RESEARCH ARTICLE

Assessing Non-native Speaker's Intelligibility in Lexical Stress through Praat Software

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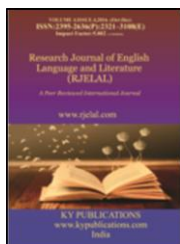
ABSTRACT

English is considered as one of the most widely spoken and recognizable languages in the world. It has become a part of the cultural and social education of many countries and communities. The use of computer software has become a new platform for learning different English Language skills such as reading, listening, writing, and speaking. When it comes to speaking, we always know that correct pronunciation and being intelligible for other listeners is an important factor. Word stress is considered as a prosodic feature of English in which the correct use of it can help the English learner in a better understanding of English language, vocabulary build up, and accent reduction. Using proper word stress can help a non-native English learner to sound more intelligible while speaking. For assessing a non-native speaker's intelligibility in using word stress, Praat voice analyzer software can be used. Praat is a free scientific computer software for the analysis of speech in phonetics. It can analyze human voice in different forms such as; waveform analyses, spectrogram analysis, pitch analysis and, etc. Praat is one the most useful voice analyzer software that is used by many linguists for different research purposes.

Keywords: Intelligibility, Stress, Praat, Non-Native Speakers

1.   INTRODUCTION

English is the most spoken native language in the world, and regarding its real number of speakers, it is globally the most spoken official language, and it is the primary language used in any international affairs.The English language is officially accepted even in those nations or countries where it is not primarily being used as spoken language. It is indisputably the primary language of global trade and commerce.

The teaching of pronunciation has faced drastic change over the history of English language teaching and learning. It was one of the most neglected aspects in English, and it has got more attention with the past half of the twentieth century with the invention of audio-lingual devices. Throughout history, teachers and linguists have attempted to overcome the difficulty of teaching this skill. In this respect, they have tried to develop various methods and techniques with other related sub-disciplines such as phonetics, phonology, and second language acquisition among others.

Pronunciation is generally defined as "the manner in which speech sounds, especially connected sequences are articulated by individual speakers or by speakers generally" (Trask, 1996, p. 21). Taking it to consideration, pronunciation is closely linked to the study of phonetics which involves the scientific study and description of speech sounds. According to Pennington & Richards (1986), pronunciation can be defined as "articulation of individual sounds and, to a lesser extent, with the stress and intonation patterns of the target language" (p. 32).

2. **The Importance of Learning Stress for Second Language Learners of English**

Murphy (2004), says that focusing on word stress helps the learners in learning vocabulary. After presenting a numeric system to classify stress patterns in English to two ESL classes, he questioned his students to get feedback about his tutorial methods. The numeric system that he designed only provided information to the student for considering the number of syllables in a word to guess which syllable of the word would get the stress. However this system is minimal and does not merely specify rules of thumb, but it still recommends that students can take advantage of it, since 25% clearly accepted that "applying the numeric system assisted them in learning new words pronunciation", and "to learn about using new words in conversation" (36%).

In Tremblay (2008), it is also advised that more advanced learners can use word stress to identify words. Although the linking is not instant, this does suggest that there is a connection between instruction and word stress processing. Tremblay says that "knowing where the primary stress is placed in English words is not enough for L2 learners to be capable of using stress for L2 lexical access" (p. 353). With respect to Anderson's Active Control of Thought (ACT), before automatizing the process, first, there must be a perceptive stage and an associative stage, both of which may be facilitated through a metalinguistic understanding of stress.

3. **The Importance of Stress in Pronunciation Intelligibility**

Speaking and understanding English does not come only from using correct grammar and vocabulary, Native English speakers convey meaning in their sentences with correct stress and intonation, i.e., the ups and downs and musical notes of their sentences. Stress is a vital part and also a complicated aspect of communication, and mostly they are counted as the unconscious mechanisms among the native speakers. Stress belongs to suprasegmental aspect of English pronunciation. On the other hand, stress is the loudness or emphasis on a certain syllable in a multisyllabic word in which the pitch of the voice rises and falls throughout an utterance that in result it creates melody or intonation contour.

Lexical stress is about how to pronounce a word rather than what to say. In English like many other languages, stress has a grammatical effect on the different type of phrases or sentences and can distinguish them from each other. Native speakers can speak with proper lexical stress naturally and intelligibly, but as a second language or foreign language learner, it is mostly difficult to follow the correct stress patterns. Lexical stress focuses on the essential elements of spoken messages, and it also helps in improving communicational interaction. Proper use of lexical stress can help a learner to sound more intelligible.

Altogether, in English language teaching, stress is communicatively necessary, but they are notoriously difficult to be learned by second language learners.

4. **Computer Assisted Language Learning (CALL) and its Effectiveness on Pronunciation Intelligibility Enhancement.**

There has been a massive development of user-friendly computers and software and also a rapid reduction in their prices in the last decade. Nowadays computers are present in almost every home, office, and school. In the current century, a computer is a vital need for everyone to use it to some extent to function in the society. In several countries of the world, in the educational context, audio language labs are being replaced by computer centers or computer labs equipped with internet connection facility.

Computer Assisted Language Learning (CALL) is an approach to teaching and learning in which the computer or computer-based resources such as software or the Internet are used to present,

reinforce and evaluate the materials which have to be learned. It includes a substantial interactive element. Using CALL also involves the search for and the investigation of applications in language teaching and learning. CALL is also known by several other terms such as technology-enhanced language learning, computer-assisted language instruction, and computer-aided language learning.

Considering the use of computers in language teaching and learning, it has been several years that teachers and researchers have been testing, using and developing ways to use computers in their teaching methods since computer devices have been available for most of the students. With the fast development of computers in our daily life, we also started using computers in our classroom.Language teachers can assist the development of learners' language acquisition by using computer-assisted language learning (CALL) in current teaching context.

With the help of computers, the students can have access to many software and internet based resources for which they can improve their pronunciation intelligibility. Using computers provides access to many online or offline video lessons, dictionaries, podcasts, English learning software, and online language labs.

With having access to all mentioned above material with the help of computers the learners can significantly improve their pronunciation intelligibility.

Although the scope of CALL has been extended in recent years, it is still not a perfect and complete method for teaching or learning all aspects in a language. The quality of programs has not yet acquired the level of evaluating the users' natural spoken language or its usage appropriateness in the context above.

5.   Praat Software as a CALL Tool

Praat (the Dutch word for "talk" or "speak") is a free scientific computer software for the analysis of speech in phonetics. It was programmed and continues to be developed, by Paul Boersma and David Weenink. This software also supports speech synthesis, including articulatory synthesis.Praat is one of the most commonly used programs for the

purpose of speech analysis among linguists. Boersma & Weenink (2015).

In this paper, we will introduce a method for analyzing and differentiating an intelligible utterance from an unintelligible one and how to enhance the intelligibility of pronunciation in word stress and sentence intonation.

6.   Assessing Intelligibility of Pronunciation in Word Stress.

As we have already mentioned, the native speakers of English acquire the skill for pronouncing the words and sentences with correct stress and intonation naturally and by birth; so a native speaker's pronunciation is an ideal sample for assessing a non-native speaker or an ESL learner s' pronunciation

The figure below shows a sample voice analysis done by Praat software in which the tri-syllabic word "confident" uttered by the native speaker.
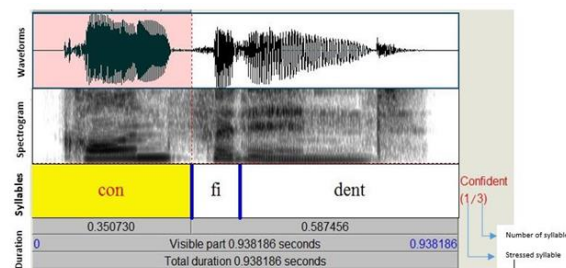

Figure 1: Sample of an Intelligible Digital Voice Analysis for Word Stress

As it is shown in Figure1, the digital analysis done by Praat software consists of 3 parts.The first section shows the vocal analysis of the word by relative waveforms, the second row displays the intensity of voice by showing the spectrogram analysis of the pronounced word, and the third row shows the divided syllables of the word. Beneath the row that shows syllables of the word, the time duration of each syllable and the total length of utterance for the word is mentioned.

In this example the word "confident" consists of three syllables; "con", "fi", and "dent". In Figure 1, the syllable section shows that the stressed syllable "con" is highlighted from other syllables. In this figure, The two arrows on the lower right-hand side signify that the digit "3" means the total

number of syllables in the word and the digit "1" means that the first syllable gets the primary stress.

The first row in Figure 1 displays the sound waveform of the pronounced word. The waveform analysis in this figure shows more wave density on the first syllable which indicates that the first syllable gets the main stress.

The second row in Figure 1 displays the spectrogram of the pronounced word. The spectrogram analysis that is shown in the second section of this figure indicates the higher intensity of voice in the pronunciation of the first syllable("con") which caused the left part of the spectrogram bar to get darker than the other regions and it signifies that the primary stress is fallen on the first syllable.

7. **Assessing Non-native Speaker's Intelligibility of Pronunciation in Word Stress.**

The comparative figure below shows the difference between an intelligible word stress pronounced by a native speaker and an unintelligible word stress pronounced by a non-native speaker.
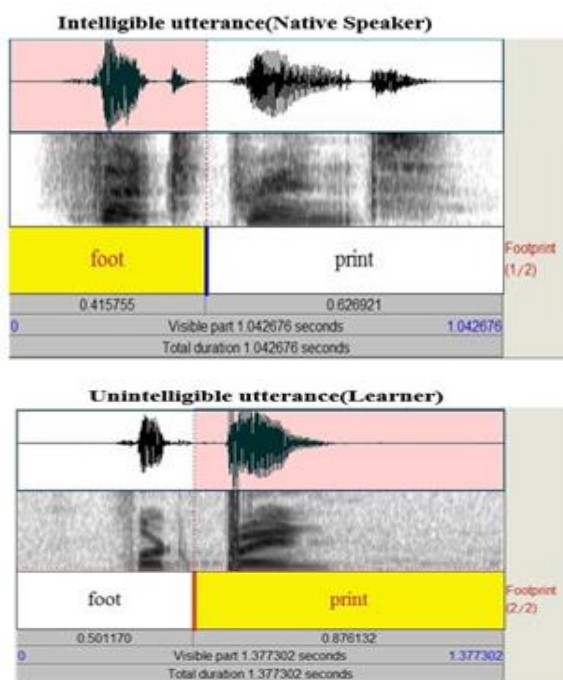

Figure 2: Intelligibility Analysis of Word Stress Done by Praat Software

As it is shown in the above figure, the intelligibility of a non-native speaker's utterance is determined by comparing its digital analysis with the native speaker's utterance. This figure shows the

digital analysis of Praat software for the word "footprint" which is uttered by both the native speaker (left part of the figure) and non-native speaker or learner. (right part of the figure).

The digital analysis of native speaker's utterance shows that there is a significant waveforms density and voice intensity on the location of the first syllable of the word which shows that the native speaker intelligibly pronounced the word with correct stress.

The digital analysis of learner's utterance shows that the waveforms density and voice intensity is incorrectly fallen on the second syllable of the word which shows that the learner's utterance is not intelligible according to the software pronounced the word with correct stress.
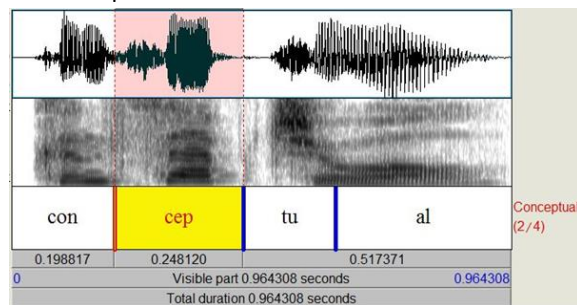

Figure 3: Native Speaker's Intelligibility Analysis for the Word "Conceptual"

Figure 3 shows the native speaker's voice analysis for the word "conceptual". As per the analysis provided in this figure we can observe that this word contains four syllables, and according to the wave density analysis provided on waveform row and the spectrogram analysis on the spectrogram row, it is identifiable that the primary stress is fallen on the second syllable ("*cep*") as there are visible higher waveforms on the area of this syllable.

Figure 4 depicts the non-native speaker's voice analysis for the word i.e. "conceptual". The analysis provided in this figure shows that the waveforms on the area of second syllable("cep") are longer and there is more density of waves on it compare to other syllables. Furthermore, the spectrogram analysis of the figure slightly shows more voice intensity on the location of second syllable *("cep")*.

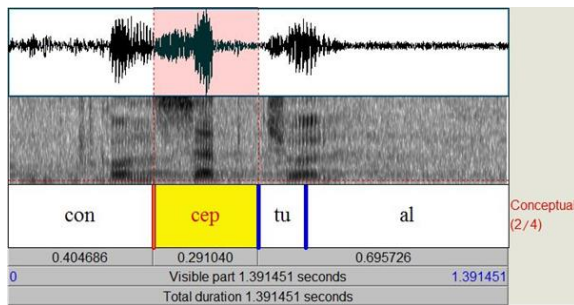KHALED KORDI TAMANDANI, MEHRNAZ JAHANSHAHI

Figure 4: Non-Native speaker's Intelligibility Analysis for the Word "Conceptual"

By comparing this figure with Figure 3 where the same word is pronounced by the native speaker, we can observe a similar waveforms and voice intensity throughout the pronunciation of the word . Hence we can conclude that the non-native speaker successfully managed to produce an intelligible pronunciation for this word the second syllable more stress than the other syllable.

Hence we consider non-native speaker's pronunciation as an intelligible one. Although both the figures accurately show the stressed syllable but, the digital analysis in Figure 3 (native speaker's pronunciation) shows that the waveforms are longer and higher and the intensity of voice in spectrogram section is visibly stronger compare to Figure 4 (non-native speaker's pronunciation)

8. Conclusion

According to the digital sound analysis that are shown in different figures of this paper, we can conclude that Praat software is quite useful for a non-native speaker for enhancing and assessing intelligibility of their pronunciation by constant comparison with native speaker's pronunciation.

While analyzing Non-native speakers' pronunciation with Praat software, the software may show that their intelligibility level is not at same level as the native speakers, but with the help of Praat software, they can monitor and improve the intelligibility of their pronunciation to acquire similar intelligibility level to a native speaker.

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