour was displayed. The students then spoke the sentence aloud and the contour for their speech was displayed on the same screen as the target contour from the recording. The students could attempt to match this contour as many times as they liked. The process was the same for the auditory-only group, except that they did not see the visual contours for either the pre-recorded sentence or their own recording. The students in the audio-visual feedback group were found to repeat the sentence more often and to make more of an effort to self-correct, suggesting that the visual element increased student engagement with the training.

Muller Levis and Levis (2012), inspired by Pennington and Ellis's (2000) study that showed that NNS's can be taught to perceive contrastive focus, aimed to prove that

NNS's could not only be taught to perceive, but also produce contrastive focus. A group of ITA's at an American university received four hours of explicit instruction (listening to *TedTalks*, learning predictive rules and discourse markers, oral practice) on how to perceive, predict, and produce contrastive focus. Results were measured through a pre-test and post-test that counted each target hit. The students' improvement in the production of contrastive focus was even greater than hypothesized. The researchers concluded that students could be taught to produce contrastive focus through explicit instruction.

Short-term studies may not reflect a realistic classroom context in which instruction takes place over the course of many weeks. The following classroom studies have looked at the effects of long-term pronunciation instruction over the course of a semester or longer (Champagne-Muzar & Schneiderman 1993; Chela-Flores, 1994; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; Perlmutter, 1989; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). In one of the first studies investigating the effects of explicit pronunciation instruction on global intelligibility, Perlmutter (1989) measured the effectiveness of an International Teaching Assistant (ITA) training program by evaluating the perceived intelligibility of the ITA's after six months of explicit pronunciation instruction. The results showed that the ITAs' intelligibility rating had significantly improved when comparing a pre- and a post-task recording, although results may have been skewed because the untrained listener rated the NNS recordings on a 1-5 basis on a global scale of intelligibility, with no attention paid to specific errors. It also remains unclear if the improvements were due to the instruction or the amount of time in exposure to the L2. No description was provided of the methods used to teach pronunciation in this study.

In a frequently cited study, Derwing, et al. (1998) looked at the effect of eleven weeks of explicit instruction of both segmental and suprasegmental targets on ESL students. This was the first controlled classroom study to look at the effects of pronunciation instruction over several weeks, as well as the first study to empirically measure what impact segmental vs. suprasegmental instruction had on fluency, comprehensibility, and accentedness. There were three groups of students: one that received instruction in segmental targets, one that received instruction in suprasegmental targets, and a control group that received no pronunciation instruction at all. The tasks (recordings of the students reading a sentence and describing a picture) were rated by inexperienced undergraduates for comprehensibility and accentedness, and by six experienced ESL teachers for fluency, comprehensibility, and accentedness. They found that the group that received instruction in suprasegmentals improved in both comprehensibility and fluency. Speakers who had training in suprasegmentals were able to transfer these skills to spontaneous speech as well, whereas the segmental group could not. The researchers described the techniques as emphasizing both receptive and productive skills, saying that both groups followed traditional repetition drills. The global group employed jazz chants, readings, and group presentations. The segmental group did discrimination tasks as well as repetitions.

In another study that employed a control and experimental group, Champagne-Muzar and Schneiderman (1993) compared a control group with no specific pronunciation training to an experimental group that received twelve lessons in segmental and suprasegmental targets over the course of a semester. The lessons covered perception of these targets during the first six lessons, then production of targets during the next six weeks. Results showed that the control group demonstrated no improvement in the production of intonation and rhythm, and improved only slightly in the production of

phones, possibly due to learning the French alphabet. The experimental group showed no improvement in rhythm but significantly improved in their production of phones and intonation.

Other long-term classroom studies measured pronunciation improvement of one particular target (Chela-Flores, 1994; Sardegna, 2009, 2011, 2012). Chela-Flores (1994), in a semester-long study of adults studying English at a Venezuelan university, designed a set of ten lessons to separate rhythm patterns in words and phrases from their lexical meaning in order to help learners perceive overall patterns of rhythm. She found that the students were able to improve their production of rhythm overall, though most improvement occurred in a controlled task, not spontaneous tasks. The students underwent exercises that demanded aural perception before they were asked to orally produce. To separate lexical patterns from rhythm, the researcher created non-sense syllables to replace actual syllable sounds in order to first give the students a chance to feel the rhythm of the phrase before adding the meaning of the words. The exercises included: same-different drill, match the sentence to pattern a or b, non-sense syllables to repeat patterns, repetition of sentences with similar patterns, making up sentences that fit a particular pattern. Students reported an ability to spot their mistakes and self-correct.

Sardagna (2009, 2011, 2012) found that students (armed with predictive skills) who practiced using Dickerson's Covert Rehearsal Model improved their English linking and stress pronunciation skills after only four months of explicit instruction and oral practice as homework, and that a significant improvement was maintained from one to two years after receiving instruction for linking targets (Sardagna, 2011, 2012) and word, phrase, and compound stress targets (Sardagna 2009, 2012). Sardagna concluded that students could be empowered to improve their pronunciation through explicit instruction that provides appropriate resources and strategies so the students are able to effectively

practice on their own outside of class. The instructor employed Dickerson's Covert Rehearsal Model (CRM), which is a set of strategies that students follow when practicing pronunciation (full description of this model provided in Chapter 5). The teacher provided the students with specific predictive rules to identify which words receive stress and when to link sounds between words and phrases. The students practiced perception and prediction of the target before attempting to produce speech. The instructor provided feedback when necessary during practice. The students were given a model of proper pronunciation, such as a recording of target speech, as a model by which to compare their own production of target pronunciation patterns in class and in covert rehearsal at home. To assess long-term efficacy of instruction, Sardegna (2012) grouped learners according to self-efficacy beliefs, strategy use, and amount of practice reported after instruction (from 5 months to 2 years after the course), and achievement over time. The findings strongly suggested that while all the groups significantly improved over time, individual learner differences in terms of reported strategy use and practice as well as their self-efficacy beliefs are strong predictors of degree of progress over time.

The following studies looked at overall pronunciation improvement (no focus on one specific target) within a classroom setting (Kendrick, 1997; Kennedy & Trofimovich, 2010; Sardegna & McGregor, 2013). In a qualitative and quantitative study on the effectiveness of particular methods of explicit pronunciation instruction on EFL learners, Kendrick (1997) found that students' pronunciation of both segmental and suprasegmental targets improved after nine months of instruction. Most notable improvement corresponded to segmental targets, but suprasegmental target improvement, even though not as dramatic, appeared to have a greater effect on comprehensibility, suggesting it might be more of a priority in the classroom. Kendrick concluded, "successful acquisition of L2 pronunciation is affected by talkativeness, aptitude for oral

mimicry, and training” (p. 555). The activities used during nine months of instruction were based on a top-down approach that focused on the encouragement of oral production, with a heavy reliance on drama and oral mimicry. The students were recorded frequently to encourage self-awareness and self-monitoring skills, and to give them a general sense of responsibility for and control over pronunciation improvement. Kendrick gave a detailed description of the type of activities employed to practice both the perception and production of segmental and suprasegmental targets. The students practiced rhythm through chanting rhymes. They practiced the perception and production of stress through a variety of activities, such as identifying and marking stress in a passage, using clapping and visual representation of stress (stretching of rubber bands and objects of different lengths such as Cuisenaire rods), and practicing conversations that emphasized contrastive stress. The students used drama, role-plays, and speeches to practice not only specific intonation patterns, but also to practice and combine all the elements of pronunciation introduced. The teacher provided feedback on recorded assignments regularly.

Kennedy and Trofimovich (2010) researched the connection between student awareness of learning and pronunciation improvement. Learners kept a reflective journal in which they made comments about their pronunciation progress. Actual pronunciation progress was rated using a pre- and post-diagnostic test. Researchers found that the students’ overall intelligibility improved over the course of the semester, and that there was a relation between the number of qualitative comments (regarding how pronunciation affects communication) and pronunciation improvement. The 13-week university pronunciation course followed Hahn and Dickerson’s *Speechcraft* (1999), a book with a strong emphasis on predictive pronunciation skills. The course focused exclusively on suprasegmentals. Students received explicit instruction on a target,

listened to a sample of the target being used (a video of an interview, for example) and answered comprehension questions. The students then practiced imitating that model, trying to match their own speech to the model. Students also engaged in pairwork and groupwork speaking activities. The instructor actively monitored the students, providing guidance when necessary.

Sardegna and McGregor (2013) evaluated the effectiveness of a course that empowered students with pronunciation strategies and instructed them to (a) reflect on their strategy use and practice at home through weekly pronunciation trackers, and (b) self-assess their pronunciation progress through questionnaires. Students received explicit instruction on pronunciation features and strategies. Instruction and activities were designed to train students in the perception, production, and prediction of targets. A typical task consisted of marking a passage for intonation (for example), reading the passage aloud, self-monitoring speech, and changing speech to match a model (i.e. a recording of target-like speech). Students were able to record and re-record before turning in their best attempt at reading the passage aloud to the instructor for feedback. The results indicated significant improvement with the targeted suprasegmental features and provided evidence for the vital role of both teacher scaffolding (i.e. through strategy instruction) and learners' increased self-awareness of their errors (i.e. through their self-reflections and self-evaluations) for pronunciation improvement.

POTENTIAL LIST OF BEST PRACTICES

The findings in these studies clearly demonstrate that it is possible for learners, through explicit classroom instruction, to improve the pronunciation of suprasegmental targets that in turn directly aid in speech comprehension. From the varied methods used in these studies, it is clear that there is no consensus about what type of instruction is

superior in getting students to improve their suprasegmentals, nor is there a definitive list of best practices for teaching suprasegmentals. Even so, there are some commonalities between instruction methods in the studies that stand out as being potential best practices in the instruction of suprasegmental targets, although much research still needs to be done in the field to corroborate these findings.

All of the studies described in this chapter, except for de Bot and Mailfert (1982), which focused on perception only, focused on instruction that emphasized perception and production skills (Champagne-Muzar & Schneiderman, 1993; Chela-Flores, 1994; de Bot, 1983; Derwing, et al., 1998; Kendrick, 1997; MacDonald, et al., 1994; Muller Levis & Levis, 2012; Perlmutter, 1989), or perception, production, and prediction skills (Kennedy & Trofimovich, 2010; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). All of the studies described the implementation of a wide variety of oral practice techniques to practice production.

Most positive evidence for improvement of suprasegmental production was found during controlled tasks (Chela-Flores, 1994; de Bot, 1983; de Bot & Mailfert, 1982; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; Muller Levis & Levis, 2012; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). Task type during oral practice in these studies was both controlled and spontaneous, but a few studies went on to test spontaneous speech samples (Chela-Flores, 1994; Derwing et al., 1998; Kendrick, 1997; MacDonald et al., 1994). Chela-Flores (1994), who tested for both controlled and spontaneous speech, found more improvement in controlled speech samples. Derwing et al. (1998) found that both groups that received instruction in pronunciation improved in controlled tasks, whereas only the group receiving instruction on suprasegmental targets improved in spontaneous speech tasks. Kendrick (1997) saw

improvement in both controlled and spontaneous speech samples, and MacDonald et al., (1994), who only tested spontaneous speech, saw improvements in this category.

Another feature of instruction that was stressed in some of the studies was the importance of feedback, whether teacher-generated (Kendrick, 1997; Kennedy & Trofimovich, 2010; MacDonald, et al., 1994; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013), or computer-generated (de Bot, 1983; de Bot & Mailfert, 1982).

Even though some of the studies highlighted in this chapter did stress the importance of placing responsibility for pronunciation learning in the hands of the student in some capacity through self-reflection or strategy-use (Chela-Flores, 1994; de Bot, 1983; Kendrick, 1997; Kennedy & Trofimovich, 2010; MacDonald et al., 1994), few studies explicitly emphasized instruction of prediction skills that empower learners to be more autonomous and continue learning after the class is over (Kennedy & Trofimovich, 2010; Muller Levis & Levis, 2012; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). There is limitless potential for students who are given prediction skills and empowered to take responsibility over their pronunciation learning, especially in a classroom where little time is set aside for pronunciation practice, unfortunately students seldom receive instruction in predictive skills.

Technology is one classroom tool that has been cited for its potential in fostering learner autonomy and empowerment (Hafner & Miller, 2011; Godwin-Jones, 2011). Researchers have only just begun to investigate the potential for technology in language learning, but many have proposed that technology might be best suited for the instruction of pronunciation, citing the possibility for individualized instruction, visual feedback, and focused listening tasks (Kaltenboeck, 2001; Lear, 2013; Levis, 2007). The following chapter highlights the potential benefits of employing technological tools to promote acquisition of pronunciation skills and development of learner autonomy.

Chapter 4: Technology in Pronunciation Learning and Development of Learner Autonomy

The following chapter serves to highlight the potential of technology as a tool to facilitate acquisition of pronunciation skills and development of learner autonomy. The chapter starts with an overview of the different types of technology being used in language learning, and a description of what these tools have to offer in terms of fostering language learning. Next, it reviews relevant research on pronunciation learning through technology, including those studies that involved pronunciation learning through a classroom technology project. The chapter concludes with a discussion of the benefits of learner autonomy and the potential of technology as a tool to foster learner autonomy.

OVERVIEW

Computer Assisted Language Learning (CALL) is language learning that is facilitated by computer applications. There is a vast array of applications and tools being used in CALL: speech recognition technology, language learning software, internet-based tools that display information such as learning management systems, and newer internet applications (known as Web 2.0 applications) that provide the opportunity for interaction and collaboration, such as wikis and blogs. With faster Internet speeds and increasing accessibility, Internet-based tools have become popular classroom choices. Internet-based communication technologies can be divided into asynchronous and synchronous computer-mediated communication (CMC) tools. Asynchronous CMC encompasses tools that facilitate communication that does not take place in real time, such as email, discussion boards, blogs, and podcasting. Synchronous CMC are real-time communication tools, such as videoconferencing, voice and text chats, and instant messaging (Khalsa, Maloney-Krichmar, & Peyton, 2007).

There are many benefits to using technology in the language classroom. One of the most frequently cited benefits of CALL in general is that it creates an authentic environment for learners (Bueno, 2011; Sadler, 2007). CALL is also being used to promote collaborative construction of knowledge (Bueno, 2011; Godwin-Jones, 2011; Hafner & Miller, 2011; Murray, 2005; Sadler, 2007), to build a sense of community (Lord, 2008), to increase interaction and participation (Sadler, 2007), and to increase language-learning motivation in general (Bueno, 2011; Hafner & Miller, 2011; Lear, 2013; Lord, 2008; Murray, 2005; Sadler, 2007). Another major strength of CALL is the opportunity for individualized instruction (Bueno, 2010; Godwin-Jones, 2011; Lear, 2013; Tanner & Landon, 2009). CALL is also cited for its potential in fostering learner autonomy (Godwin-Jones, 2011; Hafner & Miller, 2011; Lear, 2013; Lord, 2008; Tanner & Landon, 2009). Due to the many possibilities that technology offers for language learning and the potential and proven benefits, many technology tools are being used in the classroom to promote language skills. There is also a small but growing body of research on pronunciation instruction through CALL (Bueno, 2010, 2011; Coniam, 2002; Ducate, Anderson, & Moreno, 2011; Ducate & Lomicka, 2009; Hardison, 2004; Herlihy & Pottage, 2013; Hirata, 2004; Lear, 2013; Levis & Pickering, 2004; Lord, 2008; Tanner & Landon, 2009; Wheeler, Yeomans, & Wheeler, 2008). The following section highlights the current research on CALL pronunciation instruction, including research that highlights pronunciation instruction through a CALL classroom project (Bueno, 2010, 2011; Ducate & Lomicka, 2009; Herlihy & Pottage, 2013; Lear, 2013; Lord, 2008; Tanner & Landon, 2009).

RESEARCH ON TECHNOLOGY AND PRONUNCIATION LEARNING

Pronunciation is currently being taught with a variety of methods and technological tools, but there is little literature to support practice (Lord, 2008). One general trend in the literature is a heavy focus on the assessment of pronunciation, not the teaching of pronunciation; that is to say that many studies investigate if pronunciation can be improved, with no analysis of the efficacy of specific methods being used to teach pronunciation. Another general trend in the literature is a lack of breadth when it comes to studies about the different technological tools being used to teach pronunciation. For example, the literature focuses heavily on speech recognition tools being used for pronunciation instruction, while the research is lacking overall regarding pronunciation-related software and Web 2.0 technologies (not related to speech recognition).

With the advent of speech recognition technology came an increased amount of research into the effectiveness of this technology as a pronunciation-learning tool. Speech recognition technology interprets oral samples and provides a visual display of speech patterns. If properly trained, students can compare and contrast the contours of their own speech samples to that of a native-speaker model, in an attempt to match patterns that perhaps they previously have not been able to detect aurally. Pronunciation instruction using speech recognition technology is known as computer assisted pronunciation teaching (CAPT). There are many studies that measured the effectiveness of segmental instruction via CAPT (Kawai & Hirose, 2000; Lambacher, 1999; Neri, Cucchiarini, & Strik, 2008; Wang & Munro, 2004), while other CAPT studies focused on improvement of suprasegmental targets, or both segmental and suprasegmental targets (Coniam, 2002; Hardison, 2004; Hirata, 2004; Lear, 2013; Levis & Pickering, 2004). In a reflective classroom study, Lear (2013) investigated the effect of CAPT on the segmental and prosodic pronunciation of a group of Japanese learners studying English. The project

used a reflective approach in which students became more aware of their pronunciation strengths and weaknesses. The students received explicit instruction in the form of a self-guided computer program instead of traditional classroom instruction. The learners earned a percentage of their final course grade by writing about the process of undergoing this training in a reflective journal. The students reported positive improvements in their pronunciation after receiving CAPT training, but since this was a self-assessment there is no statistical data showing that the students' pronunciation actually did improve.

In another qualitative study, Coniam (2002) studied how a group of English teachers raised their awareness of English stress-timing through explicit instruction and CAPT. Teacher trainees listened to a TV show and read from a transcript. They discriminated between NS and NNS's according to the sounds that they heard. The students were then given instruction on stress-timing and on how to read a waveform of the dialogue. The students' task was to attempt to match the waveform to the speaker. The teacher trainees did not practice production of stress, nor was there any statistical data to back up that they had actually improved their perception of English stress-timing.

Hardison (2004), in a quantitative/qualitative study, provided statistical data that showed that prosody patterns could be learned through CAPT training that directs students' attention to how prosody works within discourse. Qualitative data showed that learners' confidence increased with greater knowledge of how prosody works. This study focused on if prosody improvement was possible, not on what type of task is most affective in getting students to improve their prosody skills, so attention was not given to task type.

In a similar quantitative study, Hirata (2004) showed that native English speakers unfamiliar with Japanese speech patterns could be taught to perceive and produce pitch and durational contrasts through visual feedback from speech recognition technology.

Hirata found that an experimental group who received computer-based prosody training significantly outperformed a control group who received no prosody training. Students in the experimental group were first given training on the use of speech recognition technology. Then, during computer-led prosody training, students examined visual contours of word pairs or triplets (spoken by native-speakers) that contrasted in pitch and duration. These words appeared alone or were embedded into phrases and sentences. Next, the students orally produced the sentence and their speech contours were overlaid onto the native speaker sample. Students compared the samples and repeated the recording step until their speech contours were similar to that of the native speaker model. The control group did not receive any prosody training, but participated in the same pre- and post-tests.

Overall, these studies have shown that CAPT can be an effective tool for pronunciation instruction, but learners must be carefully instructed in how to use the technology since the interpretation of the visual displays is not readily obvious (Coniam, 2002; Hirata, 2004; Levis, 2007). Frequently, students do not receive proper training in the use of speech recognition technology; therefore, they do not improve their pronunciation skills.

While the literature on CAPT proliferates due to the potential that it holds for pronunciation learning, the literature on pronunciation learning via incorporation of CMC and Web 2.0 technology is scarce, given that many of these technologies are new and not geared towards use in education. Some of the existing studies of Web 2.0 tools being used to learn pronunciation have focused on students' self-assessment of pronunciation improvement, such as the study carried out by Herlihy and Pottage (2013), who investigated students' reflections on using *VoiceThread* (VT) to assess speaking skills. The students posted weekly speech samples such as introductions, student/student

interviews, and presentations, and the instructors left feedback regarding their pronunciation in these samples. Students went back and recorded again after receiving feedback, attempting to correct any patterns that were incorrectly produced. It was not clear how much or what type of instruction the students were given on pronunciation features and their functions, especially since after the project began, the instructors found that the students were not familiar with pronunciation metalanguage, so they had to backtrack and provide instruction on specific terms. While the students viewed incorporation of VT in assessment as useful and perceived changes in their “overall speaking, flow of ideas, word stress, intonation, pronunciation of individual words and word endings” (p. 11), there was no quantitative data to pinpoint exactly which elements of their pronunciation improved or how much, if any, improvement actually occurred.

There has been some quantitative research investigating the improvement of segmental targets through the incorporation of a classroom Web 2.0 project (Bueno, 2010, 2011; Ducate & Lomicka, 2009; Lord, 2008). Lord (2008) investigated the effect of a collaborative podcast project on the production of segmental targets in a Spanish phonetics classroom. Students received instruction in class, and then were given target-specific tasks to carry out online via podcasts, each task corresponding to a phonetic target learned in class. The tasks included reading a short text, providing a spontaneous speech sample, and recording tongue twisters. The only feedback received on these recordings was from classmates, not the teacher. Lord found that pronunciation did in fact improve over the course of the semester, but the findings may have been affected by the lack of inclusion of a control group and the fact that the students’ speech samples were rated holistically instead of on a per-target basis.

Ducate and Lomicka (2009) researched the effectiveness of a podcast project in improving the comprehensibility and accentedness of university students. The project

was self-guided and took place outside of class. Students recorded eight podcasts: five scripted, using a native speaker recording as a model, and three extemporaneous recordings. Both classmates and the instructor posted feedback on the extemporaneous recordings. There was no statistical improvement in comprehensibility or accentedness across the participants. The researchers concluded that the lack of improvement could have had its origin in lack of focused classroom practice and the fact that the project and its tasks were not built into the context of the greater course.

In two separate studies of classroom projects, Bueno investigated the role that vocal synchronous CMC (Skype) had in the acquisition of pronunciation with a focus on intelligibility (2010) and general speaking ability in the EFL context (2011). Bueno (2010) found that the students improved their pronunciation during conversational interchanges that involved open-ended questions over Skype (audio only), claiming that the improvement was due to breakdowns in communication that caused subsequent noticing. Her study only investigated improvement of phonetic targets. Her 2011 study was qualitative and quantitative and also implemented a SVCMC classroom project with a combination of in-class and out-of-class oral tasks similar to the tasks used in Bueno (2010), with the addition of a questionnaire to gather students' thoughts about their project. She compared an experimental group to a control group that partook in traditional face-to-face oral tasks and found that the experimental group not only outperformed the control group, but also reported an increase in satisfaction with their learning progress and decreased anxiety, factors which Bueno connects to acquisition of a second language.

There are few quantitative studies that investigate the effect that the incorporation of a Web 2.0 classroom project has on language learners' production of suprasegmental targets (Tanner & Landon, 2009). Tanner and Landon (2009) investigated the effect of

eleven weeks of self-directed Cued Pronunciation Readings (CPR) on intermediate-level university English language learners. In the CPR tasks, the learners were given an overview of pronunciation features, and then they practiced the perception of multiple suprasegmental targets at once by listening to a recording and answering comprehension questions. The answers were displayed on an answer key after each task. The students were then required to practice oral production of the suprasegmental features by reading a passage aloud, using a native speaker recording as a model. The students were required to record their best attempt (again each recording included the production of multiple targets). The researchers compared a control group to an experimental group to see if the CPR practice would have an impact of students' perception, production and perceived comprehensibility of pausing, word stress, and sentence-final intonation. The researchers found that learners showed statistically significant improvement in the perception of word stress and pausing, as well as the production of word stress. The students did not receive instruction or feedback from the instructor regarding the tasks throughout the training, a limitation listed at the end of the study.

The research in this section demonstrates that CALL can promote acquisition of pronunciation skills during the course of training, but autonomous learners are able to continue to improve their pronunciation skills even after the course has ended. One of the noted benefits of CALL is its potential as a tool for fostering learner autonomy, but autonomy does not occur automatically as a result of technology use. Kaltenboeck (2001) suggested that since technology cannot be expected to serve as a tutor it makes sense to shift the responsibility for language learning to the student users, arming them with self-correction and reflection skills and encouraging them to make their own choices. As seen in the discussion of the research, when incorporating CALL in the language classroom the role of the teacher changes from one of leader, to one of facilitator and coach.

Students may not know how to be autonomous learners so the instructor should arm them with skills for autonomous learning. The following section discusses the benefits of learner autonomy and how the use of technology in the classroom can promote autonomy in language learning. The following section also provides examples of how an instructor can facilitate autonomous learning.

TECHNOLOGY AND AUTONOMY

One of the most frequently noted benefits of incorporating technology in language learning is its potential to foster learner autonomy. In the past few decades, autonomous learning has been discussed widely in the literature (Hafner & Miller, 2011). Autonomy in learning means that the student is enabled (by a set of strategies given by the teacher) to take control over their learning process and language progress. Healey (2007) described autonomy as “knowing one’s goals for learning, preferred ways to learn, and ways to feel motivated, and then creating a learning community that allows ones to achieve these goals” (p. 388). An autonomous learner is enabled to continue his/her language learning far beyond the realm of the classroom. Technology has much to offer in terms of fostering learner autonomy.

For example, CALL can cater to learners’ personal learning styles. Kaltenboeck (2001) studied the potential of implementing a CD- ROM program to improve language learners’ intonation skills. He suggested that use of computers can enhance learner control and personalization of learning which leads to student autonomy. For example, learners can sometimes control their own pace, choose what content they want to consume (according to personal interests), work on language features that are particularly problematic for them, and choose methods and tasks that match their learning styles.

Another noted benefit of technology is the possibility for students to receive

feedback outside of the classroom. Godwin-Jones (2011) stated that CMC could help learners achieve “the kind of scaffolding that is helpful in guiding learners towards greater self-confidence and autonomy” (p. 7). Lear (2013) stated that students who are given feedback about their level are more motivated to achieve. Software and websites that offer feedback such as level indicators, awards, and progress reports can push those students who wouldn’t necessarily be autonomous by nature further than they would have pushed themselves, empowering them with self-awareness about their skill level (Healey, 2007). Technology can also serve as a reflective journal since the students’ progress is saved for later review and reflection. Reflective journals help students build learner autonomy by personalizing their learning experience, linking classroom concepts to their own personal experience and thoughts, which engages them in the learning process (Dantas-Whitney, 2002).

Learner autonomy is a frequently misunderstood phrase. Hafner and Miller (2011) state, “learner autonomy is often mistakenly equated solely with independent out-of-class learning in which learners are in control of all aspects of their learning process” (p. 69). Autonomy does not mean learning alone; it is a teacher and peer-scaffolded process that takes place within a social network. Use of technology in itself does not guarantee learner autonomy; the teacher plays an important role in activating these skills. The teacher can facilitate learner autonomy in a number of ways. Teachers can set the learners up for success in autonomy by selecting an appropriate technological tool. Not every tool will work in every context, and it is important that the teacher thoughtfully selects the appropriate technology for the learning situation, task, and level (Hafner & Miller, 2011). In the case of individual activities, the teacher should help the learner select appropriate tools and online resources (Godwin-Jones, 2011). Another way that a teacher can facilitate the development of learner autonomy is to demonstrate use of the tool, pointing

out benefits and drawbacks so students get the most from the use of the tool (Godwin-Jones, 2011). An essential role of the teacher is to facilitate autonomous learning by providing students with steps or strategies that detail specifically what they should do when they practice language skills on their own (Oxford, 2003; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). Considering autonomous learning does not equate learning alone, one component that is considered important in the development of learner autonomy is the presence of a peer network (Godwin-Jones, 2011). Teachers should consider incorporating an element of peer interaction when designing CALL projects.

Some have argued that a high priority on autonomy reflects Western beliefs and values (Healey, 2007). Instructors should be cautioned that enforcing learner autonomy might be met with some resistance, especially from students who come from teacher-centered cultures (common in Asia) who may see it as disrespectful to take an active role in learning (Godwin-Jones, 2011). The instructor could avoid such problems by educating students why autonomy is important and telling them about the benefits of autonomy.

Learner autonomy is one of the many potential and noted benefits of incorporating CALL in the language classroom. The amount of research regarding the use of CALL in teaching pronunciation is lagging behind in comparison to those studies that look at technology in the acquisition of other language skills. Even though there is little research, those studies that do exist show that technology is a promising tool for pronunciation learning. Inspired by students' motivation to effectively communicate and supported by the research regarding pronunciation instruction, CALL, and strategy use, I am proposing an intervention for using technology in the classroom to promote autonomous learning of suprasegmentals through the strategy use of the Covert Rehearsal

Model (CRM). The following chapter provides the theoretical framework and details of the proposed project.

Chapter 5: *VoiceThread* Project: Autonomy in Learning Suprasegmentals

This chapter provides the details of a pedagogical application for autonomous learning of suprasegmentals: a *VoiceThread* project that reinforces CRM strategy use. First, there is a description of the project's theoretical underpinnings, the Covert Rehearsal Model. Next, the design of the project is outlined so that instructors can recreate this project in the foreign language classroom. There is then a description of *VoiceThread*, the Web 2.0 tool used in this project, and a chart explaining how VT facilitates the use of CRM strategies. Finally, there is a discussion about potential problems in classroom projects and corresponding solutions.

THEORETICAL UNDERPINNINGS OF THE PROJECT: COVERT REHEARSAL MODEL

As seen in the review of the literature, there is no clear consensus about which methods should be used to teach pronunciation, but it is clear that there is support for communicative learning and student-directed learning. Morley (1991) proposed a framework for pronunciation teaching with a philosophy of integrating pronunciation instruction into a communicative classroom. The program she envisioned carried a dual-focus on speech production and speech elements (combining all these elements in a fluent manner in order to communicate). The goal of the learner was to become intelligible enough to serve a communicative need, to become more confident and feel empowered, and to develop monitoring and modification strategies that could be used outside the classroom. The instructional objectives were to provide students with short, very specific explanations of pronunciation features, develop learner self-involvement and responsibility through development of self-monitoring and speech modification skills and through achievement recognition; and finally provide varied practice that focuses on

perception, production, and prediction. The learners' role was an active one, and the teachers' role was to act as facilitator and coach. Morley's framework, while detailed, left many unanswered questions about how exactly to achieve all of this. What strategies should be used and what are the predictive rules?

Morley provided the theoretical framework for pronunciation learning, but Wayne Dickerson, in 1989, provided more detailed information on how this learning theory can be applied in the classroom. That is, Dickerson's Covert Rehearsal Model (CRM) is based on Morley's framework (the learner and teacher roles have not changed). CRM constitutes a set of steps learners should follow when they work outside of class to improve their pronunciation skills. Dickerson also provided predictive rules for pronunciation.

The goal of CRM is to help non-native speaking students hear, articulate, and predict the sounds, rhythm, and melody of words and phrases through the use of orthographically motivated rules and strategies (Dickerson, 1989, 2000; Sardegna, 2009, 2011, 2012). Many models of pronunciation focus only on perception and production skills, i.e. "listen and repeat" models. CRM teaches perception, production, and prediction skills. Prediction empowers students. If students can predict when certain sounds/speech patterns will occur, then they will be able to continue learning on their own far beyond the realm of the classroom (Sardegna, 2009, 2011, 2012). Students with prediction skills are able to correctly produce words and phrases that they have never heard before by applying the prediction rules that they learn in class.

CRM is a model that empowers students. The responsibility for pronunciation improvement very much lies with the student. The following is an explicit set of strategies (number one is not a strategy) that students use when practicing these perception, prediction and production skills at home.

6 Main Components of CRM

1. Find privacy
2. Perform aloud
3. Monitor performance
4. Compare your performance with models
5. Change your performance to match models
6. Practice changed performance aloud until fluent

(Dickerson 1989, 2000)

The six main components of CRM are steps that can be used in any order to practice perception, prediction, and production skills. To explain further, covert rehearsal is another way to say private practice. Practicing in private is crucial to improvement of pronunciation. When in a conversation, the main goal is getting the message across, and that means that speakers cannot focus on applying rules and proper delivery like they can alone in private. Most pronunciation improvement occurs outside of class when students practice in private because it allows them to internalize speech patterns without the distraction of spontaneous speech.

The second step of CRM is oral practice. Students need oral practice in order to improve oral skills. Self-monitoring is an important component of CRM. The students, with the models they have been presented in class, can go home and monitor their own speech, and then compare their performance to the models. Students change their performance to match the model until it becomes more natural and fluid.

A number of strategies can be used in any order to predict, produce or perceive elements of English pronunciation. For example, students can apply rules to judge the proper intonation of a phrase, use a mirror to correct their articulations, and listen for the primary stress of a phrase in recorded native speech, etc.

EMPIRICAL EVIDENCE IN SUPPORT OF THE COVERT REHEARSAL MODEL

CRM has been statistically proven. The work of Dr. Veronica G. Sardegna provides the research to support the success of CRM theory. She has empirically proven in a number of studies (Sardegna, 2008; 2009; 2011; 2012) that those students who use these strategies in covert rehearsal see long-term pronunciation improvement. Those students that engage the strategies of CRM see long-term pronunciation improvement in segmental, suprasegmental and connected speech features (Sardegna, 2008; 2009; 2011; 2012). CRM strategy use can be incorporated in many contexts. The following section provides an overview of a classroom project that incorporates technology and CRM strategy use to promote acquisition of suprasegmentals.

OVERVIEW OF PROJECT

The classroom intervention that I am proposing is a semester-long *VoiceThread* project that encourages learner autonomy in acquiring suprasegmentals. The project provides a vehicle for students to practice suprasegmental targets learned during in-class instruction. The project is designed to take place mainly outside of class time to hold the students accountable for pronunciation improvement, and also for practical reasons, considering that many language curricula do not typically devote much time to pronunciation.

VoiceThread (VT) is a Web 2.0 tool that helps users create annotated presentations with voice, video, and text narrative. Viewers of the presentation can add voice or text comments that will be available for other group members to see. There will be a discussion on why VT was chosen for this project in the following section.

The basic design of the project is that students make a weekly oral post to their VT accounts for each assigned task (each task contains instances of targets learned in class). Students are assigned to groups of four and are required to leave constructive

comments on their classmates' *VoiceThread* posts; it is also possible for students to record in pairs for dialogue tasks. The instructor leaves corrective feedback. The students receive a grade for completion of the project.

Each weekly task focuses on suprasegmental targets learned in class. The intention of this Report is to provide a framework for the project, not to provide the individual tasks since they should be adjusted to fit the priority pronunciation targets of each particular group of students (Sardegna & McGregor, 2013), and the tasks should be weaved into the context of each class (Ducate & Lomicka, 2009). The tasks do not need to be complicated; they typically involve reading aloud a dialogue or a short passage that contains target structures for that week, or that combines targets over multiple weeks. The website *TedTalks* (<https://www.ted.com/talks>) is a useful source for task creation since there are videos that can serve as a model of target speech patterns and scripts (for many of the videos, not all), which can serve as the passage for the task. *TedTalks* is also helpful because the instructor can search by subject to find a passage related to the context of the class.

The following dialogue is provided as an example of a task. This particular task was created to be a review of primary stress. Keep in mind that when students practice at home they need a model, such as a recording or a video, from which to compare their speech. The dialogue can be recorded by the instructor, for example, and posted online via the learning management system. The dialogue contains examples of primary phrase stress in contrasts, parentheticals, noun highlighting structures, and stress being used to highlight new vs. old information. Since this task is a dialogue, the student can record this task alone, or with a partner.

SAMPLE HOMEWORK TASK FROM VT PROJECT

Task 5-Phrase Stress Review

Record the following sentences orally on your VoiceThread, paying special attention to primary stress.

A: I like this shirt, Tabitha.

B: Which shirt?

A: The green one. They don't have my size, unfortunately.

B: There is a big stain on it, anyway.

A: Yeah, and these shirts are more expensive than Green Mart shirts.

B: Let's go to Green Mart. What do you think?

A: Which car did you drive? I have some furniture to buy.

B: There is a big furniture sale at the outlet mall.

A: But I can buy furniture at Green Mart and not have to worry about the return policies or driving all the way across the city.

B: I don't like Green Mart because their furniture prices are high.

A: Yes. The outlet mall has better prices, while Green Mart has better location.

B: Let's just go eat. I'm tired.

A: I'm not tired. Why are you so tired?

B: I'm just hungry.

A: Oh, that. Let's go!

The students know what steps to take while practicing suprasegmental targets at home because they have received in-class instruction not only in the perception, prediction, and production of the targets but also in CRM strategy use (see previous section for the details of CRM). The teacher must explicitly emphasize the importance of at-home practice. Students are encouraged to find a private place to practice. The students, armed with the speech model and predictive skills, provided in class by the instructor (see examples in Sardegna, Fu-Hao, & Gosh, [in press]) go home and practice using the same methods, listening to the model and attempting and re-attempting to match the model until speech is more fluent (Dickerson, 1989, 2000).

Students are encouraged to practice repeatedly and once they are ready, leave a recording that demonstrates understanding of and capability to produce target-like pronunciation of suprasegmentals. VT allows the user to delete and re-record, facilitating the process of oral practice and self-monitoring that is essential to pronunciation improvement. The final post should be the student's best attempt. The students are also required to comment orally on their group members' posts. This interaction promotes community, which is an important component of autonomous learning (Godwin-Jones, 2011). The collaboration component also provides students with a chance to analyze a speech sample other than their own, and provides an audience for the student's work to make the task more authentic (Wheeler et al., 2008). Students are divided into groups of four so that they will only have to comment on three other students' posts, making the task more manageable and the community tighter. The instructor plays an active role in the VT project, participating in commentary on the threads, offering guidance and feedback when necessary (Ducate et al., 2011; Lord, 2008). At the end of the semester, students receive a participation grade. Since all of the students' work is posted on a VT, it is simple for the instructor to grade individual work. The VT post also offers students a

chance to go back, re-listen to posts and reflect on the improvements made over the course of the semester, which Dantas-Whitney suggested contributes to learner autonomy (2002).

VT was selected for this project not only because it is free and user-friendly, but also because of how it can be implemented to facilitate strategy use. The following section provides explicit detail about how VT can facilitate each component CRM strategy use.

VOICETHREAD AND CRM: HOW THEY COMPLEMENT EACH OTHER

Component of CRM	How VT Facilitates CRM Strategy Use
Privacy	Students record their homework outside of class time, on their own, in private.
Oral Practice	VT has options for oral recording.
Speech Monitoring	Students have the recording by which to monitor their own speech. Students also build awareness by monitoring classmates' speech and offering feedback.
Compare with Model	Students can compare their recordings to the model provided in class, or compare and contrast their classmates' recordings with the model.
Change Speech to Match the Model	Students can record and then re-record until they match the model. Since their classmates/teacher will listen, students may be more likely to want to perfect the recording.
Practice	Students are required to practice as a component of the project; the project itself is practice.

Figure 1. How VoiceThread can facilitate CRM strategy use

Hafner and Miller (2011) suggest that during the planning phase of any classroom project, the instructor must carefully select the appropriate CALL tool. For example, in a speaking and listening class, it would make more sense to use a tool that encourages the student to speak or listen, such as videochat, than to incorporate a wiki, which is geared toward reading and writing. *VoiceThread* was selected specifically for this project because it provides a free, user-friendly arena for pronunciation practice, and ultimately, because of its potential as a tool to facilitate CRM strategy use, as outlined in Table 1. Students may not be familiar with VT or CRM strategy use, so it is necessary for teachers to provide explicit, in class instruction on both elements. The necessary classroom component will be briefly outlined in the following section.

CLASSROOM COMPONENT

Explicit in-class pronunciation and technical instruction occurs in conjunction with the VT project not only so the students learn suprasegmental targets, but also to train students in CRM strategy use and the use of *VoiceThread*. The students receive weekly instruction on English suprasegmental targets, which include, for example: contractions, reduction, linking, phrase stress, and intonation. The teacher must take into consideration the specific needs of the group of learners when selecting targets to teach since it is inefficient use of time to practice a skill that is not problematic for students. For those teachers who are not familiar with teaching suprasegmental targets, more information can be found in *Teaching Pronunciation* (Celce-Murcia et al., 2010) and in Hahn and Dickerson's *Speechcraft* (1999), and Sardegna et al., (in press). The teacher does not need to devote a lot of time to in-class instruction and practice since CRM strategy use demands that the students practice in private outside of class.

The in-class instruction and practice must model the steps of CRM. First, there is a quick formal presentation in which the teacher explains the chosen aspect of speech and provides predictive rules for when this feature of speech occurs. The teacher then provides a model of the target (this is authentic material such as video and audio recordings). The students practice the perception of the target. Only after they have learned to perceive the target do they begin to try to imitate the speech model. This can be done alone or in pair/group work. The activities move from more controlled to less controlled. The teacher is walking around, monitoring students' speech and providing feedback when necessary (Dickerson, 1989, 2000). By modeling these steps in classroom practice the students are armed with the skills to go home and effectively practice pronunciation targets on their own.

Before the project begins, it is important that the teacher provides clear instructions and expectations. In order to make the students feel comfortable using the technology and to prevent some of the errors stemming from misuse of technology, before the project begins the teacher provides formal, in-class training on how to set up a VT account, create a VT, and leave comments on classmates' VT posts (Godwin-Jones, 2011; Hafner & Miller, 2011). Another important issue that the instructor needs to address before the project begins is accessibility of technology. While many students will prefer to use their own devices (home computer, laptop, Ipad, smartphone with internet access), the instructor must provide an alternative, such as access to a computer lab, for any student that may not own such a device.

The VT project has a strong theoretical framework and thoughtful design that ties back to the literature on pronunciation learning and best practices for classroom projects. The VT project contains the following elements that led to pronunciation improvement in the literature on pronunciation instruction: tasks that involve an element of perception

and production (Champagne-Muzar & Schneiderman, 1993; Chela-Flores, 1994; de Bot, 1983; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; MacDonald, et al., 1994; Muller Levis & Levis, 2012; Perlmutter, 1989; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013), controlled tasks (Chela-Flores, 1994; de Bot, 1983; de Bot & Mailfert, 1982; Derwing, et al., 1998; Kendrick, 1997; Kennedy & Trofimovich, 2010; Muller Levis & Levis, 2012; Sardegna, 2009, 2011, 2012), an element of feedback (de Bot, 1983; de Bot & Mailfert, 1982; Kendrick, 1997; Kennedy & Trofimovich, 2010; MacDonald, et al., 1994; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013), incorporation of prediction skills (Kennedy & Trofimovich, 2010; Muller Levis & Levis, 2012; Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013), and incorporation of technology (Bueno, 2010, 2011; Coniam, 2002; Ducate et al., 2011; Ducate & Lomicka, 2009; Hardison, 2004; Herlihy & Pottage, 2013; Hirata, 2004; Lear, 2013; Levis & Pickering, 2004; Lord, 2008; Tanner & Landon, 2009; Wheeler et al., 2008).

The VT project was designed taking into account the emerging list of best practices from the literature on language classroom projects, but inevitably there will be problems that arise during the course of a classroom project. The following section serves to raise awareness of common problems that occur during CALL classroom projects so instructors can in turn prevent or manage such problems as they arise.

POTENTIAL PROBLEMS AND CORRESPONDING SOLUTIONS

Some common problems occur during CALL classroom projects, for example: issues stemming from planning and project design (Hafner & Miller, 2011), technical glitches (Bueno, 2011; Lord, 2008), problems with student collaboration (Bueno, 2011; Lord, 2008), motivation issues (Ducate et al., 2011; Healey, 2007; Wheeler et al., 2008),

and lack of authenticity of task (Ducate et al., 2011; Wheeler et al., 2008). From the growing number of studies on the incorporation of CALL in a second language classroom project and the literature about autonomy in language learning a potential list of best practices has emerged (Bueno, 2010, 2011; Ducate et al., 2011; Ducate & Lomicka, 2009; Godwin-Jones, 2011; Healey, 2007; Hafner & Miller, 2011; Kaltenboeck, 2001; Lord, 2008; Sadler, 2007; Tanner & Landon, 2009; Wheeler et al., 2008). The VT project was designed with these best practices in mind, but instructors need to be aware of common pitfalls in order to avoid them. The following section includes tips for how to prevent and manage common problems that might arise during the VT project.

Careful teacher planning and teacher involvement and guidance throughout are crucial to the success of the VT project. The project should be weaved into the context of the class if possible (Ducate & Lomicka, 2009). Projects that are meaningfully integrated into the context of the class tend to produce better results since there is cohesion of topics. The tasks for the VT project can easily be adjusted to reflect the topics and vocabulary being discussed in that week's unit. For example, if the students are learning about nutrition, the instructor can select an audio example and transcript related to nutrition that carries examples of linking, for example.

VoiceThread was chosen for this project because it is user-friendly, but unfortunately, technical difficulties are inevitable in classroom projects that integrate technology. To avoid unnecessary frustrations stemming from misuse or lack of understanding about how to use technology, teachers need to train themselves (Sadler, 2007) and students on proper use of the technological tool (Ducate et al., 2011; Godwin-Jones, 2011; Sadler, 2007). It is of utmost importance to provide in-class training on how to use VT in order to prevent common errors such as accidentally deleting a comment,

trouble uploading, and problems hearing a comment. Technical glitches should be addressed when and if they arise throughout the course of the project.

The teacher's pre-project planning and training is an important component of the project, but the teacher does not disappear once the project has begun. The teacher should be involved and provide guidance and feedback throughout the project in order to keep the students motivated (Ducate et al., 2011). Tanner and Landon (2009) and Lord (2008) did not incorporate teacher feedback into the design of their classroom projects and found that the students, in a post-study survey, desired teacher feedback in addition to feedback from classmates. Students do not always intuitively know how to collaborate with their peers. In many studies, it has been recommended that students be explicitly taught how to collaborate online and how to give feedback to their peers (Ducate et al., 2011; Hafner & Miller, 2011).

Another potential problem with any project, especially one that requires repetitive and methodical practice, is that the students will become unmotivated. As previously mentioned, motivation issues can be prevented by providing training on student collaboration and proper use of technology and by giving periodic feedback. Instructors should also offer clear, concise instructions for the project to prevent issues with motivation stemming from confusion about tasks (Ducate et al., 2011).

The community aspect of the project addresses motivation issues in some students. When students perform for an audience, they might focus more time on it to look good in front of their peers. Performing for an audience can give learners a sense of pride and accomplishment (Healey, 2007). Another way to motivate students is to give them control during tasks. Wheeler et al. (2008) found that student-directed activities have been shown to increase learner motivation. In the VT project, students control their

own thread and each post they make. The project should be graded to give extra motivation, and the instructor must describe assessment clearly.

One common problem that arises in language classroom projects is lack of authenticity of task. Students may not see the importance of practice if they feel it is not something that they would do in real life. The group component of the project addresses the need for authenticity of task because work with an audience provides authenticity (Wheeler et al., 2008). Some students may not feel comfortable or may not know how to offer feedback to their classmates. As previously mentioned, the instructor should provide training on what is appropriate when giving peer feedback and should actively monitor students' contributions (Ducate et al., 2011).

With attention given to the guidelines and suggestions provided in this Report, the VT project can be a practical and effective way for a mixed language background classroom (where typically little time is devoted to pronunciation practice) to learn suprasegmentals. Furthermore, equipped with CRM strategy use, students will be empowered to continue pronunciation improvement long after the project has ended (Sardegna, 2009, 2011, 2012).

Chapter 6: Conclusion

This Report serves to offer language teachers and learners a practical classroom project for autonomous learning of suprasegmentals that has its foundations in the latest research on pronunciation instruction. In this Report, I examine the goals of pronunciation instruction and outline the shift in focus on getting students to produce native-like speech to making students more intelligible to their listeners. I highlight the research that shows the important role that suprasegmentals play in overall intelligibility, and how these targets are a common difficulty among language learners of different language backgrounds, giving relevance to the teaching of suprasegmentals in a classroom with students from mixed language backgrounds. The research to date has shown that it is possible (a) to learn suprasegmental targets, and (b) to learn these targets through explicit classroom instruction. Unfortunately, despite the growing research on this subject, few language learners receive explicit instruction of suprasegmental targets in the classroom. Many curricula do not include much (if any) pronunciation instruction, so instructors need a quick and efficient way to teach pronunciation and get students to practice pronunciation targets on their own. Though the research to back practice is limited, technology has been highlighted for its potential in the area of pronunciation instruction, especially due to its potential as a tool for fostering learner autonomy. Learner autonomy is invaluable in a language classroom where typically there is little time devoted to pronunciation practice. Students armed with strategies for learning have the potential to be autonomous learners. Taking all these factors into account, I proposed a project using a Web 2.0 tool, *VoiceThread*, which promotes learner autonomy in learning suprasegmentals. This project employs Dickerson's Covert Rehearsal Model, which consists of a process that incorporates a set of strategies that students can use to

practice pronunciation at home, in private. This is a practical and relevant project for a mixed language background classroom in which there is a great need for improved intelligibility, but little time to devote to learning suprasegmental targets. I hope that teachers will find this Report and suggested project useful, and that language learners will feel empowered to improve their pronunciation as a result of incorporating of this project in the language-learning classroom.

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