

Copyright

by

Steven Andrew Kroman

2014

**The Report Committee for Steven Andrew Kroman
Certifies that this is the approved version of the following report:**

**Making Sense of Speech: A Practical Approach to
Pronunciation Assessment**

**APPROVED BY
SUPERVISING COMMITTEE:**

Thomas J. Garza, Supervisor

Elaine K. Horwitz

Veronica G. Sardegna

**Making Sense of Speech: A Practical Approach to
Pronunciation Assessment**

by

Steven Andrew Kroman, B. A.

Report

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Arts

The University of Texas at Austin

December 2014

Acknowledgements

I would like to thank Dr. Sardegna for providing me inspiration and opportunity to discover and pursue my interests, and a lot of support despite great distance. I would also like to thank Dr. Garza for always encouraging me to write even when morale was low and my progress on this report was lacking. Your encouragement has made writing this report into a positive experience.

December 2014

Abstract

Making Sense of Speech: A Practical Approach to Pronunciation Assessment

Steven Andrew Kroman, M.A.

University of Texas at Austin, 2014

Supervisor: Thomas J. Garza

Recent research has shifted the focus of pronunciation instruction from achieving native-like speech in learners to correcting issues that affect the intelligibility of the learners' speech. Research also suggests that suprasegmental features of pronunciation, such as intonation, rhythm, and stress, have a considerable influence on intelligibility. By using Dickerson's (1989) Covert Rehearsal Model, which includes predictive strategies that encourage learner autonomy, instructors have the tools necessary to effectively help learners improve their intelligibility. However, the question as to which instructional targets should be taught in the classroom still remains. This report outlines one way in which instructors can use a diagnostic assessment in order to discover which instructional targets are most appropriate for their learners.

Table of Contents

List of Figures.....	vii
I. INTRODUCTION.....	1
II. DEVELOPMENT OF PRONUNCIATION INSTRUCTION.....	4
Pronunciation Instruction in the Past.....	4
Nativeness Principle	6
Accentedness, Comprehensibility, and Intelligibility.....	9
Intelligibility Principle.....	10
Focus on Suprasegmentals.....	12
III. PRONUNCIATION INSTRUCTIONAL MODELS.....	15
Why Teach Pronunciation?.....	15
Instructional Framework.....	17
The Covert Rehearsal Model.....	20
IV. PRONUNCIATION ASSESSMENT,.....	24
Potential Targets.....	24
Selecting and Creating Materials.....	26
Assessing Speech.....	31
Selecting Instructional Targets.....	32
V. CONCLUSION	36
BIBLIOGRAPHY	38

List of Figures

Figure 1. Words in isolation sample.....	26
Figure 2. Free Speech Sample.....	28
Figure 3. Sample diagnostic reading passage.. ..	28
Figure 4. Voiced and voiceless bilabial and labiodentals marked.....	29
Figure 5. Primary stress and intonation added to the assessment.....	30
Figure 6. Different targets marked on the same assessment.....	31

I. Introduction

One of the most important topics of language learning that is often overlooked in the classroom is pronunciation instruction. Despite the large amount of language anxiety experienced by students who are uncomfortable with their speech in a foreign language (Baran-Łucarz, 2011; Shams, 2005), pronunciation is often not included in the language curriculum. Additionally, it has been reported that a large percentage of English as a Second Language (ESL) teachers do not receive any sort of pronunciation training (Breitkreutz, Derwing, & Rossiter, 2001; Murphy, 2014) and an overwhelming majority of surveyed ESL learners in the United States have never received any sort of pronunciation instruction (Derwing & Rossiter, 2002).

The neglect of pronunciation instruction started with the rise in popularity of the Communicative Language Teaching (CLT) approach, which caused many instructors to abandon traditional pronunciation instructional methodologies that primarily consisted of massive quantities of repetition exercises, such as minimal pair drills and listen-and-repeat tasks. These methodologies seemed to provide very little practical results for more communicatively focused speaking curriculums (Murphy, 1991). The result of this movement led to a considerable decline in pronunciation instruction, and consequently, pronunciation research

became a rarity in most academic journals (Jenkins, 2004; Munro & Derwing, 2005).

Pronunciation instruction started to make a comeback as instructors and researchers realized the importance of suprasegmental speech features, such as intonation, stress, and rhythm, and the role of pronunciation in successful communication. As argued by Jones (1997), learners' speech needed to be understood by native speakers for them to have successful communications. At the same time, research into the critical period for language acquisition forced instructors to abandon older notions of pronunciation instruction goals for ones that were more based on realistic possibilities (Birdsong & Molis, 2001).

The Intelligibility Principle defined by Levis (2005), laid the groundwork for the development of pronunciation instructional models that strayed from the idea of accent reduction and instead aimed at improving features of learners' speech that impeded their ability to be understood by native speakers. Morley (1991) developed an instructional framework that worked to increase learner autonomy, encouraging learners to be responsible for the development of their own speech. This framework placed pronunciation instructors in the role of a "coach" offering learners perception and production strategies, feedback, and error correction. Dickerson (1994) activated Morley's framework by adding in a crucial component, the predictive rules necessary for learners to be able to monitor and correct their own speech. Armed and empowered with these predictive strategies, Dickerson

(1989, 2000) encourages learners to utilize covert rehearsal, or private practice, in order to modify their own speech to match the pronunciation models they have obtained.

However, depending on the learners' backgrounds or their specific speech issues, they may require different pronunciation strategies to improve the comprehensibility and intelligibility of their specific speech. While the Likert scale has been a popular tool for assessing learners' pronunciation in terms of their accentedness, it does not do any more than judge the learners' degree of accent leaving us with little information about the learners' speech. In this Report, a diagnostic assessment should be employed. The diagnostic assessment should focus on capturing specific issues in the learners' speech by isolating potential segmental and suprasegmental targets and finding if the learners are able to predict or articulate those targets correctly. Students' scores on this assessment tool can then be used to develop a curriculum that best helps learners improve the particular targets that impede their ability to be understood.

II. Development of Pronunciation Instruction

PRONUNCIATION INSTRUCTION IN THE PAST

Attitudes towards pronunciation instruction have changed drastically over the past sixty years. Traditionally, audiolingual methods in the US and the oral approach in Britain incorporated pronunciation instruction in their curricula as one of many forms of language that must be taught, with nearly the same emphasis as the teaching of grammatical forms. In this type of methodology, grammatical accuracy as well as pronunciation accuracy was a high priority goal (Morley, 1991). These pronunciation instructional methodologies were almost completely composed of listen and repeat exercises, but also included visual transcriptions, such as dictation, and minimal pair drills, which are exercises that use words that differ by only a single sound (Celce-Murcia, Brinton, & Goodwin, 2010). Given the widespread use of the audiolingual methodology in ESL classrooms, pronunciation instruction could be said to have been flourished during this time. However, the advent of Terrell's Natural approach, which claims that pronunciation instruction only serves to improve the learners' ability to monitor their own speech, and yields no actual language acquisition cause instructors to question whether pronunciation instruction was necessary. Another methodology that was gaining popularity and remains a popular approach today, the Communicative Language Teaching (CLT) approach, emphasized oral fluency and discouraged error correction, making traditional

pronunciation exercises such as listen and repeat tasks obsolete, resulting in the abandonment of pronunciation instruction. CLT supporters claim that pronunciation skills would improve naturally as learners have opportunities to converse with native speakers and other English learners (Murphy, 1991).

After a considerable period in which pronunciation instruction was almost forgotten, CLT proponents began to realize the importance of pronunciation's role in communicative competence. This change was mainly brought about by the discovery of the key role of suprasegmental speech features for communication (Jones, 1997). From the 1970s, communicative English courses began to re-incorporate pronunciation as an instructional component only where it was helpful in terms of improving communication. However, currently, there has been considerable interest in discovering better ways to incorporate pronunciation instruction into the oral communication curriculum (see suggestions in Sardegna, Fu-Hao, & Gosh, in press). Levis and Grant (2003) cover some of the challenges faced by instructors attempting to incorporate pronunciation instruction in an oral communication course setting. They point out that, in addition to a lack of speaking oriented pronunciation activities, instruction often fails to find the right balance of structured and less restrictive activities tending to overemphasize either one or the other. Along with some example activities that can be used for pronunciation practice, Levis and Grant propose a set of principles for instructors to follow that include (a) a focus on

suprasegmentals, (b) a focus on speaking, and (c) the concept that instruction should fit the task.

The realization of pronunciation's importance in communication, coupled with a considerable effort to include pronunciation in modern ESL classrooms that aim to improve communicative competence, has fueled the resurgence of pronunciation in the language education discourse. The result of this realization is a shift from the debate about whether or not pronunciation should be taught, to a focus on how pronunciation should be taught; which activities are ideal for improving learners' ability to communicate clearly, and what constitutes an ideal instructional balance between pronunciation exercises and other communicative activities.

THE NATIVENESS PRINCIPLE

One key issue in the development of pronunciation instructional strategies and materials has been a problematic focus on training learners to adopt native or near native-like pronunciation. Levis (2005) calls this the nativeness principle and suggests that both instructors and learners often establish the unrealistic goal of attaining native-like pronunciation as the primary objective of the pronunciation curriculum. As discussed in the preceding sections, this instructional goal resulted in pronunciation activities that focused on the explanation and memorization of patterns, drills, and dialogues (Celce-Murcia et

al., 2010; Morely, 1991). Additionally, even now, many learners believe that achieving native-like pronunciation is an important outcome of ESL education. In a survey done with ESL learners in Canada, Derwing (2003) found that just over 50% of the learners attributed communication problems to pronunciation, but almost 95% of students wished to achieve native-like pronunciation proficiency. Despite being aware that they can be understood without native-like pronunciation, learners still wanted to sound like native speakers.

Unfortunately for language learners who cling to this unrealistic expectation of achieving native-like speech, there is quite a lot of evidence that suggests the likelihood of achieving native-like pronunciation proficiency in a second language is quite slim after a certain age. Early evidence of this critical period was found in a study by Johnson and Newport (1989). The study measured the language acquisition of Korean and Chinese immigrants with different ages of arrival and found that test performance had a negative linear correlation with age until maturation where performance began to vary.

Birdsong and Molis' (2001) replication of Johnson and Newport's study with Spanish speakers corroborated this evidence, but additionally found that while learners with an earlier age of arrival (to the United States) tended to have better test scores, performance dramatically declined up until maturation, whereas later learners had a shallower negative correlation suggesting that after maturation, the ability to improve declines at a much slower rate. Coupled with evidence of

native-like attainment in even later learners, Birdsong and Molis' data suggests that while it is considerably less likely that later learners will achieve native-like proficiency in a language, it is not a wholly impossible task, and does not change considerably over time after maturation. Further investigation into the critical period hypothesis has revealed that the critical age and the likelihood of native-like attainment for different linguistic abilities, such as pronunciation, may vary. Flege, Yeni-Komshian, and Liu (1999) explored English proficiency differences in a variety of ages and ages of arrival to the United States of Korean immigrants and found results similar to those of Birdsong and Molis in the area of accentedness; learners who arrived later in life, tended to have stronger accents. Piske, MacKay, and Flege, (2001) found evidence that age of arrival is a primary factor in determining accentedness of speech, but also corroborated the idea that there are other factors that affect the learner's ability to speak like a native speaker.

All of the aforementioned studies suggest that while not entirely impossible, the idea of achieving native-like pronunciation in a second language is unlikely, extremely difficult, and often requires a lot of effort and motivation. Pronunciation curricula that actively follow the nativeness principle and use unrealistic goals to guide pronunciation instruction are likely to leave those students with high expectations disappointed in their progress.

ACCENTEDNESS, COMPREHENSIBILITY, AND INTELLIGIBILITY

Munro and Derwing (2009) define accentedness as “how different a pattern of speech sounds compared to the local variety” (p. 479) and comprehensibility as how easy it is for a listener to understand speech or how much effort it takes to process speech. Quite different from comprehensibility, intelligibility is a measure of how much the listener actually understands.

Examination into the relationships among accentedness, comprehensibility, and intelligibility of speech has revealed that while a heavy accent may potentially cause issues in communication, it is not necessarily a deterring factor in intelligibility. In contrast, poor intelligibility is almost always caused by a heavy accent (Munro & Derwing, 1999; 2009). Munro and Derwing (1997) had native speakers of English rate speech samples of language learners from four backgrounds for accentedness, comprehensibility, intelligibility, and a variety of individual learner factors. They found that while heavy accents did not necessarily imply poor comprehensibility in speech samples, accentedness was even less of a factor in the intelligibility of the learners’ speech. Some of the speech samples consisted of speech with considerably good intelligibility that was rated as being difficult to understand and heavily accented. Other factors such as grammar, speaking rate, and fluency also played a large role. Trofimovich and Isaacs (2012) found similar results to Munro and Derwing when looking at speech samples scored by novice raters and experienced teachers.

Both of these studies also found that it is not necessarily overall accent that negatively affects the comprehensibility of learners, but rather specific features of pronunciation, such as using incorrect segmental pronunciation and the unexpected placement of stress, that made their speech difficult to understand.

INTELLIGIBILITY PRINCIPLE

The discovery that accented speech is not the sole cause of or even a major concern when it comes to the comprehensibility and intelligibility of learners' speech has created an opportunity and a reason for pronunciation instruction to take a turn away from unrealistic expectations of curricula that follow the nativeness principle and instead seek to improve the areas of pronunciation that have the greatest effect on the comprehensibility and intelligibility of the learner. The intelligibility principle (Levis, 2005) informs instruction that provides students with realistic goals and structured curriculum that target specific aspects of pronunciation with which learners are struggling. The growing adoption of the intelligibility principle has shifted development of pronunciation instruction from whether or not pronunciation is actually useful in helping learners' speak more like native speakers, into a discussion about which pronunciation issues are most important and have greater implications for the intelligibility of the learner.

Another belief that supports the incorporation of the intelligibility principle and rejection of the nativeness principle is the simple fact that not all English

language learners prefer to lose their accents. Ladegaard and Sachdev (2008) found that EFL students in Denmark preferred a British English accent to a standard American one despite having a greater interest in American culture. Gatbonton, Trofimovich, and Magid (2005), studied how native French and native Chinese English language learners perceived speech accentedness in relation to loyalty to their respective first language (L1) communities, and found that students with higher pronunciation accuracy were perceived to be less loyal to their L1 community. This study suggests that students' fear of losing their L1 identity may provide an insight as to what might hinder learners' "ability" to achieve native-like speaking proficiency.

Guided by the worldwide trend towards globalization and the emergence of English as a *lingua franca*—i.e., the language used by people of different backgrounds and cultures for communication in business and other fields—, Jenkins (2002) designed a curriculum, the Lingua Franca Core, based on the Intelligibility principle that focused on what she believed to be key pronunciation issues that contributed to communication breakdowns between non-native speakers. Her English as an International Language (EIL) courses focused on (a) changing the students' consonant inventory, (b) learning the additional phonetic requirements, (c) practicing consonant clusters, (d) improving vowel sounds, and (e) producing phrasal stress. Despite being a considerable step in the right direction from nativeness -based curricula to intelligibility-based curricula,

The Lingua Franca Core has been criticized by scholars, such as Dauer (2004), for its lack of focus on suprasegmental features and overemphasis of segmental features.

FOCUS ON SUPRASEGMENTALS

Traditionally, segmental issues, such as learning the proper articulation of vowel and consonant sounds, have been the central focus of pronunciation instruction, but the emergence of more modern language acquisition theories, the realization of the role of prosody in intelligible speech, and a great lack of empirical data (Derwing et al, 2012) have provoked scholars to look more closely at suprasegmental features. Hahn (2004) conducted a study in which native speakers were required to listen to a lecture given by an international teaching assistant. This lecture was recorded three times: one in which correct primary stresses were used throughout the lecture, another in which the primary stresses were misplaced, and a third in which there was no audible primary stress.

Ninety students who were native speakers of English were divided into three groups, one for each type of lecture, and tested on how difficult it was to process the lecturer's speech, how much of the lecture they comprehended, and their reaction to the lectures. Hahn found that the correct use of primary stress had a significant effect on the students' ability to understand the lecture.

Kang (2010) studied the acoustic speech features—pause duration, speaking rate, phrasal stress, and intonation—of several International Teaching Assistants (ITAs) using native speakers to rate their accentedness and comprehensibility. In terms of comprehensibility, Kang found that speaking rate played a considerable role in how easy ITA's speech was comprehended; ITAs with faster speaking rates were more comprehensible to the raters. Kang concluded that increasing rate of speaking would be beneficial for ITAs undergoing language training and added that “pausing is not deleterious in itself, but it is important to pause at discourse junctures” (p. 312). This conclusion is in line with what Munro and Derwing (2001) found when their raters judged accelerated non-native speech more comprehensible and less accented up to a certain point. These studies show that features such speaking rate and pausing also play a large role in speech intelligibility.

Additionally, Field (2005) found that misplaced stress within words had a considerable negative effect on intelligibility. Although his results were weakened due to his procedure being limited to only using words in isolation, he maintains that incorrect word stress may play an even bigger role in free speech. Zielinski's (2008) study also found that word level features often caused intelligibility issues for native speakers listening to non-native speech. Derwing et al. (2012) discovered that some aspects of pronunciation improved over time without implicit instruction, whereas others did not, concluding that certain

features of pronunciation that do not improve naturally, such as word stress and contractions are important targets for classroom instruction.

Despite these studies, there is still a lack of empirical data pointing pronunciation teachers in the right direction as far as which components of pronunciation should be taught (Derwing et al., 2012). However, there is substantial evidence that points to the importance of suprasegmentals in intelligible speech and their effect on comprehensibility (Anderson-Hsieh & Koehler, 1988; Anderson- Hsieh, Johnson, & Koehler, 1992; Derwing, Munro, & Wiebe, 1998). These studies all emphasize the importance of including and emphasizing suprasegmental features in any pronunciation curriculum that strives to improve speech intelligibility.

III. Pronunciation Instructional Models

WHY TEACH PRONUNCIATION?

The question still remains: Why teach pronunciation at all? In fact, many teachers are wary of teaching pronunciation for fear of revealing a lack of knowledge in the subject area to their students (Gilbert, 2012). In fact, it has been reported that many in-service and pre-service teachers receive little or no pronunciation training whatsoever (Breitkreutz, Derwing, & Rossiter, 2001; Murphy, 2014). For untrained teachers, including pronunciation in the curriculum seems like a daunting task, especially since results are slow and require a considerable amount of time in and out of class dedicated to speech monitoring and practice. Yet, there are still many reasons that pronunciation should not be ignored and actually be considered a critical part of teaching language learners.

Despite how some teachers feel about pronunciation and the difficulty for adult learners to improve theirs, many experts say that pronunciation can indeed be taught (Celce-Murcia et al., 2010; Gilbert, 2012); further, with practice and time, even adult learners can improve the clarity and intelligibility of their speech (Sardegna, 2009, 2011, 2012; Sardegna & McGregor, 2013). In addition to improving speech clarity to aid in communication, improvements in pronunciation can help decrease language speaking anxiety.

Pronunciation, in fact, can be one of the largest contributors to language anxiety, as it has the potential to invoke many types of anxiety simultaneously (Horwitz et al., 1986). Baran-Łucarz (2011) discovered a correlation between language anxiety, perceived pronunciation, and actual pronunciation in language learners. Using a pronunciation test that looked at certain sounds and word stress, a survey to measure perceived pronunciation, and the Foreign Language Classroom Anxiety Scale (see Horwitz et al., 1986), she found that learners with lower pronunciation scores had higher levels of language anxiety. This effect was even stronger in the learners' perceived pronunciation. Although her study faced some serious limitations, it does provide some empirical support for using pronunciation instruction as a tool for lowering language anxiety and improving learners' willingness to speak. There is also evidence that pronunciation instruction, regardless of methodology, and the improvement of perceived pronunciation can lead to decreases in foreign language anxiety (Shams, 2005).

Considering the link between pronunciation and anxiety, it would seem that including pronunciation instruction in the general foreign language curriculum and, thus, lowering the foreign language anxiety of learners, might even lead to greater gains in other language skills over time, as well as help create more motivated language learners. As long as appropriate goals are set for the outcomes of pronunciation instruction, the benefits of its inclusion should not be overlooked.

Finally, there are several considerations when selecting a methodology for pronunciation instruction. Increasing speech clarity and intelligibility should be a priority for instruction, while moving away from the idea of native-like pronunciation. Retention of the learners' home accent should be something that is praised, while at the same time instruction should focus on training learners to fix specific parts of the accent that impede the learners' ability to communicate. With this in mind, activities such as general listen-and-repeat exercises should be abandoned in favor of activities that target certain segmental or suprasegmental issues that the learner is having. Rather than striving for perfection, learners should be taught to feel more comfortable with their own speech by correcting these issues and embracing their own accents.

INSTRUCTIONAL FRAMEWORK

Morley (1991) recognized that ESL/EFL instruction was undergoing a paradigm shift from teacher-centered practices that viewed students as recipients of a formal linguistic system, to student-centered communicative lessons which posed students as creators of a linguistic system used primarily for communication. By focusing on students' learning, Morley created a model that aims to set realistic learning goals along with a primary focus on improving speech clarity and intelligibility. Morley suggests that these goals can be achieved through a number of practices: (a) teaching learner autonomy, (b)

creating a supportive classroom atmosphere, (c) incorporating a combination of speech, listening, and spelling practices, (d) improving learner awareness and attitude, (e) setting the role of the instructor as a “speech coach,” and (f) adequate planning.

Morley states that pronunciation instruction is most effective when “learners are actively involved in their own learning” (503). It is the teacher’s duty to encourage students to be autonomous in their own language learning. In order to support autonomy in learners, it is important for teachers to convey to students that they are almost wholly responsible for their learning and improvement. With the teacher’s aid, students can and should develop self-monitoring and speech modification skills. Error correction cannot be seen as a “bad thing,” but rather an opportunity for improvement, and students must also be made aware of their own improvements over time, as gradual improvements can often be difficult to perceive.

A variety of practices that aim at improving speech production, listening discrimination, and helping relate orthographic nuances to pronunciation should be given in an atmosphere, where the interactions between teacher and student as well as among students should be positive and encouraging. Keeping this in mind, the teacher should strive for a more student-centered atmosphere where the teacher provides suggestions for improvement and error correction without

controlling the classroom. A balance of controlled and free-form exercises is needed in order to give students the opportunity to practice in different situations.

Lastly, class planning that focuses on increasing learner speech intelligibility, as well as facilitating learner autonomy, should include “conducting pronunciation/speech diagnostic analyses, and choosing and prioritizing those features that will make the most noticeable impact on modifying the speech of each learner towards increased intelligibility” (Morley, 1991, p. 508). Once the learners develop the correct strategies to improve the specific parts of their speech that impede their personal intelligibility, they can work to improve their pronunciation autonomously without additional help from the instructor. In fact, prioritization of pronunciation goals based on learners’ needs is one of the main principles of Sardegna and McGregor’s (2012) pedagogical framework. The two other principles that these scholars claim to be integral for successful pronunciation instruction are (a) learner empowerment with explicit instruction, guided practice and strategy use; and (b) opportunities for learners to monitor their performance during their practice, and reflect on their outcomes (see empirical support for this framework in Sardegna & McGregor, 2013). The next section discusses how teachers can empower learners through the covert rehearsal model.

THE COVERT REHEARSAL MODEL

Dickerson's (1989; 1994; 2000) Covert Rehearsal Model provides a guiding framework for integrating pronunciation instruction. While Morley (1991) has established a foundational framework for which pronunciation instructors should model their practice, her framework falls short of describing how learner autonomy can be fostered in the realm of pronunciation instruction. With the Covert Rehearsal Model, Dickerson (1994) solves this issue by expanding Morley's suggestion of using listening (perception), and speaking (production) exercises, by also incorporating the teaching of prediction skills. Prediction skills include learning the phonological rules and patterns of a language, such as those that guide the way words are stressed and pronounced, in order for students to be able to predict how new words should be pronounced when they encounter them. Dickerson claims that awareness of these rules "empowers" students to continue to practice and improve their pronunciation even after the class has ended.

These prediction rules are generally derived from extensive research into the phonological patterns of language. For English specifically, this research has been continuing for decades (Dickerson, 2011). For example, Prator (1951) and Halliday (1967) established rules for discourse stress, which continued to be developed well into the 1980s (cited in Hahn & Dickerson, 1999). Rules for intonation, rhythm, and reduction were also developed over many decades.

Word stress, however, has been explored more recently by scholars such as Guirre (1984) and Dickerson (1989, 2004). Still, regarding the rules to be used to teach pronunciation to learners, Dickerson (2011) notes that most of them fail to uphold to the principle of “No-Prior-Knowledge Assumption” (NPKA) (Dickerson, 1983), which claims that “learner rules must not require the learner to already know the target language (e.g., the meaning or pronunciation of words) or to have specialist knowledge about the target language (e.g., word etymology)” (Dickerson, 2011). Dickerson (1990) established guidelines for developing good learner rules by claiming that they must:

1. adhere to the No-Prior-Knowledge Assumption.
2. apply unambiguously; the trigger implicating it is well-defined.
3. operate mechanically; its output must not rely on guessing.
4. yield a single, unitary output, except where acceptable variation exists.
5. generate a pronounceable output in one pass; cyclic rules are too burdensome.
6. be productive; a rule for a handful of words is not worth the bother.
7. be accurate; the larger the word group, the higher the predictive accuracy should be because of the exceptions to be learned. Common exceptions must be listed.
8. be memorable; it must be brief, simple, template-like for segmentals, and in a form that can be practiced easily (Dickerson, 2011, p. 4).

While critics would claim that teaching these rules hold no place in the communicative language classroom, Dickerson asserts that the rules meant to empower students should be practiced and internalized in private rather than in the classroom. Following in line with that idea, the core components of the Covert Rehearsal Model for practicing all three skills, perception, production, and prediction, are outlined in Dickerson (2000):

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

Through using the Covert Rehearsal Model to teach stress and connected speech feature strategies to learners, Sardegna (2009, 2011, 2012) found that students made considerable improvement in their pronunciation accuracy, and even with a small drop in accuracy months after the course ended. In the long run, students retained much of their pronunciation improvements.

When implementing pronunciation instruction into the curriculum, it is important to establish which targets are to be taught. Most instructors will find

that there is no time to teach the vast quantities of rules that make up the entire English phonological system in any given course and depending on the student's level or background, many of the rules may be intuitive or have already been acquired through other means. Therefore, on top of understanding the students' own beliefs, background knowledge, and goals, instructors must attempt to establish appropriate instructional targets and goals (Sardegna & McGregor, 2012). According to Hedge (2001), a diagnostic assessment where the learners' speech is collected and analyzed, especially in a multilingual classroom, can help us classify and select instructional targets.

IV. Pronunciation Assessment

POTENTIAL TARGETS

There are a few considerations to make before creating diagnostic materials to be used to assess the learners' pronunciation. What are the goals of the class and what are the levels and the goals of the learners? Is the class of a single L1 background or are students mixed? What features of pronunciation are relevant to the learners? Answering these questions will help when making the decision as to what specific aspects of pronunciation should be tested. Understanding the goals of the learners and the class will help in creating the materials for assessment. Knowing students' backgrounds will aid in predicting which characteristics of pronunciation are likely affected by negative language transfer.

When considering segmental features of English, ensuring that the targets to be considered will actually lead to improvement in pronunciation is essential. Functional load refers to how important certain sound contrasts are when determining meaning. Functional load is usually determined by seeing how often the phonemic contrast occurs per thousand words of text (Catford, 1987, as cited in Celce-Murcia et al., 2010). Certain targets such as the difference between /l/ and /r/ have a higher relative functional load (RFL) than other targets such as /θ/ and /ð/ and are therefore higher priority targets (see Celce-Murcia et al., 2010). However, functional load alone should not be the determining factor

as to whether specific sounds should be included in a curriculum. It is important to consider whether or not the student already has the ability to distinguish and produce those sounds.

Functional load is not as clear when it comes to suprasegmental targets, however, from the discussion above we can glean that including suprasegmental targets is imperative when creating an intelligibility based pronunciation curriculum. This also means that we must assess students' current ability to incorporate suprasegmentals in their speech. That is, intonation, phrasal stress, connected speech features, and word stress should all be included in our assessment in order to determine which features would benefit students the most. In fact, once having determined the importance of suprasegmentals in intelligibility, our assessment should be focused on determining a student's ability to produce these features.

When designing the pronunciation assessment materials, it is crucial to consider the language backgrounds of the students in the class. It is somewhat easier to predict potential instructional targets in class with a homogeneous background, whereas a heterogeneous class would have a broader spread of potential targets. Despite this consideration, unless the instructor has an extensive understanding of the phonological linguistics of their learner's first language, it may be difficult to tailor the assessment to the students' first language or languages. In creating our assessment for a class with either

homogeneous or heterogeneous backgrounds, we should therefore include a broad scope of potential targets, but at the same time limit those targets to those with high functional load, relevance to the student's background, and to suprasegmentals.

SELECTING AND CREATING MATERIAL

In order to discover the targets appropriate for a specific group of learners, an assessment that aims at discovering aspects of the learner's speech that impede intelligibility must be constructed. In order to capture the learners' speech habits, this assessment should be made up of three parts: a reading assessment, a free speech assessment, and a list of words in isolation. The reading and the free speech assessments are necessary as they can be used to "complement each other and assist the teacher in confirming the extent to which learners require instruction in a particular area of spoken production" (Celce-Murcia et al., 2010).

Diagnostic Assessment			
Read the following words twice each.			
1. alliance	2. revealing	3. concentrate	4. anonymous
5. traditional	6. variable	7. fallible	8. technology

Figure 1. Words in isolation sample.

The list of words in isolation (Figure 1) is used in order to determine whether the learner can pronounce words with proper stress and correct vowel quality in those stressed syllables. The words chosen for the list should be unusual polysyllabic words that encompass all of the four stress rules outlined in Dickerson (2004). As mentioned above, word stress plays a large role in learner speech intelligibility and language anxiety, so by using this type of list, we can determine whether or not learners are capable of predicting where stress is placed in unfamiliar words, and not avoid incorrectly assuming they understand these patterns by eliciting words that they have learned by repetition.

The free speech sample (Figure 2) enables the measurement of spontaneous speech. It gives us a natural sample of the learners' speech when he or she is more focused on meaning rather than in accurate pronunciation. The free speech sample is particularly useful for reassessing errors gleaned from the reading portion of the assessment. As Celce-Murcia et al. (2010) suggest, learners should be asked about a familiar topic so that they do not feel unnecessarily anxious in answering the question.

The backbone of this assessment is the reading portion (Figure 3). It is in this reading that specific targets can be isolated to determine whether the student is capable of predicting, perceiving, and producing those targets. The reading passage selected to be used as an assessment should contain samples of most of the possible segmental and suprasegmental targets in order to identify

those that the learner cannot accurately articulate. In addition to being appropriate to the learners' language proficiency the reading should be representative of the context in which the learner will be using the language; business English learners, for example, should read something that uses language common in a commercial setting (Celce-Murcia et al., 2010).

<p style="text-align: center;">Diagnostic Assessment</p> <p>Free Speech. Answer the following questions.</p> <ol style="list-style-type: none">1. Where are you from? What is your major? What do you do for fun?2. What do you enjoy about learning English?3. What are some of the problems you face while studying English?

Figure 2. Free speech sample.

<p style="text-align: center;">Diagnostic Assessment</p> <p>Read the following passage.</p> <p>Don't you love birthdays? Well, yesterday was my friend's birthday. We had planned a big surprise party with cake, ice cream, balloons, and games. I brought vanilla ice cream and my sister, Sofia, brought chocolate ice cream. We were all ready to go, but it seems the weather was not willing to play along. Why does it always rain when I try to have a party? Despite the repeated rumbling of thunder, we were determined to have a grandiose celebration...</p>

Figure 3. Sample diagnostic reading passage

While the learners will use this reading passage as is, in order to discover targets for instruction, the instructor must find the potential targets within the passage. In order to use the diagnostic assessment, it must be marked for

potential pronunciation targets. For example, voiced and voiceless bilabial and labiodental targets in word initial and word medial positions /b/, /p/, /f/ and /v/ can be marked as grading targets on the grader copy of the diagnostic assessment (Figure 4). Instances of these targets in the passage can be highlighted so that when listening to the learners' speech, the instructor can mark whether that specific sound was correctly articulated or not. Note that in any specific word; only one segmental target has been highlighted. While it is possible to mark many targets in any given word, it is easier on the grader if targets are more evenly spread out (Sardegna, 2011). Other speech features, such as suprasegmentals, should also be marked for assessment (Figure 5).

Diagnostic Assessment			
/v/	<input type="checkbox"/>	<input type="checkbox"/>	/b/
Don't you love birth days? Well, yesterday was my f riend's birthday. We had			
<input type="checkbox"/>	/p/	<input type="checkbox"/>	/p/
p lanned a big s ur p rise party with cake, ice cream, b alloons, and games. I brought			
<input type="checkbox"/>	/v/	<input type="checkbox"/>	/f/
v anilla ice cream and my sister, S ofia, brought chocolate ice cream. We were all			
			<input type="checkbox"/>
			/p/
ready to go, but it seems the weather was not willing to p lay along. Why does it			
<input type="checkbox"/>		/v/	
		<input type="checkbox"/>	/p/
		<input type="checkbox"/>	/b/
always rain when I try to have a party? Despite the r epeated r um b ling of thunder,			
			<input type="checkbox"/>
			/b/
we were determined to have a grandiose c ele b ration...			

Figure 4. Voiced and voiceless bilabial and labiodentals marked

Diagnostic Assessment

☐ /v/ ☐ ☐ /b/ ☐ [l] ☐ [c]
 Don't you love **birth**days? Well, yesterday was my **f**riend's birthday. We had
☐ Y/N Q ☐ Par

☐ /p/ ☐ /p/ ☐ [c] ☐ [cs] /b/ ☐ ☐ [c] ☐ [c]
planned a big **s**ur**p**rise party with **c**ake, ice cream, **b**alloons, and **g**ames. I brought
☐ List

☐ /v/ ☐ [c] ☐ /f/ ☐ [c]
vanilla ice cream and my sister, **S**ofia, brought chocolate ice cream. We were all
☐ Par

☐ /p/ ☐ [l] ☐ [c]
 ready to go, but it seems the weather was not willing to **p**lay along. Why does it

☐ /v/ ☐ /p/ ☐ /p/
 always rain when I try to **h**ave a party? Despite the **r**epeated **r**um**b**ling of thunder,
☐ RQ ☐ non-F

☐ /b/ ☐ ☐ [l] ☐ [c]
 we were determined to have a grandiose cele**b**ration...

Figure 5. Primary stress and intonation added to the assessment

As more and more targets are added, the assessment instrument may become rather crowded, as it would be difficult to identify all of the potential targets without using the same word or phrase more than once. Crowded assessments will become difficult to use as often the same word or phrase will be used to identify multiple targets. In order to remedy this issue, multiple assessment tools can be created that highlight different targets (Figure 6). For example, the voiced and voiceless velar stops /g/ and /k/, and the velar nasal /ŋ/ can be marked on a different copy of the grader copy of the assessment. Creating multiple iterations allows for a shorter passage that may not be as taxing on the learners or the rater. Another suggestion is separating iterations

their speech patterns, such as “practicing [the] diagnostic passage in advance allows the learners to avoid some of the unnatural reading features that might otherwise occur” (Celce-Murcia et al., 2010, p. 313).

The assessment should take place in a low anxiety environment so that learners are as relaxed as possible when reading the passage and the list of words in isolation as well as when they are speaking freely. While it is feasible for the assessment to be done at home and be recorded by the learner, there is the possibility that the learner will attempt to look up unknown words and change their pronunciations, which could skew the results of the assessment, especially with regard to segmental features. Of course, instructors must use a setting that befits their institutional environments, but a quiet place with little noise interference and where the learner cannot be overheard by his or her peers is recommended. The instructor should obtain a sound recording of the three assessments, which can be used together to identify the learners’ pronunciation problem areas.

SELECTING INSTRUCTIONAL TARGETS

Once the assessment has been recorded, the instructor should take the time to listen to the recording carefully along with the assessment instrument in order to pick out the targets to be included in the curriculum. As the instructor listens to the recording, items should be marked as incorrect whenever the

learner mispronounces the target selected in the assessment. In order to get the correct results from the assessment, the target should be marked based on whether the specific segmental or suprasegmental feature was pronounced incorrectly and on whether the word or phrase was understandable, as errors may impede intelligibility differently in different words and phrases.

Pronunciation errors are not perfectly dichotomous (especially when concerned with individual segments), and it is probable over the course of grading the assessment that there will be some difficulty in determining whether the target was pronounced incorrectly. Whether the rater decides to mark the target as incorrect or not, the rater should try to remain consistent in marking close targets throughout the assessment. If they exist, any iterations of the assessment (with different targets) should be listened to and marked in order to find errors in as many targets as possible.

Once the assessments have been evaluated, the data can be used to select primary topics for instruction either on an individual basis or for the classroom. In a classroom setting, it is recommended to choose targets that occur more consistently throughout the individual assessments. Most likely there will be a variety of different results for different targets. A learner who has incorrectly pronounced a target every time it occurred in the assessment most probably is not capable of producing the target sound, or has no awareness of that feature of the language. The learner is in need of perception, production,

and prediction exercises in order to gain the physical and perceptive abilities that are needed for that specific target. More likely than not, targets will contain a mixture of correct and incorrect occurrences. This result could indicate a variety of possibilities as to what kind of practice the learner may need, but it is certain that the learner has the ability to produce the feature albeit not consistently. It may be that the learner is unable to predict accurately where the feature occurs, or that the learner's speech monitor has failed while reading. In any case, it becomes apparent that the learner will probably need prediction instruction and time to practice speech monitoring in order to improve those habits.

The results of the reading assessment should be supplemented by the other two assessments. The free-speaking portion of the assessment can serve to provide additional insight into the learners' speech, as they are likely more focused on meaning—rather than form—when speaking. In this mode, it may be easier to pick up on production issues as learners no longer have orthographic information to supplement their speech.

The words in isolation assessment can be used primarily to garner information into the learners' ability to place stress correctly on the appropriate syllable and provide accurate vowel qualities. This portion of the assessment should be marked separately for stress placement, reduction of vowels in unstressed syllables, and vowel quality of primary stressed and secondary

stressed syllables. These data should aid in making curricular decisions as to whether word stress and vowel quality rules should be included.

Using the diagnostic assessment in this way can be a powerful tool for identifying specific issues in the learners' speech. By performing this type of assessment, identifying important targets for instruction, and designing the curriculum based on those targets, the instructor is able to provide tailored and useful pronunciation instruction ensuring that time is not used needlessly on features of pronunciation that are of no help to the learner. Additionally, the same assessment instrument can be reused to monitor progress in the learners' speech, and identify targets that have been corrected or that could benefit from more practice.

V. Conclusion

Pronunciation instruction has made a comeback recently, especially within more progressive circles that embrace the communicative approach and maintain the goal of improving learners' ability to communicate effectively. In order for such instruction to be integrated readily into current ESL/EFL programs and curricula, instructors must find ways and means to teach it efficiently and effectively so that they do not feel obligated to sacrifice other areas of language instruction. To make this goal possible, a shift in the way pronunciation instruction has traditionally been taught is essential. Further, a way to assess better specific problems in the learners' speech gives instructors the tools they need to make this shift possible.

The Intelligibility Principle (Levis, 2005) tells us that instructors and students should abandon the goal of attaining native-like pronunciation for more realistic goals of comprehensibility and intelligibility. Instructors should focus on teaching pronunciation targets that aim to improve those features that affect intelligibility the most, such as suprasegmentals (Derwing et al., 2012; Field, 2005; Hahn, 2004; Kang, 2010). This change, in principle, makes the traditional Likert scale assessment of "Does the learner sound like a native speaker?" (strongly agree-strongly disagree) obsolete, requiring the development of

assessment instruments that help identify specific speech issues that impede intelligibility.

The diagnostic assessment method that I have outlined in this paper, inspired by the work of W. Dickerson and V. Sardegna, should help instructors find specific targets for improvement that are relevant to the learners' pronunciation goals and aid in the development of curricula that suits the learners' goals. Morley's (1991) instructional framework and Dickerson's (1989, 2000) Covert Rehearsal Model, which include prediction rules (Dickerson, 1994), empower learners to become more autonomous in improving their own speech during private practice. With the proposed assessment tool, instructors will be able to more seamlessly include pronunciation instruction based on the intelligibility principle and learners' needs in their proficiency-based communicative language curriculum without the traditional burden that pronunciation instruction was thought to bring.

Bibliography

- Anderson-Hsieh, J., Johnson, R., & Koehler, K. (1992). The relationship between native speaker judgments of nonnative pronunciation and deviance in segmentals, prosody, and syllable structure. *Language Learning*, 42, 529–555.
- Anderson-Hsieh, J., & Koehler, K. (1988). The effect of foreign accent and speaking rate on native speaker comprehension. *Language Learning*, 38, 561–613.
- Baran-Łucarz, M. (2011). The relationship between language anxiety and the actual and perceived levels of foreign language pronunciation. *Studies in Second Language Learning and Teaching*, 1(4), 491–514.
- Birdsong, D., & Molis, M. (2001). On the evidence for maturational constraints in second-language acquisition. *Journal of memory and language*, 44(2), 235-249.
- Breitkreutz, J., Derwing, T. M., & Rossiter, M. J. (2001). Pronunciation teaching practices in Canada. *TESL Canada Journal*, 19(1), 51-61.
- Celce-Murcia, M., Brinton, D. M., & Goodwin, J. M. (2010). *Teaching pronunciation: A course book and reference guide* (2nd ed.). New York: Cambridge University Press.
- Dauer, R. M. (2005). The Lingua Franca Core: A new model for pronunciation instruction? *TESOL Quarterly*, 39(3), 543-550.
- Derwing, T. M. (2003). What do ESL students say about their accents? *Canadian Modern Language Review*, 59(4), 547–567.
- Derwing, T. M., & Munro, M. J. (1997). Accent, intelligibility and comprehensibility. *Studies in Second Language Acquisition*, 19, 1-16
- Derwing, T. M., & Munro, M. J. (2005). Second language accent and pronunciation teaching: A research-based approach. *TESOL Quarterly*, 39(3), 379-397.
- Derwing, T. M., & Munro, M. J. (2009). Putting accent in its place: Rethinking obstacles to communication. *Language Teaching*, 42(04), 476.

- Derwing, T. M., M. J. Munro & G. E. Wiebe (1998). Evidence in favor of a broad framework for pronunciation instruction. *Language Learning*, 48, 393–410.
- Derwing, T. M., & Rossiter, M. J. (2002). ESL learners' perceptions of their pronunciation needs and strategies. *System*, 30(2), 155–166.
- Derwing, T. M., Thomson, R. I., Foote, J. A., & Munro, M. J. (2012). A longitudinal study of listening perception in adult learners of English: Implications for teachers. *Canadian Modern Language Review* 68(3), 247–266.
- Dickerson, W. B. (1983). Predicting vowel tenseness in English: A reply to Nessly. *Language Learning*, 33(3), 389–394.
- Dickerson, W. B. (1989). *Stress in the speech stream: The rhythm of spoken English*. [Student and Teacher's Text]. Urbana: University of Illinois Press.
- Dickerson, W. B. (1990). Morphology via orthography: A visual approach to oral decisions. *Applied Linguistics*, 11(3), 238–252.
- Dickerson, W. B. (1994). Empowering students with predictive skills. In J. Morley (Ed.), *Pronunciation pedagogy and theory: New views, new directions* (pp. 17-33). Alexandria, VA: TESOL Publications.
- Dickerson, W. B. (2000 March). Covert rehearsal as a bridge to accurate fluency. Paper presented at International TESOL, Vancouver, BC, Canada.
- Dickerson, W. B. (2013). Prediction in teaching pronunciation. *The Encyclopedia of Applied Linguistics*.
- Field, J. (2005). Intelligibility and the Listener: The Role of Lexical Stress. *TESOL Quarterly*, 39(3), 399.
- Flege, J. E., Yeni-Komshian, G. H., & Liu, S. (1999). Age constraints on second-language acquisition. *Journal of memory and language*, 41(1), 78-104.
- Gatbonton, E., Trofimovich, P., & Magid, M. (2005). Learners' ethnic group affiliation and L2 pronunciation accuracy: A sociolinguistic investigation. *TESOL Quarterly*, 39(3), 489.

- Gilbert, J. B. (2012). *Clear speech teacher's resource and assessment book: Pronunciation and listening comprehension in North American English*. Cambridge University Press.
- Hahn, L. D. (2004). Primary stress and intelligibility: Research to motivate the teaching of suprasegmentals. *TESOL Quarterly*, 38(2), 201.
- Hahn, L., & Dickerson, W. (1999). *Speechcraft: Discourse pronunciation for advanced learners*. Ann Arbor: University of Michigan Press.
- Hedge, T. (2001). *Teaching and learning in the language classroom*. Oxford, UK: Oxford University Press.
- Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, 70(2), 125–132.
- Jenkins, J. (2002). A sociolinguistically based, empirically researched pronunciation syllabus for English as an international language. *Applied Linguistics*, 23(1), 83-103.
- Jenkins, J. (2004). Research in Teaching Pronunciation and Intonation. *Annual review of applied linguistics*, 24, 109-125.
- Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21(1), 60–99.
- Jones, R. H. (1997). Beyond “listen and repeat”: Pronunciation teaching materials and theories of second language acquisition. *System*, 25(1), 103–112.
- Kang, O. (2010). Relative salience of suprasegmental features on judgments of L2 comprehensibility and accentedness. *System*, 38(2), 301–315.
- Ladegaard, H. J., & Sachdev, I. (2006). “I like the Americans... But I certainly Don't aim for an American accent”: Language attitudes, vitality and foreign language learning in Denmark. *Journal of Multilingual and Multicultural Development*, 27(2), 91–108.
- Levis, J. M. (2005). Changing contexts and shifting paradigms in pronunciation teaching. *TESOL Quarterly*, 39(3), 369

- Levis, J. M., & Grant, L. (2003). Integrating pronunciation into ESL/EFL classrooms. *TESOL Journal*, 12(2), 13-19.
- Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *TESOL Quarterly*, 25(3), 481.
- Munro, M. J., & Derwing, T. M. (1999). Foreign accent, comprehensibility, and intelligibility in the speech of second language learners. *Language Learning*, 49(1), 285-310.
- Munro, M. J., & Derwing, T. M. (2001). Modeling perceptions of the accentedness and comprehensibility of L2 speech the role of speaking rate. *Studies in Second Language Acquisition*, 23(04), 451-468.
- Murphy, J. M. (1991). Oral communication in TESOL: Integrating speaking, listening, and pronunciation. *TESOL Quarterly*, 25(1), 51.
- Murphy, J. (2014). Myth 7: Teacher training programs provide adequate preparation. In L. Grant (Ed.), *Pronunciation Myths: Applying second language research to classroom teaching* (pp. 188-217). Ann Arbor: University of Michigan Press.
- Piske, T., MacKay, I. R., & Flege, J. E. (2001). Factors affecting degree of foreign accent in an L2: A review. *Journal of Phonetics*, 29(2), 191-215.
- Sardegna, V. G. (2009). Improving English stress through pronunciation learning strategies. Doctoral dissertation, University of Illinois at Urbana-Champaign (UMI No. 3363085).
- Sardegna, V. G. (2011). Pronunciation learning strategies that improve ESL learners' linking. In J. Levis & K. LeVelle (Eds.). *Proceedings of the 2nd Pronunciation in Second Language Learning and Teaching Conference*, Sept. 2010. (pp. 105-121), Ames, IA: Iowa State University.
- Sardegna, V. G. (2012). Learner differences in strategy use, self-efficacy beliefs, and pronunciation improvement. In J. Levis & K. LeVelle (Eds.). *Proceedings of the 3rd Pronunciation in Second Language Learning and Teaching Conference*, Sept. 2011. Ames, IA: Iowa State University.

- Sardegna, V. G., Fu-Hao, W.; & Gosh, M. (In Press). Integrating pronunciation with presentation skills. In T. Jones (Ed.), *Integrating pronunciation with other skill areas*. Alexandria, VA: TESOL Press
- Sardegna, V. G., & McGregor, A. (2012). Principles for teaching pronunciation to international teaching assistants. *TESOL SPLIS Newsletter*, 8(1).
- Sardegna, V. G. & McGregor, A. (2013). Scaffolding students' self-regulated efforts for effective pronunciation practice. In J. Levis & K. LeVelle (Eds.). *Proceedings of the 4th Pronunciation in Second Language Learning and Teaching Conference*, Aug. 2012. (pp. 182-193). Ames, IA: Iowa State University
- Shams, Ashley N., "The Use of Computerized Pronunciation Practice in the Reduction of Foreign Language Classroom Anxiety" (2005). *Electronic Theses, Treatises and Dissertations*. Paper 298.
<http://diginole.lib.fsu.edu/etd/298>
- Trofimovich, P., & Isaacs, T. (2012). Disentangling accent from comprehensibility. *Bilingualism: Language and Cognition*, 15(04), 905–916.
- Zielinski, B. W. (2008). The listener: No longer the silent partner in reduced intelligibility. *System*, 36(1), 69–84.