

PODCASTING: AN EFFECTIVE TOOL FOR HONING LANGUAGE STUDENTS' PRONUNCIATION?

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This paper reports on an investigation of podcasting as a tool for honing pronunciation skills in intermediate language learning. We examined the effects of using podcasts to improve pronunciation in second language learning and how students' attitudes changed toward pronunciation over the semester. A total of 22 students in intermediate German and French courses made five scripted pronunciation recordings throughout the semester. After the pronunciation recordings, students produced three extemporaneous podcasts. Students also completed a pre- and post-survey based on Elliott's (1995) Pronunciation Attitude Inventory to assess their perspectives regarding pronunciation. Students' pronunciation, extemporaneous recordings, and surveys were analyzed to explore changes over the semester. Data analysis revealed that students' pronunciation did not significantly improve in regard to accentedness or comprehensibility, perhaps because the 16-week long treatment was too short to foster significant improvement and there was no in-class pronunciation practice. The podcast project, however, was perceived positively by students, and they appreciated the feedback given for each scripted recording and enjoyed opportunities for creativity during extemporaneous podcasts. Future studies might seek to delineate more specific guidelines or examine how teacher involvement might be adapted to the use of podcasts as a companion to classroom instruction.

INTRODUCTION

As evidenced by this special issue on teaching pronunciation, foreign language (FL) teachers are often challenged by the ongoing debate on how to teach pronunciation across proficiency levels. While some teachers feel there is often not enough class time to practice pronunciation, including intonation or prosody (Munro & Derwing, 2007; Ramírez-Verdugo, 2006), others may not enjoy nor know how to teach pronunciation, or they may believe that students simply find it boring (Stevick, Morley, & Wallace Robinett, 1975). Furthermore, some teachers may be reluctant to teach pronunciation due to lack of training in phonetics (Weinberg & Knoerr, 2003). Teaching pronunciation in a class specific to pronunciation, phonology, or phonetics may seem more feasible than in a typical language classroom. However, these types of classes normally only occur in the upper levels, so students in beginning language classes could be deprived of systematic pronunciation training until late in their language learning careers.

Historically, with the advent of the communicative approach, there may have been some confusion as to the place and role of pronunciation in language learning. Terrell (1989), for example, suggests that those teaching from a communicative approach "have not known what to do with pronunciation" (p. 197). Likewise, Pennington and Richards (1986) discuss that pronunciation is often viewed as having "limited importance" in communicative curricula (p. 207). As a result of the perceived confusion with regard to the role of pronunciation in the communicative approach, language teachers struggle to find ways to practice pronunciation in class (Lord, 2008). Further, Elliott (1995) maintains that "teachers tend to view pronunciation as the least useful of the basic language skills and therefore they generally sacrifice teaching pronunciation in order to spend valuable class time on other areas of the language" (p. 531).

Although teachers sometimes forgo pronunciation instruction to spend time on aspects of the FL that they find more important, pronunciation plays a significant role in comprehensibility (Anderson-Hsieh & Koehler, 1988). Leather (1999) points out that non-native speakers (NNSs) with poor pronunciation can

even be “personally downgraded because of their accent” (p. 35). While there are a variety of factors that affect pronunciation, including age, individual differences, motivation, and instruction (Leather 1999; Moyer, 1999), teachers should take advantage of the factors over which they have control: instruction and exposure.

How might technology provide us with tools to address this challenge? When reflecting on computer-mediated communication and technology tools in general, Thorne and Payne (2005) suggest, “...one of the principle critiques of textual CMC (computer mediated communication) has been that oral speech and aural comprehension are not explicitly exercised” (p. 386). Podcasting may offer a possible option for practicing speaking skills outside of class. Podcasts are easy-to-create audio files that can be uploaded to the Internet and to which users can subscribe. Our study attempts to explore this option by using podcasting to hone pronunciation skills outside of class. Intermediate level students of French and German created eight podcasts (scripted and extemporaneous) in order to practice pronunciation and to apply their newly practiced pronunciation skills to a more creative, contextualized task. Students also completed a pre- and post-survey based on Elliott’s (1995) Pronunciation Attitude Inventory (PAI) to assess their changing perspectives on the role of pronunciation in language learning. Students’ scripted pronunciation and extemporaneous recordings as well as surveys were rated for accentedness and comprehensibility.

Research on Pronunciation

Comprehension Studies

Many studies have investigated global non-native pronunciation to assess what factors affect pronunciation (Piper & Cansin, 1988; Thompson, 1991), help improve pronunciation (Derwing & Rossiter, 2003; Graeme, 2006; Lord, 2005; Magen, 1998; O’Brien, 2004; Ramírez-Verdugo, 2006; Riney & Flege, 1998), and contribute to accent and comprehension (Brennan & Brennan, 1981; Jilka, 2000; Munro & Derwing, 2007). While the age that someone begins learning a FL seems to have the largest effect on pronunciation (Piper & Cansin, 1988; Thompson, 1991), studies have shown that training can also help to improve students’ pronunciation (Graeme, 2006; Lord, 2005; Ramírez-Verdugo, 2006). After two weeks of training on specific sounds, Graeme (2006) found that the average error rate dropped from 19.9% to 5.5%, and in a delayed post-test to 7.5%, which illustrates that focused instruction can lead to phonological changes. In another study, members of an experimental group improved significantly after listening to native speakers (NSs) and comparing their own speech with the NSs’ (Ramírez-Verdugo, 2006). In a Spanish phonetics class, students who received explicit phonetics instruction improved their pronunciation on specific features (Lord, 2005). The findings of these studies show that “raising [second language (L2)] learners’ awareness of the important role of intonation systems is an attainable aim” (Ramírez-Verdugo, 2006, p. 153) that can ultimately help to improve students’ FL pronunciation.

In addition to comprehension, prosody represents another important aspect of pronunciation. Prosody is defined as the “patterns in individual words of stress, pitch, and tone and rhythmic and intonational patterns of longer utterances” (Pennington, 1989, p. 22). As Munro and Derwing (1995) found, the presence of a strong accent does not necessarily hinder intelligibility; in their study, some speakers were rated as heavily accented even though the listeners understood everything. The researchers attribute this apparent contradiction to the effects of inaccurate prosody. Since prosody has been found to be one of the main reasons speech can be perceived as accented, even more than individual sounds, (Anderson-Hsieh & Koehler, 1988; Munro, 1995; Pennington, 1989), prosody training for students at all levels is recommended as part of communicative language teaching (Chun, 1988; O’Brien, 2004; Pennington, 1989; Van Els & de Bot, 1987; Volle, 2005). As learners tend to use L1 (first language) intonation patterns when speaking in the L2 (Ramírez-Verdugo, 2006), they need to be explicitly taught the prosody of the L2. One way to achieve this practice, as well as practice in comprehension and accentedness, is through the use of technology.

Using Technology to Improve Pronunciation

Technology has been used in many ways to improve students' pronunciation. Since students often have a difficult time hearing their own pronunciation mistakes and judging the nativelikeness of their speech, visual displays can help to show specific sounds and the patterns of prosody (Ehsani & Knodt, 1998; Hardison, 2004; Martin, 2004; Pennington, 1989; Ramírez-Verdugo, 2006; Seferoglu, 2005). Automated speech recognition (ASR) tools, such as [WinPitch](#) for example, are advantageous because they do not rely on students' own perceptions of their pronunciation, but they show exactly how their sounds compare to those of NSs (native speakers) (Ehsani & Knodt, 1998; Martin, 2004; O'Brien, 2006). One drawback of ASR (automatic sound recognition) tools, however, as pointed out by O'Brien (2004) is their lack of contextualization. Technology, specifically the use of podcasts, could offer opportunities for contextualizing tasks, while at the same time honing pronunciation. The next section provides a brief introduction to podcasting, including how it can be used in FL classes and how it has been utilized for pronunciation tasks. We then describe the details of a podcasting project implemented to improve students' pronunciation and prosody.

Podcasting

In recent years, Internet audio has greatly increased in popularity (McCarty, 2005). One recent example of Internet audio, a podcast, is an audio file that anyone can create using a computer, microphone, and a software program. Once posted to the web, podcasts can be accessed, downloaded and played to a computer or MP3 player. The popularity of podcasts can be linked to their simplicity in creating, editing, publishing and listening to them. Another reason that could be attributed to their rising popularity, according to Tan and Mong (n.d.), is the "...increasingly widespread ownership of MP3 players and the relative ease with which individual podcasters can create and distribute files" (p. 2). Harris Interactive (2007) reports that players are extremely popular among young adults, noting a marked increase among college students in particular. Due to the increased popularity of podcasts and ownership of MP3 devices, the use of podcasting has begun to find its way into educational settings.

Uses of Podcasting in Education

Podcasting is being used in a variety of ways in all levels and disciplines of education. More traditionally, it can be used to distribute lecture material. This material is available as a review (for those in class), or, if students or teachers are absent, a podcast can serve to distribute the missed information (Tavales & Skevoulis, 2006). Podcasting can empower students by giving them opportunities to create and publish for a real audience (Stanley, 2006) and facilitate recording and distributing news broadcasts, developing brochures, creating or listening to teachers' notes, recording lectures distributed directly to students' MP3 players, recording meeting and conference notes, supporting student projects and interviews, and providing oral history archiving and on-demand distribution (Meng, 2005).

More specific to language learning, podcasting has several theoretical underpinnings in second language acquisition (SLA) research. Swain and Lapkin (1995) recognize output as essential for second language learning. One strategy they suggest is having students listen to themselves as they edit their output, and then go back, listen again, and revise as necessary. They can also receive feedback from other students and their instructor. This type of approach could be quite useful in podcasting as it is easy to record, re-record and listen to various segments of a podcast. After students record podcasts, they can listen multiple times, edit their podcasts and comment on their classmates' recordings (see also Lord, 2008; Meng, 2005).

Although we know that the use of audio in education is far from a novelty, podcasting and MP3 devices have brought a newfound excitement to the classroom. [Osaka Jogakuin College](#) in Japan was the first school to provide iPods to incoming students. Podcasts downloaded to the iPods consisted of audio learning aids to help with the learning of English (McCarty, 2005).² Podcasting trends can now be found

in different parts of the world—many universities and colleges³ are embarking on projects using MP3 devices and podcasting in innovative ways.

Podcasting Projects Specific to Pronunciation

However educators decide to use podcasts, it is first important to determine instructional goals (O'Bryan & Hegelheimer, 2007) and keep the emphasis on pedagogy (Rosell-Aguilar, 2007, 2009). In keeping these objectives in mind, practice with pronunciation, listening, and speaking are specific ways that foreign language teachers and learners can tap into this technological tool. Using podcasting in contextualized language learning (as opposed to simple pronunciation drills) can also be useful in that it allows teachers to contextualize pronunciation and create meaningful tasks, rather than simply have students repeat and practice lists of words or sounds. Chan and Lee (2005) note “audio has been vastly neglected and underused as a teaching and learning medium in recent years” (p. 62). Therefore, it is not surprising that language teachers would be interested in podcasts.

McQuillan (2006b) highlights several tasks that focus on oral production, such as using audio diaries, conducting interviews with native speakers, and hosting talk shows where students “can record themselves and classmates for a classroom assignment and provide speech samples to the teacher for assessment” (p. 6). Tavales and Skevoulis (2006) suggest that students can record themselves or native speakers and then engage in listening practice as they focus on pronunciation, grammar use or intonation. Amemiya, Hasegawa, Kaneko, Miyakoda, and Tsukahara (2007) report on a study using a foreign word learning system with iPods, where they examine pronunciation and images of the vocabulary items ($n = 10$) with iPods versus pen and paper. Results indicate that some of the iPod group participants claimed that they continued to hear the pronunciation of the word even when not listening to the iPod. No immediate difference in the groups was found following the experiment; however, after 2 weeks, the iPod participants retained the meaning of 40% of the English words using the system, while only 27% were retained by the conventional paper-and-pencil group.

Lord's (2008) study is one of few research projects targeting pronunciation and podcasting specific to FL teaching. Nineteen students in an undergraduate phonetics class recorded tongue-twisters, short readings, and personal reflections on their own pronunciation. Lord used the Pronunciation Attitude Inventory (Elliott, 1995) as well as scores from six oral tasks, rated by three judges on overall pronunciation ability. Both attitudes and pronunciation abilities were assessed pre-semester and post-semester; both were found to improve. Podcasts also remained available as references for students to revisit and work on individual pronunciation issues.

Research specific to podcasting, part of the field of computer-assisted language learning (CALL), remains a young and growing area. There has consistently been a lack of empirical research and SLA based research with innovative technologies when they emerge, and most often we are confronted with a focus on student perceptions, beliefs, and attitudes. Levy (2007) claims that the researcher's approach and goals may differ depending on whether the technology is already established or just emerging. He further explains that emerging or new technology often begins with pilot studies or investigations of attitudes and perceptions (for example, surveys).

Since the field of podcasting in FL learning remains relatively undeveloped, it is to be expected that the work available thus far consists of reports on pilot studies and investigations of student perceptions. Young (2007), for example, in her article on iPods, developed a survey to administer to students to find out more about language students' perspectives on iPod or MP3 player use. Lee and Chan (2007) report on research with 18 students studying information technology who participated in a survey after listening to 3-5 minute podcasts (nine total) over the course of a semester. Results indicate that students perceived listening to the podcasts as worthwhile and enjoyable. O'Bryan and Hegelheimer (2006) report that over the course of a semester, graduate and undergraduate students ($n = 6$) listened to 14 podcasts for a listening course. Based on surveys, interviews, and a teacher reflective journal, results regarding attitudes,

feelings about podcasts, and student needs suggest that the podcasts were viewed very positively and that few technical problems occurred. These preliminary studies substantiate Levy's claim that because podcasting is an emerging technology, much of the literature surrounding it has focused on survey work or pilot studies that attempt to pave the way for more research (Lee & Chan, 2007; O'Bryan & Hegelheimer, 2006) or on the technical how-tos and practical ideas for using podcasting in the classroom (see also: Diem, 2005; Godwin-Jones, 2005; McCarty, 2005; McQuillan, 2006a; Stanley, 2006; Young, 2007).

In spite of these few preliminary studies on aspects of podcasting such as learner reactions and attitudes, the field remains young and is growing exponentially. The current study sought to broaden existing research on podcasting and pronunciation and to continue to advance the research conducted to date. To further explore pronunciation within a contextualized podcasting approach, our study sought to investigate the following questions:

1. Did students' comprehensibility and accentedness improve from their pre-test to post-test?
2. Was there a difference in comprehensibility and accentedness between the extemporaneous podcasts and the scripted podcasts?
3. Did students' comprehensibility and accentedness improve with each task?
4. Did students have positive attitudes towards the pronunciation tasks and feel their pronunciation improved?

Using a mixed methodology design, qualitative and quantitative data were collected and analyzed in order to investigate these questions.

METHOD

Participants

The participants in this study consisted of 12 students learning German and 10 learners of French ($n = 22$), all L1 of American English, enrolled at a university in the United States during one academic semester. Students were enrolled in intermediate level language classes (fourth semester) and were between the ages of 18 and 22 years old. Twelve (4 in French, 8 in German) of the students had been to French or German speaking countries for varying amounts of time, but none more than a summer. Participation in the project was completed over a 16-week period and participants were selected based on a convenience sample. In other words, intact groups of students enrolled in these intermediate courses were asked to provide consent to participate in this project.⁴

Materials

In previous studies on pronunciation, the elicitation techniques have included repetition based on NS models (Olson & Samuels, 1973; Snow & Hoefnagel-Höhle 1977), reading (Munro & Derwing, 2001) and extemporaneous speech (Elliott, 1995; Thompson, 1991). In order to assess the differences between scripted and extemporaneous tasks, we chose to employ two different types of elicitation techniques. Students recorded a total of 8 podcasts over the course of the semester. At the beginning of the project, students received 60 to 90 minutes of technical training on how to create and upload podcasts to their blogs. All podcast tasks were contextualized around the theme of study abroad.

Scripted Pronunciation Podcasts

Students recorded 5 scripted pronunciation podcasts (pre-, scripted 1, 2, 3, and post-) between 2 and 3 minutes in length, each related to study abroad. The texts⁵ used in the pre- and post- podcasts were identical, lasted about 3 minutes, and were first-hand accounts of a French or German student beginning a study abroad experience in the U.S. The texts for podcasts 1, 2 and 3 were chosen to prepare students for the contextualized podcast tasks and read by a NS. Students listened to the podcasts and then made their

recordings, which were posted as podcasts to personal blogs they had created for their German or French course.

Extemporaneous Podcasts

Students recorded a total of 3 extemporaneous podcasts during the semester. Texts that students listened to and completed during the pronunciation podcasts served as a model for students to use for each of these podcasts. See [Table 1](#) for a description of each task.

Pronunciation Attitude Inventory

The pre-test PAI survey (based on Elliott, 1995) consisted of 12 Likert-type questions that assessed students' attitudes toward pronunciation and 9 background information questions (see [Appendix A](#)). The post-test PAI survey consisted of the same 12 Likert-type questions, 8 additional Likert-type questions and 6 open-ended questions specific to students' attitudes toward the podcasting project. The 14 additional items on the post inventory assessed students' likes and dislikes with regard to the project, what they found helpful to improve their pronunciation, and any suggested changes.

Procedure

After making their own recordings, students were required to listen to classmates' extemporaneous podcasts and post comments on the content. The extemporaneous podcasts were graded by the instructor of each class using a rubric that took into account content, coherency and organization, pronunciation and fluency, accuracy, creativity, and impact on the listener (see [Appendix B](#)). For the scripted pronunciation podcasts, a NS assistant listened to each student's recorded podcast, provided a written assessment with detailed feedback to the student (see [Appendix C](#)) and occasionally left comments to the podcasts on students' blogs. All students maintained an individual blog, where each podcast was posted. The blogs and podcasts were therefore available for anyone on the Internet to visit. [Table 1](#) provides the timeline and details for these tasks.

Table 1. *Pronunciation and Podcast Tasks*

Step 1	Pre-Pronunciation Survey (PAI)
Step 2	Pre-Task Listening
Step 3	Scripted Pronunciation Podcast 1 (study abroad experience) – Listen and Pronounce
Step 4	Extemporaneous Podcast 1 – Intercultural story/misunderstanding that occurred either in US or abroad and what you learned from it (2-3 minutes)
Step 5	Scripted Pronunciation Podcast 2 (interview with someone who had studied abroad) – Listen and Pronounce
Step 6	Extemporaneous Podcast 2 – Interview someone who has studied abroad in a French or German speaking country and discuss stereotypes s/he had of people in that country before s/he went and stereotypes people had of him/her as an American. (3-4 minutes)
Step 7	Scripted Pronunciation Podcast 3 (description of a French/German city) – Listen and Pronounce
Step 8	Extemporaneous Podcast 3 – Research a French/German town in which you would be interested in studying abroad. Then create a radio advertisement (what to see, do, eat, sleep, university, classes, etc.) for the city. Remember that you are trying to encourage your classmates to visit you here, so make it sound interesting. (3-4 minutes)
Step 9	Post-task Listening
Step 10	Post-Pronunciation Survey (PAI)

RESULTS

Data Analysis

For the purposes of analysis, students' podcasts (8 per student) were downloaded and stored on a computer or CD. They were assigned random numbers and then judged by two raters⁶ in each language, for a total of four judges in the study: one NS of the target language and one NNS (the NNS tested at or above an advanced low proficiency level) for each language.⁷ All raters were graduate students in German or French. Before beginning to rate the samples, the judges attended a training session with the researchers where they rated several samples from the data set together. Two judges for each language were used to account for any possible variation between raters since Munro and Derwing (1995) found that raters notice different factors when rating comprehensibility and accentedness.

Each podcast was rated using a 5-point comprehensibility scale (completely, mostly, fairly, almost not, not comprehensible) and a 5-point accentedness scale (nativelike, almost nativelike, between nativelike and nonnative, more nonnative, and nonnative). The 5-point scale was chosen to give raters an uneven amount of options, but not too many from which to choose (Anderson-Hsieh & Koehler, 1988; Bongaerts, van Summeren, Planken, & Schils, 1997; Elliott, 1995; Major, 1987; Olson & Samuels, 1973; Oyama, 1976; Snow & Hoefnagel-Höhle, 1977; Piper & Cansin, 1988; Thompson, 1991). Since a strong accent does not necessarily affect comprehensibility (Munro & Derwing, 1995), the two scales were chosen to assess both how well students can be comprehended by a NS as well as their accentedness as compared to that of a NS. Accentedness and/or comprehensibility are two common characteristics that have been considered in previous pronunciation studies (Anderson-Hsieh & Koehler, 1988; Bongaerts, et al.; Derwing & Rossiter, 2003; Derwing & Munro, 1997; Elliott, 1995; Thompson, 1991), and were therefore chosen in this study to be appropriate measures of NNS pronunciation.

The samples in our study ranged from 2-4 minutes in length in order to give students a chance to ease into the text and to allow them to practice prosody. Since students were producing longer segments of speech, we hoped that they would listen both to how individual words were pronounced as well as how they were strung together in the NS examples to help them improve their prosody when speaking. To allow raters to take note of especially nativelike or non-nativelike prosody, they were instructed to listen to each sample in its entirety before applying the 5-point scale.⁸ Judges were instructed to rate samples using only whole numbers between 1 and 5. In order to assess the differences between extemporaneous and scripted speech, both types of samples were used (see for example, Ramírez-Verdugo, 2006).

For the quantitative analysis of the data, all of the two raters' scorings were averaged in each language. In 95% of the cases, the raters varied by no more than one number (2 vs. 3, for example). A Wilcoxon Signed Ranks test was used to compare the results of both the PAI pre- and post-tests as well as the results of the accentedness and comprehensibility scales. This method of analysis was chosen because it is a non-parametric test that is able to deal with more than two groups and analyzes the magnitude of the differences between pairs. Since we were analyzing the change between pairs (pre-test and post-test speech segments, for example), this test was deemed most appropriate for our analysis. In addition to the Wilcoxon Signed Ranks test, the percentage improvement was calculated to assess the percentage of students who improved between tasks (see [Table 2](#)). As mentioned above, in reference to the pronunciation samples, the pre was compared to the post, the scripted to the extemporaneous, the scripted 1 to 2 and 2 to 3, and the extemporaneous 1 to 2 and 2 to 3 to search for statistically significant differences among the samples. In addition, each podcast was analyzed according to comprehensibility and accentedness and will be discussed accordingly in the results. The French and German samples were of course analyzed separately, since students read different texts in different languages for each task.

Comprehensibility Ratings

Among the German comprehensibility ratings, there were no significant differences. The difference between the first and second extemporaneous recordings (E1/E2) approached but did not reach significance ($p = .066$), where 44% of the students ($n = 9$)⁹ improved in comprehensibility in the second extemporaneous segment. Among the French comprehensibility ratings, there was one significant difference ($p = .049$), where 9% of the students ($n = 10$) received higher comprehensibility ratings on the second scripted sample compared to the first scripted sample (S1/S2).

Although there was only one significant difference regarding comprehensibility, the trends revealed in the data point to insights into learner patterns regarding comprehensibility. The finding that 30% of German students improved from the pre- to the post-test in terms of comprehensibility coincided with the trend of the entire semester where for each task, not more than 33% of students improved, except for the difference between the first and second extemporaneous tasks, which almost reached significance. While considerable improvement was apparent for the French group between the first and second scripted segments, Table 2 reveals a lower percentage (10%) of improvement for comprehensibility between the second and third scripted segments (S2/S3). Other notable improvements include a 40% increase in pre- and post-test scores, comprehensibility improvement when comparing the extemporaneous tasks (40%, 50%), and a 40% improvement in comprehensibility when comparing the first and third scripted tasks with the respective extemporaneous tasks.

Table 2. *Percent Improvement in Tasks*¹⁰

Task Comparison	Pre/post	S1/S2	S2/S3	E1/E2	E2/E3	S1/E1	S2/E2	S3/E3
German Comprehensibility	30%	33%	20%	44%	33%	20%	33%	10%
German Accentedness	50%	44%	10%*	44%	33%	10%	0%*	80%
French Comprehensibility	40%	90%*	10%	40%	50%	40%	20%	40%
French Accentedness	10%	70%*	10%	20%	10%	30%	10%	40%

Note. S = scripted podcast; E = extemporaneous podcast

* Indicates significant difference at the .05 level

Accentedness Ratings

Among the German accentedness ratings, there was a significant difference between the second extemporaneous and scripted (S2/E2) samples ($p = .024$) with 0% ($n = 9$) of the students performing better on the extemporaneous sample (see Table 2). There was also a significant difference between the second and third scripted (S2/S3) segment ($p = .047$) with only 10% ($n = 10$) of students improving between treatments. Among the French accentedness ratings, there was a significant difference between the second scripted sample and the first scripted (S1/S2) sample ($p = .011$) with 70% ($n = 10$) of the students improving.

Regarding improvement of accent, 50% of German students improved from the pre- to the post-test. 44% of German students improved between the first and second scripted tasks (S1/S2), 44% improved between the first and second extemporaneous tasks (E1/E2), and 80% improved from the third scripted to the third extemporaneous task (S3/E3). For the French students, Table 2 reveals that students' accentedness did not improve much from the pre- to post-test (10%). While the greatest increase was between the first and second scripted (S1/S2) tasks (70%), students also made minimal gains in their overall performance when comparing the scripted with the extemporaneous tasks (30%, 10%, 40%).

In addition to overall accent, the raters noted specific sounds with which students had problems. Among the German students, the largest problems concerned differentiating between [ʏ], [yː], [ʊ] and [uː] sounds (53 out of 85 samples, 62%, were noted to have difficulties), prosody (48 out of 85: 56%),

differentiating between a [z] and an [s] (37 out of 85: 44%), pronouncing [ɛ] (36 out of 85: 42%), differentiating between [ç] and [x] (28 out of 85: 33%), pronouncing [œ] (21 out of 85: 25%), pronouncing [v] (18 out of 85: 21%), and enunciating “-tion” (10 out of 85: 12%). The fact that students had difficulty with prosody and [ɛ] was not surprising since O’Brien (2004) had similar results in her study. On a positive note, there were also sounds that students produced that were more native sounding. For example, many students pronounced shorter, more common words, such as *hier*, *ich*, and *Deutsch*, with almost native-like proficiency. Eight out of the 85 samples (9%) had almost native-like prosody. For the students in French, the most challenging areas included: difficulty making liaisons (14 out of 78: 18%), pronouncing the French [r] (34 out of 78: 44%), problems with silent sounds in word endings (38 out of 78: 49%), and pronouncing the sounds [y] (16 out of 78: 21%) and [ø] (11 out of 78: 14%). Thirty out of 78 (38%) of the samples were given positive comments with regard to prosody.

PAI Results

The PAI was administered at the beginning and at the end of the semester for both groups [pre: $n = 22$; post $n = 21$] in order to compare any changes in students’ attitudes with regard to pronunciation. A Wilcoxon Signed Ranks test was used to compare the results of both the PAI pre- and post-tests and revealed no significant differences (see Table 3 for each p value). A second test was administered to compare the differences (gains and losses) for each question of the PAI. While a few questions revealed a slight variation in the gains and losses, the test confirmed that there were not significant differences in the students’ attitudes from the beginning to the end of the semester.

Table 3. p Values for PAI Wilcoxon Signed Ranks Test

	Q1Post- Q1Pre	Q2Post- Q2Pre	Q3Post- Q3Pre	Q4Post- Q4Pre	Q5Post- Q5Pre	Q6Post- Q6Pre	Q7Post- Q7Pre	Q8Post- Q8Pre	Q9Post- Q9Pre	Q10Post- Q10Pre	Q11Post- Q11Pre	Q12Post- Q12Pre
Asymp. Sig. (2- tailed)	.317	.317	.163	.655	.206	1.000	.180	.290	.210	.705	.854	.380

Note. No significant differences (alpha level of .05).

While the statistics provide us with some information about students’ attitudes, we must also examine the short answer sections attached to the PAI questions. Although we had anticipated that more students would enjoy the extemporaneous tasks because they encouraged more creativity, 12 out of 20 (60%) participants preferred the scripted podcasts over the extemporaneous podcasts. Some students reported that they took less time and were therefore easier to accomplish: “The pronunciation podcasts were far easier and took much less time, so I liked them more, but I enjoyed the creative podcasts more.” Other students enjoyed listening to the NS model before recording themselves: “Overall, I enjoyed the pronunciation podcasts more. I think this is because on the more creative ones, I wasn’t able to hear someone else pronounce everything, so there were times when I wasn’t really sure how to say something, which is kind of frustrating.” Another student felt the scripted texts “helped more with [his/her] accent.” Some students also felt the feedback provided after the scripted texts was extremely helpful: “The comments made on [the pronunciation texts] helped me to see what specifically I was doing wrong, and also it was helpful to hear the words spoken correctly; it made it easier to try to imitate those sounds.” Another student commented on the process of recording the scripted texts: “With the pronunciation podcasts, you can listen over and over until the correct pronunciation is ingrained in your head, which is helpful when you’re trying to improve on that pronunciation.” Overall, students reported that they appreciated completing tasks that focused on pronunciation and the model and feedback by a NS. They also recognized the value of the extemporaneous texts for promoting creativity and simulating real life situations. Moreover, many students indicated their desire to participate in a similar project in the future.

GENERAL DISCUSSION

The first three research questions asked if students' pronunciation improved from the pre-test to the post-test—if there was a significant difference in pronunciation between the extemporaneous podcasts and the scripted podcasts and if students improved with each task. According to the statistical analysis, there were no consistent significant differences from the pre- to the post-test, over time, or between tasks. The only significant difference in terms of improvement was regarding French students' comprehensibility and accentedness from scripted task 1 to 2.

With regard to change over time between similar tasks, the German students did not improve significantly over time regarding comprehensibility. However, there were some changes with regard to accentedness. Over the course of the semester, from the pre- to the post-test, 50% of students improved their accent.

There was also an improvement of 44% of German students from the first to the second extemporaneous tasks in comprehensibility and accentedness. A possible reason for this higher rating could be due to the fact that students were conducting an interview in the second sample and therefore attended more to their pronunciation than they had in the first extemporaneous task. As suggested by Rajadurai (2007), the presence of an interlocutor may encourage students to be more comprehensible to facilitate communication.

Although there is no evidence to explain the unexpected result regarding the low rate of accent improvement between scripted tasks 2 and 3, where there was a significant difference, one could speculate that perhaps the German students treated the second scripted segment with more care in their recordings, or that they simply were busy with end-of-the semester work at the time of the third recording. The French students also did not score as well between the second and third scripted segments as they did between the first and the second in terms of both accentedness and comprehensibility. Perhaps students found the interview (second scripted segment) easier or more interesting (given that they knew both the interviewer, who was their teacher, and the interviewee, who was the NS working with them) to produce than they did with the first scripted segment, which simply discussed the importance of study abroad.

As for the extemporaneous, contextualized tasks, students in both languages showed little improvement. This finding could be due to the fact that students focused more on what they wanted to say than how they actually said it or in other words, they focused more on meaning than form. Since the task required more creativity and students were not able to simply read a prepared text, they may have not devoted as much energy to pronunciation itself or they may not have focused as much attention to form (vs. meaning). Whatever the case may be for the unexpected results, it is important to point out that within both learner groups, there were no repeated significant changes over time and in all cases, students did not consistently improve with each treatment.

In terms of task type, the lack of consistent significant differences between the scripted and extemporaneous segments indicates that for these participants the two tasks were relatively similar. Only in the case of the German students did 80% rate higher for accentedness for the third extemporaneous task than the scripted task. Since this was an advertisement for a city where they might want to study abroad, which allowed for more creativity, perhaps motivation was higher and they were more excited about the assignment and attended more to their accent. In all other cases, though, it is interesting to note that students performed similarly whether they were reading a text or speaking extemporaneously. These results are consistent with those of Moyer (1999) and Munro and Derwing (1994), but contradict the findings of Oyama (1976) and Thompson (1991). Although it had been hypothesized that students would score higher in the scripted samples because they only had to focus on pronunciation, perhaps the lack of focus on meaning hindered their pronunciation, while the focus on meaning in the extemporaneous samples led to increased attention to pronunciation as well.

There are several possible explanations as to why these participants did not experience substantial improvement in their pronunciation in terms of accentedness and comprehensibility. First, perhaps 16 weeks is not a sufficient amount of time to make gains in pronunciation, especially in an intermediate language course where the focus is not specifically dedicated to this task. While Lord's (2008) study indicates some improvement in pronunciation, we must consider that her course focused exclusively on phonetics and pronunciation. Similarly in Graeme's (2006) study, in which students improved their pronunciation over a semester, they focused only on specific phonemes, not global pronunciation. Although the students in the present study focused more on pronunciation than in typical fourth-semester language classes, 8 treatments in 16 weeks does not seem to constitute enough devoted time to facilitate a marked improvement. Their in-class work focused mainly on practicing interpretive and interpersonal skills, not specifically pronunciation. As evidenced in O'Brien's (2004) research, students make larger gains in pronunciation when in a study abroad context or as Lord (2005) illustrated, perhaps it is necessary for students to enroll in a phonetics and phonology course specifically designed to focus on pronunciation for students to make noticeable improvement, as pronunciation was not a focus in either learner group.

In terms of comprehensibility, it is possible that the lack of significant differences from pre- to post-test is due to a ceiling effect. Most of the participants were already completely or mostly comprehensible at the beginning of the semester, although this fact was not known when participants were recruited.¹¹ For the German pre-test, 10 out of 12 students received a ranking of 1 (completely comprehensible) or 2 (mostly comprehensible) and for the post-test, all of the students received a 1 or a 2. For all of the other tasks throughout the semester, both scripted and extemporaneous, most students continued to receive high scores (1 or 2) for comprehensibility. For the French class, 9 out of 10 students received a rating of 1 or 2 for both the pre- and post- tests for comprehensibility. For all other tasks, students received ratings of 1, 2, or 3. While the lack of perceived change between the pre- and post-test is not encouraging, it is remarkable that most of the students in these fourth semester German/French classes were already almost completely comprehensible and by the end of the semester, everyone was rated as completely or mostly comprehensible.

The results of the accentedness ratings illustrate that students remained more or less the same throughout the semester. The majority of German students (at least 8 for each sample) received a rating of 3 (between native-like and nonnative), 4 (more nonnative), or 5 (nonnative) for all of the treatments. The French students consistently received ratings of 2 or 3 throughout the semester for all treatments, although there was little improvement between the second and third pronunciation tasks. These results also suggest that 16 weeks and 8 treatments is not enough time for improvement in terms of accentedness. Although students received feedback from a NS on specific phonemes they needed to practice, there was little time in class to devote to this practice. Students were also encouraged to make use of the free tutoring to work on these issues, but they were seemingly unable to make substantial improvements on their own, or perhaps chose to focus their efforts elsewhere.

In response to the last research question, whether students had positive attitudes towards pronunciation and felt their pronunciation improved during the semester, statistics again revealed no significant differences in the pre- and post-tests. In examining the frequencies for each question, most answers stayed the same between the PAIs. It is worth noting, however, that there was some variation for two inventory items. For item 8 (*Communicating is much more important than sounding like a native speaker of French/German*), more students valued communication by the end of the semester than they did when they began their intermediate language course. Responses to item 9 (*Good pronunciation skills in French/German are not as important as learning vocabulary and grammar*) indicated that by the semester's end more students valued grammar and vocabulary over pronunciation. It seemed therefore, that students valued pronunciation less by the end of the semester. This attitude may not be surprising since these intermediate courses emphasized communication, vocabulary and grammar during class and

encouraged students to practice pronunciation independently outside of class as part of the podcasting project. Perhaps their high scores on comprehensibility also communicated to students that they were already comprehensible and therefore did not need to worry as much about their pronunciation as they may have previously, which could help to relieve some anxiety when speaking.

Pedagogical Implications

The results of this study suggest that podcasting and repeated recordings alone are not enough to improve pronunciation over an academic semester. Based on our findings, we have several suggestions for how FL instructors could integrate podcasting into their classes in order to lead to more advances in pronunciation.

Even though the current model in most FL textbooks is to provide pronunciation exercises for students to practice outside of class, which is similar to the design of our project, such independent study does not seem sufficient. If teachers hope that students' pronunciation will improve as a result of outside practice with CDs, MP3s, or podcasts, it may require more focused and consistent pronunciation practice in class or meetings outside of class with a NS in addition to the assigned tasks, ideally as a supplement to the podcasting exercises. Once students receive feedback on podcasts, for example, they could work with a NS tutor or with the class to improve specific sounds with which they had difficulty or more generally, prosody.

Another supplement to podcasting tasks could be computer-assisted visual feedback. With appropriate training, students could visually and aurally compare their sounds to those of NSs to improve specific trouble areas (Ehsani & Knodt, 1998; Hardison, 2004; Martin, 2004; O'Brien, 2006). As mentioned above though, this software should be combined with podcasting since ASR software often lacks a context (O'Brien, 2006) and podcasts can be recorded for a specific purpose and audience. In addition, more classroom practice in prosody, including pronunciation practice in context, would be useful to students. This type of practice could be accomplished by having students repeat longer discourse such as dialogues, as suggested by Moyer (1999), by drawing students' attention to prosody during communicative tasks, and by including prosody as a component in assessment.

Due to the small sample size, small number of raters, and limited amount of time, we have several suggestions for further research. It would be useful to conduct a similar study with lower proficiency students to see if there might be greater statistical improvement, considering that many of our pretest ratings were near the highest rating. Since there were only 22 students in this study, the results are not generalizable. Further studies with podcasting that include more students and levels, more NS raters or NNS raters at a superior level,¹² and even other languages could be conducted to investigate whether students' pronunciation might improve over a year or even longer. Since there is not a large emphasis placed on pronunciation in most beginning and intermediate language classes, our aim was for podcasts to be able to provide this extra practice that is lacking and we designed our tasks to encourage students to focus on and be aware of their pronunciation. It would, therefore, be useful to examine in a follow-up study the results of a similar podcasting project conducted in conjunction with dedicated practice in class and/or with a NS tutor or visualization software to assist students with their specific difficulties. The effect of an interlocutor on pronunciation could also be examined, as the results of the German students corroborated those of Rajadurai (2007), who found that students' pronunciation improved when speaking with someone else.

While our study is based on holistic evaluation and allows primarily for a general account of pronunciation improvement, a more detailed examination of the acquisition of particular pronunciation features, as well as the impact podcasting can have on these features would be worth investigation.

Further, although the raters were to take into account the students' pronunciation at both the segmental and the suprasegmental levels, only one rating scale involved accentedness, so it could have been difficult to distinguish between the two levels. Improvement at one level is not necessarily dependent on

improvement at the other level, and perhaps the lack of ratings allowing for a distinction between segments and prosody may have contributed to the lack of overall significant differences between pre- and post-tests. We suggest the use of measurement instruments allowing for a distinction between the segmental and the suprasegmental levels in future studies of this kind. In addition, samples by NSs and NNSs with little exposure to the target language should be included in the pool of samples in future studies to provide raters with a broader range of levels of comprehensibility for the purpose of comparison. It is possible, that because students in the current study were at similar levels, the raters mainly compared them with each other in terms of comprehensibility; therefore they were judged similarly. Addressing some of the limitations in this study would provide useful data for future projects and add to the growing number of empirical studies on implementing podcasting in FL classes.

NOTES

1. Both authors contributed equally to this manuscript.
2. Other pioneering projects include those at [Duke University](#) and [Middlebury College](#) (cited in Thorne & Payne, 2005) and the [University of Wisconsin](#) ([The University of Wisconsin Language Institute Website](#), n.d.).
3. Some examples of other universities using podcasts include the [Texas Language Technology Center](#) at UT Austin where podcasts are offered for speakers of Spanish learning Portuguese, featuring pronunciation and grammar. [The University of Wisconsin at Madison's Department of German](#) produces [podcasts](#) for different levels of language learners studying German. See, for example: <http://german.lss.wisc.edu/gdgsa/podcast>
4. While we asked participants to provide information on their prior language background, we did not inquire about their prior use with technology because a 90-minute training session was provided to all participants. Students had access to a soundproof room in the language lab where they could conduct their recordings.
5. All of the authentic texts used for the pronunciation podcasts were found on the Internet.
6. The terms raters and judges are used interchangeably in this paper.
7. Raters were selected from a pool of available Graduate Teaching Assistants (GTAs).
8. The length of speech samples has varied among pronunciation studies from one word (Flege & Munro, 1994; González-Bueno, 1997; Moyer, 1999), to a phrase or sentence (Derwing & Munro, 1997; Flege, Frieda, & Nozawa, 1997; Munro & Derwing, 1998, 2001; Riney & Flege, 1998), or even to a longer 30-90 second clip (Elliot, 1995; Piper & Cansin, 1988).
9. While there were 12 German students in the class, not all of the students completed all of the tasks. Hence for some of the comparisons, the *n* is less than 12.
10. The improvement reflects an increased rating from the first task listed to the second task listed.
11. Comprehensibility is a complex feature of pronunciation that could be influenced by a number of factors. Influence of study abroad on pronunciation is an important factor that should be considered in future studies, especially considering that 12 out of 22 of the students in this study had been abroad.
12. NSs are normally used as raters, and there are also cases where superior level non-native speakers have been deemed to be appropriate raters (Elliott, 1995; Lord, 2005, 2008; Olson & Samuels, 1973).

13. The questions below were added to the post-questionnaire to collect students' feedback on the podcasting project. The pre-questionnaire consisted only of the first 12 questions in the PAI. Both questionnaires were completed on-line.

APPENDIXES

Appendix A: Pre- and Post- Surveys

The Pronunciation Attitude Inventory (PAI) (Adapted from Elliott, 1995)

Please read the following statements and choose the response that best corresponds to your beliefs and attitudes.

Please answer all items using the following response categories:

- 5 = Always or almost always true of me
- 4 = Usually true of me
- 3 = Somewhat true of me
- 2 = Usually not true of me
- 1 = Never or almost never true of me

1. I'd like to sound as native as possible when speaking a foreign language.
2. Acquiring proper pronunciation in a foreign language is important to me.
3. I will never be able to speak a foreign language with a good accent.
4. I believe I can improve my pronunciation skills in my foreign language.
5. I believe more emphasis should be given to proper pronunciation in class.
6. One of my personal goals is to acquire proper pronunciation skills and preferably be able to pass as a near-native speaker of the language.
7. I try to imitate foreign language speakers as much as possible.
8. Communicating is much more important than sounding like a native speaker of my foreign language.
9. Good pronunciation skills in my foreign language are not as important as learning vocabulary and grammar.
10. I want to improve my accent when speaking my foreign language.
11. I'm concerned with my progress in my pronunciation of my foreign language.
12. Sounding like a native speaker is very important to me.

Additional Questions¹³

Please answer the following questions based on your experiences this semester with the blogs and podcasts.

strongly agree *agree* *neutral* *disagree* *strongly disagree*
 SA A N D SD

1. I enjoyed posting some of my assignments to my blog this semester.	SA	A	N	D	SD
2. I enjoyed reading my classmates' blogs and listening to their podcasts this semester.	SA	A	N	D	SD
3. I feel my pronunciation improved from recording myself reading texts in the foreign language.	SA	A	N	D	SD
4. I enjoyed getting comments from my classmates on my blog.	SA	A	N	D	SD
5. I read my classmates' comments regularly.	SA	A	N	D	SD
6. I would like to continue to work on my pronunciation by recording myself in future foreign language classes.	SA	A	N	D	SD
7. I found the comments from the native speaker grader to be helpful.	SA	A	N	D	SD
8. I found recording and listening to pronunciation to be a useful exercise.	SA	A	N	D	SD
9. Comment on the blog/podcasting assignments this semester? Which ones did you enjoy most and least? Why?					
10. Did you enjoy the pronunciation or the more creative podcasts more? Why?					
11. Did you find the pronunciation or the study abroad podcasts to be more helpful to your learning? Why?					
12. Did you like getting feedback on your pronunciation from a native speaker? Why or why not?					
13. Would you have preferred getting feedback on your pronunciation by your teacher or one of your classmates? Why or why not?					
14. Is there anything you would change about this project?					

Appendix B: Extemporaneous Podcast Grading Rubric**Your Podcast**

5 points – Content		_____
4-5 pts	topic fully discussed with several examples from your experiences and research	
2-3 pts	topic only cursorily discussed with only one example provided	
1 point	topic barely discussed with no examples provided	
5 points – Coherency and Organization		_____
4-5 points	coherent and well-organized, includes title	
2-3 points	somewhat difficult to follow, includes title	
1 point	not organized, no title	
5 points – Pronunciation and Fluency		_____
4-5 points	few errors in pronunciation; conversation flows well	
2-3 points	a fair amount of pronunciation errors, but still comprehensible; many starts and stops in conversation	
1 point	meaning unclear due to pronunciation errors	
5 points – Accuracy		_____
4-5 points	few errors in spelling and grammar	
2-3 points	many spelling or grammar errors, but still comprehensible	
1 point	meaning unclear due to spelling or grammar errors	
5 points – Creativity		_____
4-5 points	creative presentation of topic including music, pictures, background, special effects, and/or energetic presentation	
2-3 points	semi-creative presentation without additional effects	
1 point	completely uncreative presentation	
5 points – Impact		_____
4-5 points	voice is engaging, voice sounds natural, includes natural pauses and hesitations, variation in voice intonation	
2-3 points	voice is not very engaging, little variation in voice intonation, parts of podcasts sounds read aloud	
1 point	voice is not at all engaging, monotone voice, entire podcast sounds read aloud	
Total Points		_____/30

Appendix C: Scripted Podcast Grading Rubric

Grading Rubric for Pronunciation Podcasts

Since everyone's pronunciation strengths are different, you will be graded on completion, improvement, clarity of pronunciation, and successful posting to the blog for a total of 15 points.

Completion (3 pts)

Less than half of text read	1 pt	_____
Almost all of text read	2 pts	
Entire text read	3 pts	

Clarity (3 pts)

Many parts of podcast hard to understand	1 pt	_____
Parts of podcast hard to understand	2 pts	
Entire podcast clear and easy to understand	3 pts	

Improvement (6 pts)

No or only slight improvement from last podcast	1-2 pts	_____
Improvement on one of 2 aspects from last podcast	3-4 pts	
Improvement on both aspects from last podcast	5-6 pts	

Posted to Blog (3 pts)

Not successfully posted to blog	1 pt	_____
Posted late to blog	2 pts	
Successfully posted on time to blog	3 pts	

Total Points _____/15

Your pronunciation goals for next time (self-assessment):

Two aspects of pronunciation you should work on for next time (teacher comments):

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REFERENCES

- Amemiya, S., Hasegawa, K., Kaneko, K., Miyakoda, H., & Tsukahara, W. (2007). Development and evaluation of a foreign-word learning system by iPods. In *Proceedings of the Sixth IASTED International Conference on WEB-Based Education* (pp. 264-269). Chamonix, France.
- Anderson-Hsieh, J. R., & Koehler, K. (1988). The effect of foreign accent and speaking rate on native speaker comprehension. *Language Learning*, 38, 561-593.
- Bongaerts, T., van Summeren, C., Planken, B., & Schils, E. (1997). Age and ultimate attainment in the pronunciation of a foreign language. *Studies in Second Language Acquisition*, 19, 447-465.
- Brennan, E., & Brennan, J. S. (1981). Accent scaling and language attitudes: Reactions to Mexican American English speech. *Language and Speech*, 24(3), 207-221.
- Chan, A., & Lee, M. J. W. (2005). An MP3 a day keeps the worries away: Exploring the use of podcasting to address preconceptions and alleviate pre-class anxiety amongst undergraduate information technology students. In D. H. R. Spennemann & L. Burr (Eds.), *Good practice in practice. Proceedings of the Student Experience Conference* (pp. 59-71). Wagga Wagga, NSW: Charles Sturt University.
- Chun, D. (1988). The Neglected role of intonation in communicative competence and proficiency. *Modern Language Journal*, 72, 295-303.
- Derwing, T., & Munro, M. J. (1997). Accent, intelligibility and comprehensibility: Evidence from four L1s. *Studies in Second Language Acquisition*, 20, 1-16.
- Derwing, T. M., & Rossiter, M. J. (2003). The effects of pronunciation instruction on the accuracy, fluency and complexity of L2 accented speech. *Applied Language Learning*, 13(1), 1-17.
- Diem, R. (2005). Podcasting: A new way to reach students. *The Language Teacher*, 29(8), 45-46.
- Ehsani, F., & Knodt, E. (1998). Speech technology in computer-aided language learning: Strengths and limitations of a new CALL paradigm. *Language Learning & Technology*, 2(1), 45-60. Retrieved from <http://lt.msu.edu>

- Elliott, A.R. (1995). Foreign language phonology: Field independence, attitude, and the success of formal instruction in Spanish pronunciation. *Modern Language Journal*, 79, 530-542.
- Flege, J. E., Frieda, E. M., & Nozawa, T. (1997). Amount of native-language (L1) use affects the pronunciation of an L2. *Journal of Phonetics*, 25, 169-186.
- Flege, J. E., & Munro, M. J. (1994). The word unit in second language speech production and perception. *Studies in Second Language Acquisition*, 16(4), 381-411.
- Godwin-Jones, R. (2005). Skype and podcasting: Disruptive technologies for language learning. *Language Learning and Technology*, 9 (3), 9-12. Retrieved from <http://llt.msu.edu>
- González-Bueno, M. (1997). Voice-onset-time in the perception of foreign accent by native listeners of Spanish. *IRAL*, 35(4), 251-267.
- Graeme, C. (2006). The short and long-term effects of pronunciation instruction. *Prospect*, 21(1), 46-66.
- Hardison, D. (2004). Generalization of computer-assisted prosody training: Quantitative and qualitative findings. *Language Learning & Technology*, 8(1), 34-52. Retrieved from <http://llt.msu.edu>
- Harris Interactive. (2007). *On campus and beyond*. *Trends & Tudes*, 6(6), 1-5. Retrieved from http://www.harrisinteractive.com/news/newsletters/k12news/HI_TrendsTudes_2007_v06_i06.pdf
- Jilka, M. (2000). Testing the contribution of prosody to the perception of foreign accent. *New Sounds*, 4, 199-207.
- Leather, J. (1999). Second-language speech research: An introduction. *Language Learning*, 49(1), 1-56.
- Lee, M. J. W., & Chan, A. (2007). Reducing the effects of isolation and promoting inclusivity for distance learners through podcasting. *Turkish Online Journal of Distance Education*, 8 (1), 85-105. Retrieved from <http://tojde.anadolu.edu.tr>
- Levy, M. (2007). Research and technological innovation in CALL. *Innovation in Language Learning and Teaching*, 1(1), 180-190.
- Lord, G. (2005). (How) can we teach foreign language pronunciation? On the effects of a Spanish phonetics course. *Hispania*, 88(3), 557-567.
- Lord, G. (2008). Podcasting communities and second language pronunciation. *Foreign Language Annals*, 41(2), 364-379.
- Magen, H. (1998). The perception of foreign-accented speech. *Journal of Phonetics*, 26, 381-400.
- Major, R. C. (1987). Phonological similarity, markedness, and rate of L2 acquisition. *Studies in Second Language Acquisition*, 9(1), 63-82.
- Martin, P. (2004). Winpitch LTL II, a multimodal pronunciation software. Paper presented at InSTIL/ICALL 2004 Symposium on Computer Assisted Learning, Venice, Italy. Retrieved from http://www.isca-speech.org/archive/icall2004/iic4_042.html
- McCarty, S. (2005). Spoken Internet to go: Popularization through podcasting. *JALT CALL*, 1(2), 67-74. Retrieved <http://jaltcall.org/news/index.php>
- McQuillan, J. (2006a). Languages on the go: Tuning in to podcasting. *The International Journal of Foreign Language Teaching*, 2(1), 16-18. Retrieved from <http://www.tprstories.com/ijflt>
- McQuillan, J. (2006b). iPod in education: The potential for language acquisition. White Paper. Retrieved http://edcommunity.apple.com/ali/galleryfiles/12071/iPod_Edu_Whitepaper_Language_Aquisition.pdf

- Meng, P. (2005). Podcasting and vodcasting: A white paper. Retrieved from http://edmarketing.apple.com/adcinstitute/wp-content/Missouri_Podcasting_White_Paper.pdf
- Moyer, A. (1999). Ultimate attainment in L2 phonology: The critical factors of age, motivation, and instruction. *Studies in Second Language Acquisition*, 21, 81-108.
- Munro, M. J. (1995). Nonsegmental factors in foreign accent. *Studies in Second Language Acquisition*, 17(1), 17-34.
- Munro, M. J., & Derwing, T. M. (1994). Evaluations of foreign accent in extemporaneous and read material. *Language Testing*, 11(3), 253-266.
- Munro, M. J., & Derwing, T. M. (1995). Processing time, accent, and comprehensibility in the perception of native and foreign-accented speech. *Language and Speech*, 38(3), 289-306.
- Munro, M. J., & Derwing, T. M. (1998). The effects of speaking rate on listener evaluations of native and foreign-accented speech. *Language Learning*, 48(2), 159-182.
- Munro, M. J., & Derwing, T. M. (2001). Modeling perceptions of accentedness and comprehensibility of L2 speech. *Studies in Second Language Acquisition*, 23, 451-468.
- Munro, M. J., & Derwing, T. M. (2007). The functional load principle in ESL pronunciation instruction: An exploratory study. *System*, 34(4), 520-531.
- O'Brien, M. (2004). Pronunciation matters. *Die Unterrichtspraxis*, 37(1), 1-9.
- O'Brien, M. (2006). Teaching pronunciation and intonation with computer technology. In L. Ducate & N. Arnold (Eds.), *Calling on CALL: From Theory and Research to New Directions in Foreign Language Teaching* (pp.1-20). San Marcos, TX: Computer Assisted Language Instruction Consortium.
- O'Bryan, A., & Hegelheimer, V. (2007) Integrating CALL into the classroom: The role of podcasting in an ESL listening strategies course. *ReCALL*, 19(2), 162-180.
- Olson, L., & Samuels, S. J. (1973). The relationship between age and accuracy of foreign language pronunciation. *The Journal of Educational Research*, 66(6), 263-268.
- Oyama, S. (1976). A sensitive period for the acquisition of a nonnative phonological system. *Journal of Psycholinguistic Research*, 5(3), 261-283.
- Pennington, M. C. (1989). Teaching pronunciation from the top down. *RELC Journal*, 20(1), 20-38.
- Pennington, M. C., & Richards, J. C. (1986). Pronunciation revisited. *TESOL Quarterly* 20, 207-25.
- Piper, T., & Cansin, D. (1988). Factors influencing the foreign accent. *The Canadian Modern Language Review*, 44(2), 334-342.
- Rajadurai, J. (2007). Intelligibility studies: A consideration of empirical and ideological issues. *World Englishes*, 26(1), 87-98.
- Ramírez-Verdugo, D. (2006). A study of intonation awareness and learning in non-native speakers of English. *Language Awareness*, 15(3), 141-159.
- Riney, T., & Flege, J. (1998). Changes over time in global foreign accent and liquid identifiability and accuracy. *Studies in Second Language Acquisition*, 20, 213-243.
- Rosell-Aguilar, F. (2007). Top of the pods -- In search of a podcasting "podagogy" for language learning. *Computer Assisted Language Learning*, 20(5), 471-492.

- Rosell-Aguilar, F. (2009). Podcasting for language learning: Re-examining the potential. In L. Lomicka & G. Lord (Eds.), *The Next Generation: Social Networking and Online Collaboration in Foreign Language Learning* (pp. 13-34). San Marcos, TX: CALICO.
- Seferoglu, G. (2005). Improving students' pronunciation through accent reduction software. *British Journal of Educational Technology*, 36(2), 303-316.
- Snow, C. E., & Hoefnagel-Höhle, M. (1977). Age differences in the pronunciation of foreign sounds. *Language and Speech*, 20(4), 357-365.
- Stanley, G. (2006). Podcasting: Audio on the Internet comes of age. *TESL-EJ*, 9(4). Retrieved from <http://www-writing.berkeley.edu:16080/TESL-EJ>
- Stevick, E., Morley, J., & Wallace Robinett, B. (1975). Round robin on the teaching of pronunciation. *TESOL Quarterly*, 9(1), 81-88.
- Swain, M., & Lapkin, S. (1995). Problems in output and the cognitive processes they generate: A step towards second language learning. *Applied Linguistics*, 16, 371-391.
- Tan, Y. H., & Mong, K. T. (n.d.). Audioblogging and podcasting in education. Retrieved from <http://edublog.net/wp>
- Tavales, S., & Skevoulis, S. (2006). Podcasts: Changing the face of e-learning. Retrieved from <http://ww1.ucmss.com/books/LFS/CSREA2006/SER4351.pdf>
- Terrell, T. D. (1989). Teaching Spanish pronunciation in a communicative approach. In P. C. Bjarkmana & R. M. Hammond (Eds.), *American Spanish pronunciation: Theoretical and applied perspectives* (pp. 196-214). Washington, DC: Georgetown University Press.
- Thompson, I. (1991). Foreign accents revisited: The English pronunciation of Russian immigrants. *Language Learning*, 41(2), 177-204.
- Thorne, S. L., & Payne, J. S. (2005). Evolutionary trajectories, internet-mediated expression, and language education. *CALICO Journal*, 22(3), 371-397.
- The University of Wisconsin Language Institute Website. Retrieved from <http://languageinstitute.wisc.edu>
- Van Els, T., & de Bot, K. (1987). The role of intonation in foreign accent. *The Modern Language Journal*, 71(2), 147-155.
- Volle, L. (2005). Analyzing oral skills in voice e-mail and online interviews. *Language Learning & Technology*, 9(3), 146-163. Retrieved from <http://llt.msu.edu>
- Weinberg, A., & Knoerr, H. (2003). Learning French pronunciation: Audiocassettes or multimedia? *CALICO Journal*, 20(2), 315-336.
- Young, D. J. (2007). iPods, MP3 players and podcasts for FL learning: Current practices and future considerations. *NECTFL Review*, 60, 39-49.