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# Second Language Learners' Phonological Awareness and Perception of Foreign Accentedness and Comprehensibility by Native and Non-native English Speaking EFL Teachers

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## Abstract

**Phonological awareness has been defined as the speaker's sensitivity to the phonological characteristics of a language. The present study is aimed at exploring the relationship between Iranian EFL learners' explicit phonological awareness, their foreign accentedness and speech comprehensibility as perceived by native and non-native English-speaking EFL teachers. To determine the relationships, the researchers used a set of tasks that measured 34 EFL learners' phonological awareness in five domains of rhyming, alliteration or onset, segmenting, blending, and manipulation. They also asked the participants to read a short text which was recorded and later rated for accentedness and comprehensibility on a 9-point scale. Results indicated that there was a significant correlation between the learners' phonological awareness and perception of foreign accentedness. The same was true about the correlation between phonological awareness and speech comprehensibility. Furthermore, a strong positive correlation was found between foreign accentedness and comprehensibility, suggesting that foreign accentedness could affect comprehensibility of L2 speech. The findings suggest that pedagogical strategies that highlight formal properties of language be employed in second language classrooms to reduce learners' foreign accent and increase their speech comprehensibility.**

*Keywords:* phonological awareness, foreign accent, comprehensibility, EFL learners

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There are a number of different skills involved in learning and speaking a second language (L2) such as grammar, vocabulary and pragmatics, yet pronunciation seems to be the most challenging skill, especially for adult learners, as it involves intricate coordination of a set of cognitive and physiological skills (Celce-Murcia, Brinton, Goodwin, & Griner, 2010). On the importance of pronunciation to L2 learners, Farser (2000) points out that learners with proper pronunciation are more likely to be understood even if their knowledge of grammar or vocabulary is weak, whereas learners with lousy pronunciation will be misunderstood, even if they are good at grammar or vocabulary. Gilakjani (2012) adds that learners' self-confidence will be undermined and their social interactions will be limited if they happen to have a poor pronunciation. MacIntyre (2007) also states that some learners might not be willing to communicate with native speakers even when they have the opportunity due to stress and anxiety of the situation, and it stands true, especially for learners with poor, unintelligible or incomprehensible pronunciation. Intelligibility and comprehensibility of L2 pronunciation are particularly important for adult learners for higher education. Many university classes throughout the world require learners to have a high level of oral skills; they should take part in classroom discussions, work in pairs and give lectures (Murphy, 1991). Therefore, accurate pronunciation is one of the leading indicators of competence in a language (Ali & Segaran, 2013; Galaczi, Post, Li & Graham, 2011).

One of the prominent features of L2 speech is *accentedness* (Park, 2015), meaning the speech of non-native speakers sounds foreign or unfamiliar to native speakers. Specifically, the term accentedness refers to the degree that the pronunciation of an utterance differs from a standard pattern of native speakers' utterances (Derwing & Munro, 2005). Foreign accent is potentially influenced by some factors such as cross-linguistic transfer (Gass & Selinker, 2008; Navehebrahim, 2012), the age of L2 learning (Hurford 1991; Long, 1990), motivation (Gatbonton, Trofimovich & Magid, 2005; Gilakjani, 2012), attitude (Elliot, 1995), and

instruction (Derwing, Munro, & Wiebe, 1998; Lord, 2005). Research has shown that speech with deviations from the standard pronunciation does not enjoy an expected level of intelligibility and comprehensibility (Munro & Derwing, 1995; Tsurutani, 2012). Hence, teaching acceptable pronunciation should be one of the priorities in L2, although it has not found its deserved place in L2 syllabi and classroom environments (Baker & Murphy, 2011; Derwing & Munro, 2005; Gilner, 2008).

One of the factors giving rise to foreign accent in L2 is the influence of the learners' first language (L1) sound system (Rogers, 1997; Weil, 2001). Therefore, L2 teachers need to be aware of the influence of learners' L1 sound system on the L2 pronunciation. The awareness can, in turn, help them and their students raise their awareness of phonological (segmental and suprasegmental) differences between L1 and L2. Awareness of the characteristics of the sound system of a language, including sounds, syllable structure, and phonotactics of the language, has been called phonological awareness (Snow, Burns & Griffin, 1998). This construct has been introduced as a predictor of the acquisition of reading, vocabulary, and spelling skills both in L1 and L2, and even though its correlation with L2 speech accentedness and intelligibility or comprehensibility have been investigated in some studies, to the best knowledge of the authors, very little attention has been paid to this relation in the Iranian EFL context. The purpose of this study is, therefore, to investigate the relationship between phonological awareness and L2 speech accentedness and comprehensibility.

## Literature Review

To convey the idea that pronunciation has for long been given the least attention in language learning and teaching, Kelly (1969) used the metaphor "Cinderella" for the skill (p. 87). The models and goals for pronunciation teaching have been changing though, thanks to the efforts by a growing number of language teaching experts such as McKay (2002) and Walker (2010) who believe the primary goal of language is communication and pronunciation should be an integral part of language

teaching. In the following sections, three issues related to L2 pronunciation, namely phonological awareness, foreign accentedness, and comprehensibility, will be discussed.

**Phonological Awareness**

Phonological awareness (also known as meta-phonological or meta-phonological awareness) broadly refers to the ability to perceive and manipulate the sound system of a language independent of meaning (Goswami & Bryant, 1990). It includes both basic units of a language such as phonemes and larger units such as rhymes and syllables. Similarly, Cassady, Smith & Huber (2005) and Snow et al. (1998) define the term as a speaker's sensitivity to the phonological system of a language, including sounds, syllable structure, and phonotactics of the language.

Phonological awareness is generally measured by how well learners can focus on the structure of the L1 and L2 system (Venkatagiri & Levis, 2007); however, there are some specific tasks which introduce this construct better. The first task which is still used was the *phoneme deletion* developed by Bruce (1964). In this task, the learner is provided with a word (e.g., cat) and is supposed to cross out a particular sound mentally (e.g., /t/) and say what is left, (ca). Other tasks measuring phonemic awareness are *phoneme blending* (e.g., what does /c/ /a/ /t/ say?), *phoneme counting* (e.g., tap out each sound in cat) and *phoneme reversal* (e.g., say the sounds of cat backward). Awareness at larger units encompasses *syllable segmentation* (e.g., say each syllable of the word library) and *rhyme judgment* (e.g., does sheep rhyme with feet?).

Language development research shows extensive investigations on phonological awareness, yet most of them have concentrated on the L1 acquisition. The development of phonological awareness in children begins with sensitivity at the syllabic level, and moves to sensitivity at the onset-rime level, and eventually to sensitivity at the phoneme level (Goswami & Bryant, 1990). It has been found in many studies that children with high levels of phonological awareness were better at reading and

writing in their L1 (McBride-Chang, Bialystok, Chong & Yanping, 2004; Piske, 2008). Wolter and Pike (2015) found that phonological awareness, morphological awareness, and vocabulary contribute to actual word spelling in teenager native speakers of English. It has also been found this construct is vitally significant in L1's reading skills (Amini, 2003; Huang & Hanley, 1994) and vocabulary development (Metsala, 1999). Studies on monolingual adults have confirmed these findings; for instance, Williams's and Wood's (2012) research on skilled readers' sensitivity to the lexical tone and morphological patterns suggested a positive relationship between this sensitivity and reading skills.

In the realm of teaching foreign languages, teachers assume that explicit instruction of the L2 phonological system might facilitate and subsequently boost the learning process. Piasta and Wagner (2010) state that the explicit instruction of phonological awareness, combined with grapheme-phoneme instruction, facilitates the acquisition of alphabetic principle and the correct development of phonological abilities. Phonological awareness has been found to be related to the instruction of reading skills for L2 learners (Giambo & McKinney, 2004). The study by Ziolkowski and Goldstein (2008) also revealed that such knowledge assists the acquisition of reading.

Cross-language transfer of phonological awareness and its impact on L2 reading has specifically been studied in several studies (Cisero & Royer, 1995; Gottardo, Yan, Siegel & Wade- Woolley, 2001; Riccio et al., 2001). Cisero and Royer (1995) reported that students' ability to distinguish initial sounds in their L1 predicts their ability to do the same in L2. Durgunoglu Durgunoglu, Peynircioglu & Mir (2002) stated that Spanish speaking first-grade individuals, with good command of phonological awareness, can read English words with better pronunciation than students who were roughly familiar with English phonetic features. Thus, phonological awareness significantly predicts vocabulary recognition performance both "within and across languages" (Durgunoglu et al., 2002, p. 461). Another attempt in this regard is Zhao, Joshi, Dixon & Chen (2017) study. The crucial role of metalinguistic awareness and

phonological awareness as one of its subsets in acquiring English spelling both for native speakers and foreign speakers of English has been discussed in their study. The results of their research revealed that orthographic awareness and morphological awareness correlated with spelling for native English speakers, while morphological awareness, orthographic awareness, and phonological awareness correlated with spelling for the EFL group.

**Foreign Accentedness**

Every native speaker of a language may encounter a wide variability in the way their mother tongue is spoken, variability that can be accounted by differences in pitch, speaking rate, and social and regional characteristics of the speakers. Native speakers also experience that variability when talking to non-native speakers of their language, and a phenomenon is generally known as a foreign accent. The term refers to the degree that the pronunciation of an utterance differs from a standard pattern of native speakers' utterances (Derwing & Munro, 2005) or to divergence from the acoustic (e.g., formants, pitch, timing, voice quality) and prosodic (e.g. intonation, duration, and speaking rate) norms of a particular language (Felps, Bortfeld, & Gutierrez-Osuna, 2008). Flege, Munro, and MacKay (1995) also stated that foreign accent results from the inaccurate production of position-sensitive L2 allophones stemming from the speakers' inability to distinguish them from one another.

An extensive review of the literature has shown that the presence of foreign accent might reduce the credibility of non-native speakers (Lev-Ari & Keysar, 2010) or will probably influence listeners' attitudes towards them (Lev-Ari & Keysar, 2010, Pantos, 2010). However, some degrees of foreign accent would not be that much problematic to prevent communication (Munro & Derwing, 1995; Saito, 2011). Trude, Tremblay, and Brown-Schmidt (2013) add that despite the difficulty, listeners quickly adapt to the perceived differences and that the more time one spends

interacting with non-native speakers, the more comfortable they become to understand (Porretta et al., 2017).

Since the topic of foreign accent has been proven to be closely related with various issues in L2 speaking development, such as the critical period, fossilization, and pronunciation teaching, many linguists, and ESL researchers have taken a keen interest in the issue. Different methods of assessment have already been suggested to evaluate the degree of this variable, yet using listener rating data has been known as the most common approach in foreign accent research (Park, 2015). In this approach, listener-raters evaluate the received utterance on an n-point scale (generally from three to eleven) that ranges from 'powerful foreign accent' to 'no foreign accent.' Park (2015) and Piske et al. (2001), for instance, utilized a 9-point scale in their studies. Due to the presumable problems regarding the reliability of this approach, foreign accent assessment can also be carried out by computer-assisted instrumental acoustic analysis. The fact is, not many of these analysis methods can be found in L2 research, probably due to their complex nature (Kang et al., 2010).

As acknowledged in some foreign accent studies (e.g., Piske et al., 2001), some variables are influencing the degree of accentedness of which segmental and suprasegmental features are two notable ones. As for segmental features, the first cause of foreign accent in L2 is L1, meaning that if an L2 phoneme is very similar to an L1 phoneme, accented speakers will usually produce the L1 phoneme in both L1 and L2 (Weil, 2001). If accentedness is the result of the phonological differences between L1 and L2, examining the relationship between L1 and L2 might give a chance to predict phonological errors and deviations (Weil, 2001). The influence of L1 on L2 utterance production was investigated by Rogers (1997). In his study, he examined the speech of native English speakers and Mandarin speakers speaking English. The findings revealed that some English sounds deviated from the original native accent when uttered by Mandarin speakers regarding the place of articulation, the manner of articulation, and voicing. Besides, Mandarin speakers had difficulty pronouncing

consonants at the end of the words, and that might be due to Mandarin having a few numbers of word-final consonants.

As for suprasegmental features, up until recently, little attention has been given to their role in the intelligibility and the naturalness of L2 pronunciation (Kamiyama, 2010). Some recent studies probing the effect of suprasegmental features (e.g., intonation, duration, prosody, etc.) are those by Kamiyama (2010) and Kang (2010). Kamiyama's (2010) study examines the French native speakers' perception of French spoken by Japanese learners. The study reported that prosody is of high significance in the appraisal of the naturalness by French listeners, and that "native-like prosody could improve the naturalness of utterances with non-native-like segments significantly" (Kamiyama, 2010, p. 5). Moreover, Incera, Shah, McLennan, and Wetzel (2016) worked on sentence context, the predictability of the final word, and its impact on the perception of foreign accent; the results of their study revealed that words in unpredictable sentences were regarded highly accented in comparison to the words in predictable sentences.

Studying foreign accents concerning other variables has recently become the topic of interest in the L2 studies. One of the studies to mention is that of H. Park (2013), which investigated whether native listeners can recognize a foreign accent, in short, slightly accented sentences and also if such judgment is connected to the non-native speakers' L1 syllable structures. To answer these questions, eight native listeners' sensitivity to a foreign accent was tested. It was proven that all the listeners recognized an accented speaker from hearing the monosyllabic structures and that the L1 segmental phonotactics play a crucial role in detecting a foreign accent. To mention another research, Park (2015) explored the correlation between phonological awareness and foreign accent on twelve advanced level adults and suggested that there is no meaningful relationship between these two variables. The participants read an English text, and four native speakers rated their accentedness on a 9-point scale. Foreign accent has even been neurolinguistically explored in some works (e.g., Grey & Hell,

2016; Porretta, Tremblay, and Bolger, 2017). In Grey and Hell's (2016) study, semantic and syntactic processing of native- and foreign-accented utterances was investigated; thirty-nine native English monolinguals listened to sentences uttered by speakers with foreign and native accents while their brain reactions were recorded utilizing EEG/ERPs. The results indicated that the human brain completely recognizes the identity of a native and non-native speaker and that different accents are the source of different neural reactions in native- accented versus foreign-accented speakers. The present study has also been conducted with the aim of exploring phonological awareness and its impact on the strength of foreign accent.

**Comprehensibility**

The concept of comprehensibility, typically measured through human raters' judgments (Derwing & Munro, 1997; Derwing, Munro, & Carbonaro, 2000; Munro & Derwing, 1999, 2001), is denoted as the listeners' understanding of the amount of effort engaged in perceiving non-native speakers' (NNSs) speech. The prior studies in the realm of L2 speech production have regarded comprehensibility as a realistic, actual, an important goal for L2 learners by considering its close tide with communicative success (Derwing & Munro, 2009). Comprehensibility has been identified to be a consistent predictor of intelligibility (Munro & Derwing, 1999). This close association demonstrates that the attempts made to perceive NNS utterances represent the listeners' competence to analyze the NNS speech accurately. (Warren, Elgort, & Crabbe, 2009). Even though intelligibility is described as the listeners' actual understanding of L2 speech (Munro & Derwing, 1999), comprehensibility and intelligibility have interchangeably been applied to signify the listeners' ability to perceive L2 speech in a broad sense (Levis, 2006). Comprehensibility is the listener's experience of the difficulty level of speech understanding while intelligibility deals with the amount of the understood speech by the addressees (Munro, 2011).

Hence, in the broader sense, comprehensibility and intelligibility have been considered as the appropriate objectives of L2 instruction (Munro & Derwing, 1999) and L2 assessment (Levis, 2006) while in the narrower sense, the operationalization of these two constructs demonstrates fine distinctions between them. For instance, the result of the study conducted by Derwing, Munro, and Wiebe (1998) suggested that instruction contributes to the learners' amount of intelligibility and/or comprehensibility; however, Derwing and Rossiter (2003) found that explicit instruction on vowel and consonant errors plays a pivotal role in enhancing the learners' intelligibility, but it exerts no considerable influence on the learners' total comprehensibility. As earlier mentioned, comprehensibility has been prioritized over many constructs such as intelligibility in many contexts due to its realistic nature and importance. That is to say, choosing comprehensibility as a yardstick of understanding in contrast with the more objective features of intelligibility (Isaacs, 2008), was initially stimulated by the applicable and practical considerations.

Recent studies have focused on the influence of listeners' background on comprehensibility ratings (O'Brien, 2014). For example, Munro, Derwing, and Morton (2006) used inexperienced listeners to rate the comprehensibility of some utterances and illustrated that there are no quantitative differences between the rating of the incompetent listeners and that of the able ones. Also, in their study, they attempted to compare the comprehensibility of a group of L2 learners whose L1 was either Cantonese, Japanese, or Mandarin, with that of native English listeners. Their findings illustrated that the groups mentioned above comprehended L2 English speech in a similar vein; therefore, they reached to this conclusion that there exists a "basic underlying ability to comprehend accented speech that is shared by most people" (p. 128). Another exciting finding obtained from the same study was that the Cantonese and Japanese listeners comprehended and rated the speech of their L1 speakers more efficiently in comparison with the speech of other speakers, even native speakers of the target language.

It is plausible to claim that the crucial role of suprasegmental features of speech should not be ignored in this field. Seemingly, when it comes to rating speakers' speech for comprehensibility, listeners are likely to attend carefully to the segmental and suprasegmental elements of utterances (Caspers, 2010; Derwing & Munro, 1997). For instance, Trofimovich and Isaacs (2012) explored the role of stress as a prosodic factor of speech, and Kang (2010) found that the delivery pace of the speech impacts on comprehensibility ratings. It has additionally been proven in other studies that, other characteristics of speech such as grammatical accuracy and lexical abundance, which are not necessarily in the territory of pronunciation, bear a relationship with comprehensibility. (Trofimovich & Isaacs, 2012).

In summary, although L2 phonological awareness has been studied regarding the acquisition of L2 vocabulary, spelling, and reading, much less attention has been paid to the correlation between phonological awareness and the development of the phonological aspects of L2 that contribute to listeners' accent judgment and comprehension of accented speech. Given the importance of pronunciation in achieving effective communication (Derwing & Munro, 2009), it is of high necessity and importance to devote time and attention to teaching pronunciation skills in EFL contexts, especially in areas foreign accentedness, intelligibility and comprehensibility (Baker, 2013; Derwing & Munro, 2009). As Atli and Su Bergil (2012) point out, "pronunciation classes should be an integral part of the curriculum in institutions that train language teachers" (pp. 3670-3671). Such training will assist language teachers in mastering the sound system of language and becoming a proper model for their students in the future. This research aims to tackle some of the issues as mentioned earlier by finding the answers to the following questions:

1. Is there any significant relationship between L2 learners' phonological awareness, their degree of foreign accentedness and speech comprehensibility as judged by native and non-native English-speaking EFL teachers?

2. Is there any significant relationship between L2 learners' gender and their degree of foreign accentedness and speech comprehensibility?
3. Is there any significant relationship between L2 learners' proficiency levels, their foreign accentedness and speech comprehensibility?
4. Is there any significant relationship between L2 learners' foreign accentedness and speech comprehensibility?

## Method

### Aims

This study sought to investigate the relationship between L2 learners' phonological awareness and perception of foreign accentedness on the one hand and the relationship between phonological awareness and degree of L2 speech comprehensibility on the other hand. It also sought to find out whether the learners' gender and language proficiency level would relate to the perception of foreign accentedness and speech comprehensibility. Finally, the researchers wished to know if there is any relationship between L2 learners' foreign accentedness and comprehensibility ratings. The learners' foreign accentedness and comprehensibility were rated by two native and two non-native English-speaking EFL teachers. Following Park's (2015), we based our argument on the assumption that if L2 learners' superior phonological awareness correlates with lesser degrees of foreign accentedness and more comprehensibility for that matter, then we would be safe to claim that there is an association between these constructs. However, if such an association is non-existent, then we can argue that phonological awareness, comprehensibility, and accentedness are separate concepts from one another.

### Participants

The participants consisted of two entire classes of freshmen (n=34) majoring in the English Language and Literature at Shahid Beheshti

University, Tehran, Iran. They were at intermediate, upper-intermediate and advanced levels of English language proficiency as determined by their scores on a general English proficiency test, the estimated reliability index of which was .76. The students ranged from 18 to 25 in age (mean age: 21.58) and were informed of the purpose of the study and voluntarily took part in the research. All participants learned English as a foreign language via typical foreign language instruction as practiced in many English language institutes in Iran, that is, instruction in which the four language skills are worked on using imported general skills ELT textbooks such as *American English File* or *Topnotch* series. The reported mean length of the EFL instruction was 5.3 years. None of the participants had lived in an English speaking country.

The researchers also solicited the help of four raters (two native and two non-native English speaking EFL teachers) to judge the learners' speech comprehensibility and foreign accentedness. The native EFL teachers, one female (32 years old) and one male (36 years old), were both North American speakers of English. They had been teaching English in Iran for 6.5 and 8.7 years respectively. The two non-native teachers, also a female (42 years old) and a male (38 years old), had been teaching English for more than eight years. The teachers held valid IELTS scores of 8 and 8.5 respectively, which would categorize them as *perfect language users* based on the IELTS 9-band scale. Although the raters were experienced EFL instructors, they did not engage in rating L2 speech comprehensibility and foreign accentedness routinely and needed some training.

## Materials and Instruments

The purpose of this study was to investigate the correlation between L2 learners' phonological awareness, their degree of foreign accentedness and speech comprehensibility as judged by the native and non-native EFL teachers. To determine the relationship, the participants' phonological awareness, foreign accentedness, and speech comprehensibility had to be measured through specific tasks elaborated below:

**Tasks to elicit students' phonological awareness**

Generally, phonological skills involve five domains of rhyming, alliteration or onset, segmenting, blending, and manipulation (Hester & Hodson, 2009, p. 90).

**Rhyming**

Two types of task, namely generation, and categorization were used to assess rhyming. The generation task required participants to name as many words they could in 30 seconds in rhyme with a given the word (e.g., the words in rhyme with *panel*). For the categorization task, participants were given a list of words and asked to categorize the words that rhymed.

**Alliteration**

The participants were provided with a set of three words on the paper, two of which alliterated. The participants had to identify and check off the two words that they thought alliterated (e.g., *coat, kale, cell*).

**Segmenting**

Segmentation is defined as the process of boundaries identification between words, syllables, or phonemes (Richards & Schmidt, 2013). Two tasks were used to measure the segmentation ability. The first task, syllabic reversal task (Alegria, Pignot, & Morais, 1982), asked the participants to reverse syllables of multi-syllable words (e.g., nevig for given). They were told to make non-words with the sensible consonant-vowel order. In the second task, the participants were asked to tell the number of sounds in given written words (e.g., four sounds in 'power').

**Blending**

Phonological blending has two levels, blending phonemes to make syllables and blending syllables to make words (Venkatagiri & Levis, 2007, p. 267). The phoneme-blending task required students to write the

word/syllable after hearing the sounds separately (e.g., participants hear: /s ɛ n s ɪ b l/, write: sensible).

**Manipulation**

Hester and Hodson (2009, p. 92) consider deleting, adding, substituting, and transposition skills as components of this ability. In deleting a task, the participants were asked to remove initial/final consonant/vowel of a word, then utter it (e.g., delete's' in 'song' and utter /ɒŋ/). As for adding and substituting tasks, the participants were asked to add an initial consonant to a given syllable to make sensible words (e.g., for given syllable 'ice' they can add 'm'), then substitute the added initial consonant with another one to make a new word (e.g. substituting 'm' in 'mice' with 'n' or 'r').

**Measurement of foreign accentedness and comprehensibility**

A short passage (183 words) from *ACTIVE Skills for Reading* – Book 1 by Neil J. Anderson was given to the participants to read aloud. The researchers made sure that the learners knew all the words and their pronunciation to avoid the influence of possible intervening factors. The participants read the given passage, and their speech was recorded with a sound recorder program. Four raters then assessed the speech accentedness and comprehensibility of the participants' recorded voice on two 9-point Likert scales, the ends of which were given contrasting labels from ‘very heavy foreign accent' to ‘no foreign accent' or ‘highly comprehensible' to ‘highly incomprehensible.' The scheme has been employed in recent studies of foreign accent and comprehensibility (e.g., Jesney, 2004; Munro & Derwing, 2001; Riney, Takada & Ota, 2000).

**Procedure**

The study started off by giving the two classes of students a general English proficiency test to assess their language proficiency. Based on their scores, the students were divided into intermediate (n= 12), upper-

intermediate (n= 15), and advanced (n= 7) levels. Table 1 gives the distribution of students in each level.

Table 1.
*Distribution of Students in each Proficiency Level*

| Intermediate | | Upper-intermediate | | Advanced | |
|---|---|---|---|---|---|
| 12 | | 15 | | 7 | |
| Male | Female | Male | Female | Male | Female |
| 7 | 5 | 3 | 12 | 3 | 4 |

The participants then took a set of phonological awareness tasks and a reading task administered individually in a well-lit and quiet room where they felt physically and emotionally at ease. Some of the phonological awareness tasks were in the paper and pencil format, and some of them were performed orally. Categorization task in rhyming, identification task in alliteration and the tasks related to segmenting were administered simultaneously in paper and pencil format. The tasks took around thirty minutes to complete. Other tasks, including generation task in rhyming, the tasks related to blending, and the tasks related to manipulation (deleting, adding, and substituting) were administered orally and separately for each participant in 15 minutes. Before testing, the participants completed two practice items for each of the phonological awareness tasks. During the practice trials, the participants received direct explanations from the test administrators so that they could understand the requirements of each task. The participants' performance in oral and written tasks was computed, and the total score (out of possible 100) indicated their level of phonological awareness (See the Appendix for the phonological awareness tasks, the number of items, and scoring procedure for each task).

The reading task was administered a week later with short preparation time: the participants were asked to read the given passage aloud after practicing it for a few minutes. The participants' read-aloud speech was audio-recorded, with each recording lasting between 1.5 and 2 minutes

depending on the learners' speech rate. The first and the last three sentences read were excluded to allow for warm-up and cool-down. The raters judged the accentedness and comprehensibility of each recorded voice on two separate 9-point scales. The raters were asked to listen to at least 30 seconds of each recording before marking the appropriate point on the scale. They were also allowed to replay and listen to the recordings as many times as they wished, but they reported that 30 seconds were enough for them to make their judgment. The raters assessed the accentedness and comprehensibility with a one-week gap.

## Data Analysis

After data collection, the written and audio-recorded responses of each learner participant were tallied and computed. The participants' performance on phonological awareness tasks were coded for analysis by the researchers and an assistant, using the coding scheme in the appendix. For the phonological awareness tasks (Tasks 17), participants received a point for each accurate response. The participants' accentedness and comprehensibility ratings were calculated and analyzed via appropriate statistical procedures.

## Results

The relationship between the learners' phonological awareness as measured by a set of phonological awareness tasks and perception of foreign accentedness and speech comprehensibility as measured by reading aloud task was examined utilizing Pearson product-moment correlation coefficient. Two native and two non-native EFL teachers rated the degree of foreign accentedness and speech comprehensibility. No violation of the assumptions of normality, linearity, and homoscedasticity was reported. As can be seen in Table 2, there was a strong, negative correlation between the learners' phonological awareness and perception of foreign accentedness [ $r$=-.71, $n$=34, $p$=.00], indicating that learners with higher levels of phonological awareness were perceived to have lower degrees of foreign accentedness. According to Cohen's (1988) effect size

guidelines, a Pearson correlation coefficient larger than .50 is regarded to be a large one.

Table 2.
*The Correlation between Phonological Awareness and Foreign Accentedness*

| | | Phonological awareness | Foreign accentedness |
|---|---|---|---|
| Phonological awareness | Pearson Correlation | 1 | -.713** |
| | Sig. (2-tailed) | | .000 |
| | N | 34 | 34 |
| Foreign accentedness | Pearson Correlation | -.713** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 34 | 34 |

**. Correlation is significant at the 0.01 level (2-tailed).

That relationship between phonological awareness and foreign accentedness was then examined in the native and non-native English speaking EFL teachers' ratings and a strong negative correlation was found between the two variables in both cases, [ $r$=-.68, $n$=34, $p$=.00] and [ $r$=-.66, $n$=34, $p$=.00] respectively, although the non-native teachers were slightly more lenient in their ratings. The reliability between the native and non-native teachers with regards to foreign accentedness was calculated via Cohen's Kappa. The level of agreement between the raters was 0.43. Ranging between 0.4-0.6, this value indicates a moderate amount of agreement between the two raters (Phakiti, 2014). The relationship between gender of the participants and perception of foreign accentedness by native and non-native teachers was not significant, however, as seen in Table 3.

Table 3.

*The Correlation between Participants' Gender and their Foreign Accentedness*

| | | Gender | Foreign accentedness |
|---|---|---|---|
| Gender | Pearson Correlation | 1 | .263 |
| | Sig. (2-tailed) | | .132 |
| | N | 34 | 34 |
| Foreign accentedness | Pearson Correlation | .263 | 1 |
| | Sig. (2-tailed) | .132 | |
| | N | 34 | 34 |

The Pearson product-moment correlation coefficient was conducted to assess the relationship between learners' phonological awareness and degree of comprehensibility. As seen in Table 4, there was a strong, positive correlation between the two variables [ $r$=.67, $n$=34, $p$=.00], suggesting the speech of learners with higher levels of phonological awareness was rated more comprehensible. A similar pattern was found in the ratings of native and non-native speaking EFL teachers, [ $r$=.61, $n$=34, $p$=.00] and [ $r$=.64, $n$=34, $p$=.00] respectively. The results suggest that higher levels of phonological awareness were associated with higher levels of comprehensibility on the part of both native and non-native EFL teachers. It should be noted that unlike the correlation observed between phonological awareness and foreign accentedness, the non-native teachers were slightly stricter in their ratings of learners' comprehensibility. The finding is not surprising given the assumption that many L2 teachers are indeed themselves L2 learners and previous research has indicated that L2 learners may judge the speech of fellow L2 learners harder to understand than native speakers in their ratings (e.g., Rossiter, 2009).

Table 4.

*Correlation between Phonological Awareness and Comprehensibility*

| | | Phonological Awareness | Comprehensibility |
|---|---|---|---|
| Phonological Awareness | Pearson Correlation | 1 | .674** |
| | Sig. (2-tailed) | | .000 |
| | N | 34 | 34 |
| Comprehensibility | Pearson Correlation | .674** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 34 | 34 |

**. Correlation is significant at the 0.01 level (2-tailed).

The estimated reliability index between native speaker and non-native speaker with regards to comprehensibility, calculated through Cohen's Kappa, was .49. The value indicates a moderate degree of consistency among native and non-native speaker raters' judgments. It is interesting to note that the correlation between accentedness and comprehensibility was significant [ $r$=-.67, $n$=34, $p$=.00], as seen in Table 5. This suggests the stronger the learners' foreign accent; the less comprehensible they would sound to their listeners. However, the correlation between the participants' gender and comprehensibility, like that of gender foreign accentedness, was not significant [$r$=-.015, $n$=34, $p$=.93].

Table 5

*The Correlation between Foreign Accentedness and Comprehensibility*

| | | Foreign Accentedness | Comprehensibility |
|---|---|---|---|
| Foreign accentedness | Pearson Correlation | 1 | -.679** |
| | Sig. (2-tailed) | | .000 |
| | N | 34 | 34 |
| Comprehensibility | Pearson Correlation | -.679** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 34 | 34 |

**. Correlation is significant at the 0.01 level (2-tailed).

The Pearson product-moment correlation coefficient was also employed to assess the relationship between learners' language proficiency level and their accentedness ratings. As can be seen in Table 6, there was a negative correlation between the two variables [ *r*=-.59, *n*=34, *p*=.00], suggesting that L2 learners with higher levels of language ability were rated as having less of a foreign accent. Such were the results for native and non-native EFL teachers [ *r*=-.52, *n*=34, *p*=.00], [ *r*=-.60, *n*=34, *p*=.00] respectively. It is worth mentioning that non-native EFL teachers rated the speech samples of learners of lower proficiency to be more accented, a finding that aligns well with the finding of Rossiter's (2009) study which showed that L2 learners, in this study non-native EFL teachers, find speech of fellow learners as more accented than native speakers do in their ratings.

Table 6.

*The correlation between Language Proficiency Level and Foreign Accentedness Ratings*

| | | Foreign accentedness | Language proficiency Level |
|---|---|---|---|
| Foreign accentedness | Pearson Correlation | 1 | -.595** |
| | Sig. (2-tailed) | | .000 |
| | N | 34 | 34 |
| Language proficiency level | Pearson Correlation | -.595** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 34 | 34 |

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7 shows the results for the learners' language proficiency level and their comprehensibility ratings; the two variables were positively correlated, with the correlation coefficient for all the teachers being [ *r*=.62, *n*=34, *p*=.00], suggesting that L2 learners with higher levels of language ability were rated as being more comprehensible. The correlations for the native and non-native EFL teachers were [ *r*=.54, *n*=34, *p*=.00] and [ *r*=.62, *n*=34, *p*=.00] respectively. The language proficiency

seemed to play a more important role in the comprehensibility ratings of the non-native teachers; a finding which agrees with that of Rossiter's (2009) study.

Table 7.

*The Correlation between Learners' Language Proficiency Level and their Comprehensibility Ratings*

| | | Language proficiency level | Comprehensibility |
|---|---|---|---|
| Language proficiency level | Pearson Correlation | 1 | .621** |
| | Sig. (2-tailed) | | .000 |
| | N | 34 | 34 |
| Comprehensibility | Pearson Correlation | .621** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 34 | 34 |

**. Correlation is significant at the 0.01 level (2-tailed).

## Discussion

This study investigated how the phonological knowledge of L2 sound system correlates with measures of accentedness and comprehensibility of non-native (L2) speech. It also looked at the relationship between accentedness and perceived comprehensibility of L2 speech. Finally, the study investigated the relationship between the learners' language proficiency and perception of accentedness and comprehensibility. Results showed that there was a strong negative correlation between EFL learners' phonological awareness scores and perception of foreign accentedness by both native and non-native judges. The findings support the view that explicit phonological knowledge is related to differences in perception of learners' accentedness (e.g., Gaballa, 2013; Menzer, 2017; Mora, Rochdi & Kivisto-de Souza, 2014; Riney, 2000). The findings suggest that L2 learners with greater sensitivity to L2 phonological systems are better at

detecting the differences between their interlanguage and native or native-like pronunciations and are also able to utilize that knowledge to eliminate phonological characteristics that make their speech sound accented to listeners. The findings are, however, contrary to those of Park's (2015) research which suggested there was not a significant correlation between the learners' L2 phonological awareness and their accent. There was an exception in her study, nonetheless, and the accented ratings of one experimental sentence correlated highly with phonological awareness.

It was also found that there was a strong relationship between learners' knowledge of English phonological structures and their speech comprehensibility. That phonological awareness can contribute to the higher comprehensibility of adult L2 learners' speech has already been established in previous research (e.g., Munro & Derwing, 1999; Saito, 2011). Venkatagiri and Levis (2007, p. 266) points outs that "a strong positive correlation between phonological awareness and comprehensibility would appear to support Schmidt's (1990) noticing hypothesis", that is, the higher L2 learners' awareness and ability to analyze and understand language structures and patterns, the better their speech would sound to native and non-native listeners. This finding points to the potential benefits of drawing L2 learners' attention to the phonological system of L2 through form-focused instruction (Doughty & Williams, 1998). There is plenty of research indicating that pedagogical intervention that draws learners' attention to formal properties of language is helpful, and perhaps even necessary, to L2 development (Long & Robinson, 1998; Samburskiy & Quah, 2014; Housen & Pierrard, 2005). What is still open to question is precisely how, and to what extent form-focused pedagogical strategies can influence the process. Venkatagiri and Levis (2007) add that although form-focused instruction appears to be successful in the teaching of other language forms (e.g., syntactic and lexical), it has not been shown that the same awareness-building strategies will help L2 learners become more comprehensible.

The study also focused on the relationship of a non-native accent and L2 speech comprehensibility. Results of this study indicated that there was

a strong relationship between the two variables, suggesting that foreign accent can constitute one possible factor in speech comprehensibility differences. The results, however, seemed to confirm earlier studies that the presence of an accent does not necessarily sabotage communicative success (Munro & Derwing, 2002) because only four learners (11.76%) were rated as highly incomprehensible and incomprehensible in total. What future research has to determine is which type of instructional strategies can reduce foreign accent and enhance comprehensibility; we also need to identify which aspects of an accent change will affect more comprehensibility given the importance of comprehensibility over nativeness or nativelikeness as a more attainable goal for L2 within the current English as an international language paradigm (Jenkins, 2000, 2005). Finally, results also showed that learners' English proficiency correlated highly with accentedness and comprehensibility ratings and the correlation was slightly stronger in the non-native teachers' ratings.

It should not be forgotten that the present study was based on a correlational analysis and we cannot conclude that one variable caused a changed in the other. Correlations are symmetrical, that is, variable A could cause variable B to change just as readily as variable B could cause variable A to change. Therefore, we cannot conclude that greater phonological awareness can reduce foreign accent or enhance L2 speech comprehensibility. What is required to reach that conclusion is designing an experimental study to determine whether raising such awareness in learners would help.

## Conclusion

The findings of this study suggest that there is a strong correlation between the learners' phonological awareness and evaluation of their speech accent and comprehensibility, though it remains unclear which component(s) of phonological awareness correlate more with the listeners' judgment of foreign accentedness and comprehensibility. It also has to be determined how the presence of a foreign accent affects L2 learners'

speech comprehensibility. As pointed out by Kirkova-Naskova (2010, p. 41), "not all obvious differences in phonological phenomena are perceived by native-speakers as erroneous: some differences are tolerated and regarded as non-problematic while others are treated as deviant and conducive to unintelligibility and miscommunication." There was also a strong correlation between the learners' L2 proficiency levels and their accentedness and comprehensibility ratings. We recommend researchers interested in this topic also look into how raising phonological awareness of L2 learners with different proficiency levels would interact with their perceived accentedness and comprehensibility. Furthermore, future research should also take into account the role of other factors that contribute to the judgment of foreign accentedness and comprehensibility, factors such as listener-raters' language experience (e.g., familiarity with learners' L1 and with a particular L2 accent), linguistic features (e.g., the influence of segmental versus prosodic aspects), properties of speakers (e.g., rate of speech, type and number of pauses) and lexical, morphological and syntactic errors.

Last but not least, many of the studies investigating L2 learners' speech accentedness, intelligibility and comprehensibility mentioned above hinge on the distinction between native and non-native speakers, listeners and raters. Shepard, Elliot, and Baese-Berk (2017) state that the distinction might imply that the evaluations of native speakers provide an appropriate standard to measure accentedness, intelligibility, and comprehensibility in non-native speakers, an assumption that may not be appropriate given the fact that in today's' world much of the communication in English occurs among non-native speakers (Jenkins, 2002). Murphy (2014) proposes mutual comprehensibility among non-native speakers of English as a more appropriate standard, and we hope future research in this area takes that standard into account.

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## Appendix

The set of phonological awareness tasks, the number items, and scoring procedure for each task.

| Skills | Tasks | Instruction | Task type | K | Scoring procedure |
|---|---|---|---|---|---|
| **Generation** | Name as many words as you can in 30 seconds in rhyme with given the word. | Oral | Stimulus: Tend Expected response: e.g., Bend, Mend, Send | 10 | **Participants received 1 point for each correct word. Non-words did not receive points.** |
| **Categorization** | Categorize the words that rhyme. | Written | Stimulus: Cow, How, Sow Expected response: categorize cow & how as rhyming together, and cross the 'sow' out | 10 | **There were five sets of words, each containing four collections to be categorized. Each complete categorization received 1 point. Putting a wrong word in the category caused losing of the point.** |
| **Odd one out** | Identify and checked off the two words that you think are alliterated | Written | Stimulus: coat, kale, cell expected response: 'cell' should be the odd one out | 10 | **Participants received 1 point for each correct choice.** |

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|---|---|---|---|---|---|
| **Syllabic reversal task** | Reverse syllables of multi-syllable words | Written | Stimulus: given Expected response: engiv | 15 | **Participants received 1 point for each correct reversal.** |
| **Number the sounds** | Tell the number of sounds in given written words | Written | Stimulus: Detest Expected response: 6 sounds (dɪˈtɛst, transcription was not required) | 15 | **Participants received 1 point for each correct number.** |
| **Phoneme blending** | Write the word/syllable after hearing the sounds separately | Oral | Stimulus: ˈnutrəl Expected response: Neutral (written form or spelling is not required) | 10 | **Participants received 1 point for each item that they responded correctly. It was not needed to know the meaning of words.** |
| **Deleting** | Remove initial/final consonant/vowel of a word, then utter it | Oral | Stimulus for initial deletion: Plead Expected response: lead Stimulus for final deletion: Grasp Expected response: grass | 10 | **Participants received 1 point for each item pronounced correctly.** |
| **Adding** | Add an initial consonant to given syllable to make sensible words | Oral | Stimulus: Rift Expected response: Drift | 10 | **Participants received 1 point for each correct word they utter. Non-words did not receive points.** |
| **Substituting** | **Substitute added initial consonant with another one to make a new word** | **Oral** | **Stimulus: drift (from the previous section) Expected response: Thrift** | **10** | **Participants received 1 point for each correct word they utter. Non-words did not receive points.** |