Intelligibility of Language Learners to Native Speakers: Evidence from Iranian ESL Learners Conversing with Canadians

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ABSTRACT

This study attempted to investigate the extent to which phonological characteristics of Farsi interfere with Iranian ESL learners' intelligibility when they interact with Canadian native English speakers. Most Iranians who learn English as a foreign or a second language would face phonologically-based difficulties that affect their comprehensibility when they communicate with native speakers. This study utilized a sample of five Iranian ESL learners and five Canadian native speakers as participants. Through the study, Iranian ESL learners underwent an interview and were asked to read twenty paired sentences that contained missing vowels and consonants in Farsi, and ten sentences including consonant clusters aloud while being tape recorded. Then, Canadian native speakers were invited to listen to the tape and declare their degrees of perception accordingly. The findings demonstrated that the phonemes and consonant clusters which do not exist in the Farsi phonological system and the difference in syllabic construction of two languages caused difficulties for Iranian ESL learners to be comprehended to a varying degree.

Keywords: *Intelligibility, Phonological system of Farsi and English, ESL learners, Interaction, Contrastive analysis*

1. Introduction

A major difficulty facing almost any ESL/EFL learner is the achievement of an acceptable pronunciation that enables them to be understood by native speakers. In fact, many of these learners may master the elements of English such as syntax, morphology, or even semantics to the level of almost 'native-like' competence but often fail to master phonology. According to Avery and Ehrlich (1992, p. 34) the nature of a foreign accent is determined to a large extent by the learners' L1. In other words, the sound system and syllabic structure of the L1 have some impacts on the pronunciation of the target language sentences.

Observation of a foreign or a second language pronunciation errors and difficulty of being understood by native speakers would suggest the critical need for ESL/EFL teachers to become more aware of the impact of learners' L1 phonological systems and the syllabic construction rules that would be brought to English learning context. To achieve this awareness, a phonological Contrastive Analysis of learners' L1 and English, as the target language, can provide ESL/EFL teachers with helpful pedagogical insights. In better words, with the application of a contrastive analysis, ESL/EFL teachers can find out on which particular phonological characteristics of English they should concentrate. Contrastive analysis contributes to teachers' knowledge of the existing relationships among different language systems and 'therefore, many language teachers from every part of the world would find Contrastive analysis useful in dealing with the learning difficulties of their students, especially in phonological aspects of the language' (Hall, 2007).

Although *Contrastive Analysis Hypothesis* (CAH) has been seriously criticized for decades, many linguists and phonologists have documented its efficacy in comparing different language systems and relating them together and employed it widely in determining the areas of difficulty for foreign and/or second language learners
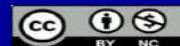
in their recent studies (e.g. Fraser, 2000; Collins & Mees, 2003; Yavas, 2006).

It is worth mentioning that there is no evidence that any research has ever been conducted relating to the intelligibility of Iranian ESL learners when they interact with native English speakers. However, there have been some similar studies conducted in this field on the intelligibility of Portuguese, German, and Korean learners of English in similar and dissimilar sounds by other researchers such as Major (1987) who completed a study on Portuguese learners of English, Bohn and Flege (1992) who conducted a research on advanced German learners of English, and Major and Kim (1999) who completed a study on beginning and advanced Korean learners of English.

It should be noted that the focus of this study is only on the segmental features of phonology which contribute to 'naturalness' and intelligibility of the language. However, suprasegmental features have a contribution to intelligibility of ESL/EFL learners which cannot be denied; although, according to Joze Tajareh (2015) during conversation some conversers may not be able distinguish suprasegmental features such as intonation, pitch, and stress without being influenced by segmental substitutions of their first languages. This study explored the extent to which phonological characteristics of Iranian ESL learners' L1 interfere with Canadian English speakers' perceptions and tried to answer the following research questions,

1. Do Farsi phonological characteristics interfere with Iranian ESL learners' intelligibility when they interact with native Canadian English speakers?

2. To what extent Canadian native English speakers' perceptions are influenced by Iranian ESL learners' pronunciations?

2. Literature Review

In this section, the researcher has provided a short overview of the CAH in addition to the backgrounds of the Farsi and English syllabic structures and sound systems. As a result of a comprehensive comparison, the problematic areas that are responsible for pronunciation errors of Iranian ESL learners would be identified.

2.1 Contrastive Analysis Hypothesis

Comparing one language with another is not new in linguistics; many linguists have been comparing languages as they are used today to determine the differences and similarities between them. Since the 1940s, this kind of activity has been referred to as contrastive analysis. Contrastive analyses focus on the comparison and contrast of two languages and contribute to our knowledge of language structure and of the relations obtained between language systems. CAH is based on the premise that the errors a second or a foreign language learner makes which are attributable to the differences between the structure of his/her mother tongue and that of the target language, can be predicted before the commencement of any pedagogical program.

The supporters of the principle of transfer in second/foreign language learning assume that the learning of similar items of L1 and L2 (sounds, words, structures, and cultural items) is easy while it is not the case for the different L1 and L2 linguistic patterns and the degree of this difficulty depends on the degree of differences between the two languages. This assumption was later labelled as the strong version of the CAH, and it was credited with being the version that was able to be helpful in predicting the difficulties and errors of second/foreign language learners. For instance, Behforouz and Joghataee (2014, p. 1872) noted, "the greater the differences between the first and target languages are, the more acute the learning difficulties will be".

The most recognized attempt to formalize the prediction stage of CAH is made by Stockwell, Bowen, and Martin (1965, p. 15) who constituted a hierarchy of difficulty by which a teacher or linguist may recognize which kinds of differences will be the most difficult to master and which will be easiest, in order to allow them to grade their teaching materials, arrange them in a sequence that is most effective, and decide how many drills are needed on each point of the hierarchy. To achieve this, for phonological systems they suggested eight possible degrees of difficulties that were based upon the principles of transfer and of optional and obligatory choices of certain phonemes. Based on the same principles, they constructed a hierarchy of difficulty for grammatical structure which contains sixteen levels of difficulty. It should be noted that, though Stockwell and his associates devised their hierarchy for English and Spanish, they claimed that the hierarchy had a universal application.

Two years after Stockwell and his associates, another linguist (Prator, 1967, p. 195) condensed this grammatical hierarchy into six levels in an ascending order of

difficulty and stated that this grammatical hierarchy is also applicable to the phonological features of language; *Transfer* (there is no difference or contrast in sounds, lexical items, or structures between the two languages), *Coalescence* (two or more items in the L1 amalgamate into one item in the target language), *Underdifferentiation* (the equivalent item in the L1 is absent in the L2), *Reinterpretation* (an item that exists in the L1 is given a new shape or distribution in the L2), *Overdifferentiation* (a new item in the L2 is completely absent from the L1), *Split* (an item in the L1 separates into two or more items in the L2).

Considering the heated controversy surrounding CAH, it is worth mentioning that most of the criticisms are associated with the realm of language teaching, while many linguists from all around the globe find CAH quite useful in dealing with comparing different languages, relating them together and predicting possible difficulties of language learners, especially in the phonological aspects.

2.2 Farsi and English syllabic structures in contrast

According to Windfuhr (1979, p. 529), Farsi is characterized as a syllable-timed language, i.e., the syllables are said to occur at approximately regular intervals of time, and the amount of time it takes to say a sentence depends on the number of syllables in the sentence, not on the number of stressed syllables as in stress-timed languages like English and German. Farsi syllables take one of the patterns presented in following table.

Table 1: Farsi Syllabic Structures

Farsi Syllabic structure	Examples	Meaning in English
CV	ba /bɒ/	with
CVC	bad / bɒd/	wind
CVCC	sard /særd/	cold

As shown in Table 1, the syllable structure of Farsi can only be presented as CV(C)(C) which identifies that Farsi syllables cannot be initiated with vowels, even words that start with a vowel include the glottal stop /ʔ/ as the syllable onset: e.g. "abru" /ʔæbru/ meaning "eyebrow" in English. Another interesting observation is that syllable-initial consonant clusters are impossible in Farsi and syllable-final consonant clusters normally take no more

than two consonants in their structure (Hall, 2007). According to Windfuhr (1979), in English as a stressed-timed language the amount of time it takes to say a sentence depends on the number of syllables that receive stress. In English, possible syllable structures can be represented as (C)(C)(C)V(C)(C)(C)(C) where parentheses indicate variant insertion. This means that English permits up to three consonant clusters initially and four finally. Table 2 depicts the possibility of consonant-vowel combinations to construct English syllables.

Table 2: English Syllabic Structures\

English syllables	Example	English syllables	Example	English syllables	Example
V	I	CVCC	cattle	CCVCCCC	trampled
VC	is	CVCCC	packs	CCCV	spree
VCC	east	CCV	true	CCCVC	street
VCCC	asks	CCVC	stir	CCCVCC	script
CV	she	CCVCC	speaks	CCCVCCC	strands
CVC	bit	CCVCCC	brands	CCCVCCCC	scrambles

As presented in the Table 2, English offers 18 possibilities of consonant-vowel combination for syllable construction while Farsi has just 3 possibilities (6 times fewer than English). Furthermore, in English unlike Farsi, consonant clusters can occur in both syllable-initial (onset) and syllable-final (coda) positions. Moreover, unlike many languages such as Farsi, consonant clusters in English are not limited to two consonants, but they permit up to three consonant clusters initially and four finally. Additionally, English permits vowels to initiate syllables in contrast to Farsi.

2.3 Farsi and English sound systems in contrast

Farsi alphabet is a consonantal system and contains thirty two letters: twenty three consonants and six vowels. Of the six vowels, there are three lax vowels (/ɒ/, /e/, /o/) and three are tense vowels (/æ/, /i/, /u/) as well as two diphthongs /ei/, /ou/ and a total of twenty nine phonemes (Windfuhr, 1979, p. 526 & Samareh 2000, p. 85). The classification of Farsi consonants according to place of articulation and manner of articulation is given in Table 3.

### Table 3: Farsi Consonants, International Phonetic Alphabet (IPA), 1999, p. 124

	Bilabial	Labiodent.	Dental	Postalv.	Palatal	Velar	Glottal
Plosive	p b		t d			k g	ʔ
Nasal	m		n				
Fricative		f v	s z	ʃ ʒ		x ɣ	h
Affricate				tʃ dʒ			
Trill			r				
Approximant					j		
Lateral Approximant			l				
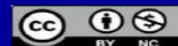
As Table 3 suggests there are two nasals in the Farsi consonantal system: /m/ and /n/ which are categorized as plain voiced nasals; /m/ is bilabial, whilst /n/ has dental-alveolar articulation. There are also two affricates /ʧ/ and /dʒ/ which are voiceless and voiced respectively and have post alveolar articulation. In addition, of the seven plosives /p/, /b/, /t/, /d/, /k/, /g/, /ʔ/ in the horizontal column, /p/, /t/, /k/ are voiceless and strongly aspirated in all positions; /g/ and /b/ are voiced and slightly palatalized initially and medially before front vowels and in syllabic-final position; /d/ and /t/, voiceless and voiced, have dental-alveolar articulation, and /ʔ/ is voiceless glottal post-velar. Farsi has nine fricatives as follows, /f/, /v/, /s/, /z/, /ʃ/, /ʒ/, /χ/, /ɣ/, /h/; four fricatives of /f/, /v/, /χ/, /h/ are plain and the rest are complex; /v/, /z/, /ʒ/ are voiced, whilst /f/, /s/, /ʃ/, /ɣ/, /χ/, /h/ are voiceless. However, when /ɣ/ occurs at the beginning of a word and after nasals, it is realized as a voiced uvular plosive [G] as in 'ghabul' /Gæbul/ meaning "acceptance"; otherwise, it is postvelar as in 'maghbul' /mæɣbul/ meaning "accepted". In addition, /s/ and /z/ have dental alveolar articulation (Windfuhr, 1979; Hall, 2007).

Consonants and vowels are the basic elements of the sound system of each language and the difference in pronunciation of a word uttered by speakers of different languages is mainly due to the variations in vowels and the way they are pronounced. As mentioned previously, Farsi has six distinct vowels demonstrated as three lax vowels (/ɒ/, /e/, /o/) and three tense vowels (/æ/, /i/, /u/). Since the lax vowels are not inscribed in Farsi, they can be pronounced with different vowel combinations which may create ambiguities for the learners of Farsi. Moreover, Farsi vowels do not have any variation in length in formal speech; however, in informal speech when vowel length changes due to compensatory lengthening, the meaning of the word will not be affected. Farsi vowels are given in Figure 1.

Figure 1: Farsi Vowels, International Phonetic Alphabet (IPA), 1999, p. 124
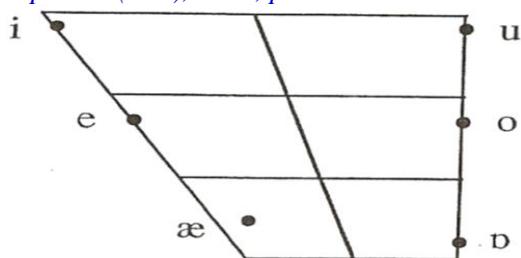
As shown in Figure 1, of the three tense vowel sounds (/æ/, /i/, /u/), /æ/ is a mid-front unrounded vowel which rarely occurs in word-final except for in /næ/ meaning "no"; /i/ is a high-front-unrounded vowel, and /u/ is a high-back-round sound. In addition, of the three lax vowels (/ɒ/, /e/, /o/), /ɒ/ is a low central unrounded vowel; /e/ is a mid-front-unrounded sound that also can be considered as a tense mid-front vowel depending on whether it is in an unstressed position or a stressed one, and finally, /o/ is a mid-back sound which does not occur frequently except for the pronoun "to" /to/ meaning "you".

English alphabet is based on Latin which contains twenty six letters: twenty-four consonants; twelve vowels; eight diphthongs and a total of 44 phonemes (Sousa, 2005, p. 37). It is worth mentioning that some other authorities vary slightly from this, but the number of phonemes is between 43 and 45 (Hall, 2007). The classification of English consonants according to place of articulation and manner of articulation is given in Table 4.

Table 4: English Consonants, International Phonetic Alphabet (IPA), 1999, p. 41

|	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar	Glottal
Plosive	p b			t d			k g	
Affricate					ʧ dʒ			
Nasal	m			n			ŋ	
Fricative		f v	θ ð	s z	ʃ ʒ			h
Approximant				r		j	w	
Lateral Approximant				l				

As shown in Table 4, of the six plosives /p/, /b/, /t/, /d/, /k/, /g/ in the horizontal column, /p/, /t/ and /k/ are voiceless; aspirated initially and medially before a stressed vowel in syllable-initial position and un-aspirated finally; medially after /s/ as in 'spy', 'sty', and 'sky', and before unstressed vowels. Voiceless /k/ and voiced /g/ are slightly palatalized before front vowels. Voiceless /t/ and voiced /d/ have dental-alveolar articulation. Another observation is that English has nine fricatives, /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /h/. The first five are plain and the rest are complex; moreover, /v/, /z/, /ð/, /ʒ/ are voiced and the rest are voiceless. In addition, /s/ and /z/ have alveolar articulation. Table 5 also depicts that there are three nasals (/m/, /n/, /ŋ/) in the English consonantal system which are categorized as plain voiced nasals. /m/ is bilabial; /n/ has dental-alveolar articulation, and /ŋ/ as a velar occurs finally as in "sing" /sIŋ/; There are also two affricates /ʧ/ and /dʒ/ which are voiceless

and voiced respectively and have post alveolar articulation.

In considering the phoneme /r/, after researching numerous resources, it was concluded that there is no agreement amongst the authors as to the number of allophones for the phoneme /r/. Furthermore, the phoneme /r/ along with /j/ and /w/ are considered as approximants which are complex; /j/ has palatal, and /w/ has velar articulation. Finally, in the bottom row of Figure 2, there is one phoneme /l/ which has four allophones in English. Of these four allophones, two occur more frequently: clear /l/ that occurs initially as in "lamp" and after voiced consonants as in "blast"; dark /l/ which occurs finally as in "canal" and inter-vocalically as in "milk". After covering the twenty-four consonants in English sound system, English vowels are discussed here. It should be noted that there is disagreement amongst phoneticians on the number of vowels that exist in English. Some signify that there are twelve; the majority classifies them as eleven. Figure 2 presents the English vowels.

Figure 2: English Vowels, International Phonetic Alphabet (IPA), 1999, p. 42
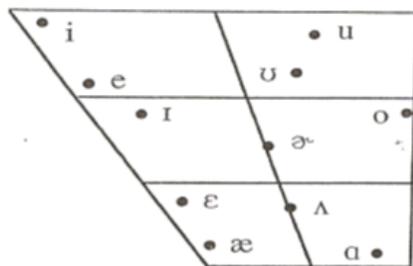
As shown in Figure 2, of the eleven English vowels, /i/, /e/, /ʊ/, /u/ are high; /I/, /o/, /ə/ are mid, and /ʌ/, /ɛ/, /æ/, /ɑ/ are low; moreover, /i/, /ə/, /u/, /o/ are tense, whilst all others are lax. It should also be pointed out that English does have variation in vowel length; therefore, there are two major types of vowels (long and short) on the basis of their length. Long vowels are usually noticeable from short vowels in the duration of time that speakers spend in articulating them. In English, there are three long vowels (/i/, /u/, /o/) and seven short vowels (/ɛ/, /ə/, /ʌ/, /ɑ/, /I/, /ʊ/, /æ/) which lack the length features. As can be seen, neglecting different allophones of some consonants, English has three consonants which are totally absent in Farsi, i.e. /ɵ/, /ð/, /ŋ/. As vowel sounds are concerned the difference is much more; in English vowel system, there are eleven or twelve different vowels identified; whereas, Farsi has only 6 vowels in its vowel inventory. Farsi lacks 6 of English vowel sounds (/I/, /ɛ/, /ʌ/, /ʊ/, /ə/, /ɚ/) which are

mostly short lax sounds. Figure 3 presents this difference.

Figure 3: Comparison between English and Farsi Vowels (Yavas, 2006, p. 197)
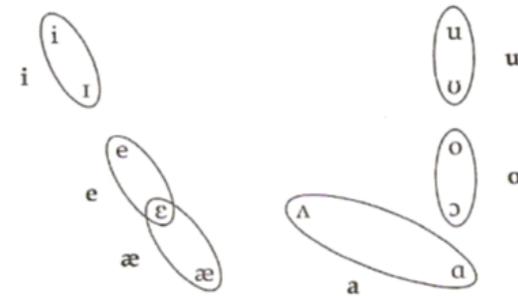
Farsi has two diphthongs (/eI/, /ow/) and lacks 7 of English diphthongs (/Iə/, /eə/, /aI/, /ʊə/, /əʊ/, /ɔI/, /aʊ/) and all its triphthongs (/eIə/, /aIə/, /ɔIə/, /aʊə/, /əʊə/) (Hall, 2007). Figure 4 shows English diphthongs.

Figure 4: English diphthongs, International Phonetic Alphabet (IPA), 1999, p. 42
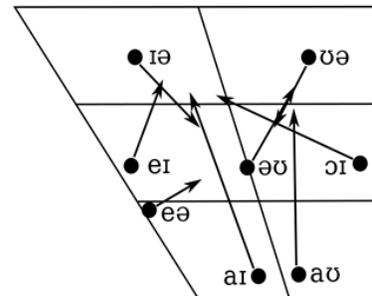
Another characteristic that typically differentiates the English vowel system from the Farsi vowel system is whether there is a distinction between lax and tense vowels in either of the two systems. As shown in Figure 4, the tense/lax vowel pairs in English such as /i/ vs. /I/, /e/ vs. /ɛ/, /u/ vs. /ʊ/ do not exist in the six-vowel system of Farsi.

CAH's deduction would be that considering Farsi's six-vowel inventory sound system, Iranian English learners will face difficulties in producing English vowels that do not exist in Farsi vowel system. For instance, in Farsi, /i/ is similar to the close-front-tense /i/ in English but /I/, which is a half-close, front-lax vowel in English is absent in Farsi. Thus, the result will be the use of /i/ instead of /I/ which would create misunderstanding and in some cases embarrassment. For example, some may pronounce the words 'bit' and 'beat' the same. This story may also happen in many other words such as, 'eat/it, keen/kin, seen/sin, heat/hit, least/list and cheap/chip'. In addition, in English, /æ/ is an open-low-front vowel which does not correspond exactly with the Farsi equivalent. Therefore, Iranian students tend to use /ɒ/ instead, in
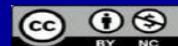
which the mouth is not as open as in English. Moreover, /ʌ/ a mid-lax-central vowel; /ɔ/a mid-low-back vowel, and /ʊ/ a high-back-lax vowel in English do not exist in Farsi. Finally, /e/ in Farsi corresponds to the English vowels /ɛ/ and /e/ depending on whether it is in either a stressed or an unstressed position. Thus, it is quite probable that vowel distinctions made by the change of tongue positioning between Farsi and English vowels may cause problems for Farsi speakers of English.

3. Methodology

The research in the area of contrastive Analysis of English and Farsi syllable structures and sound systems is currently limited and more research is needed to identify the problematic areas that are responsible for pronunciation errors of Farsi speakers of English. Few studies have ever been conducted that examines the extent to which phonological characteristics of Farsi speakers of English interfere with their intelligibility when they interact with native speakers (e.g. Hall, 2007). In fact, ESL/EFL learners in Iran have difficulties in pronunciation that have an effect on their intelligibility when they interact with native speakers.

3.1 Participants

There were two distinctive groups of participants taking part in this study. The first group consisted of five adult male/female Iranian ESL learners between the ages of 23 to 28 who were postgraduate students of Memorial University (MUN) of Canada. Members of this group had experienced similar amount of formal English instruction in Iran and were asked to attend one year of English learning classes before the commencement of their official education at MUN. The second group of participants consisted of five Canadian male/female M.A students of linguistics between the ages of 24 to 31 who had lived in Canada all of their lives.

3.2 Instruments

For Iranian participants three tasks were designed while a recorder was used to record the Iranian participants' voices, to be played back by the Canadian native speakers to interpret what had been said.

Firstly, an unstructured interview consisting of five open-ended questions relating to the topic of how the Iranian students felt about their time in Canada was used to check phonological characteristics of Iranian English learners

Secondly, Iranian ESL learners were asked to read aloud a set of twenty English sentences including specific words containing the consonants and vowels Farsi lacks in comparison with English and have been identified as the possible problematic sounds for Iranian ESL learners to pronounce.

Finally, Iranian ESL learners were asked to read another set of ten English sentences aloud. These sentences contained consonant clusters which were identified as another problematic area of English pronunciation for Iranian ESL learners by CAH.

After the participation of Farsi speakers of English, the tape recording of the results was given to each of the Canadian native speakers to interpret what had been said by Iranian ESL learners. Firstly, after listening to the interview of each Iranian ESL learner, Canadian native speakers were asked to rate Iranian ESL learners from best to worst (giving the reasons why) based on their intelligibility. Then, Canadian participants were given twenty pairs of sentences in a limited multiple choice format including minimal pairs, half being identical to the sentences given to Iranian ESL learners to be read aloud. The Canadian participants were asked to mark one of the paired sentences provided whilst listening to the tape recording. Finally, a list of ten sentences, each with some missing words including consonant clusters was given to Canadian native speakers to fill in the missing words as they had understood them whilst listening to the tape recording of each individual Farsi speaker of English.

3.3 Procedure

In the beginning of the research process, the participants were informed of the purpose of the study and that their identities would be kept confidential in the research report. Each participant was given an information sheet and a consent form that they were required to read and sign. The study commenced with an interview of unstructured spontaneous speech in the form of five open-ended questions for the Iranian ESL learners with the topic of how they felt about their time in Canada. Next, by using the elicited speech method, participants were asked to read aloud a set of twenty English sentences to demonstrate the likelihood of pronunciation errors as Farsi's missing consonants and vowels were concerned and finally, the participants were asked to read

aloud ten English sentences to demonstrate the likely pronunciation errors in consonant clusters.

The next stage commenced with the Canadian speakers listening to five interviews, and then answering three open-ended questions relating to these interviews. Next, the native participants were asked to listen to twenty sentences which were read aloud by Iranian participants and subsequently, they were asked to select and mark one of the pairs of sentences provided to indicate the sentence that they had heard whilst listening to the tape recording. Finally, after listening to ten sentences read by Iranians, the Canadian participants were asked to write down the missing words from ten sentences provided as they had understood them whilst listening to the tape recording.

4. Data Analysis and Discussion

In this section, the five Canadian participants (identified as C1, C2, C3, C4, and C5) were asked to listen to five unstructured interviews Iranian ESL learners (identified as A, B, C, D and E) concerning their feeling in Canada. They were also asked to rate Iranian participants based on their intelligibility.

 # C1: Sara (age, 24) C1 rated "speaker B" as the best speaker and "speaker E" as the worst speaker. Moreover, this participant mentioned that "speaker C spoke too quickly to be understood". Overall, C1 rated the five Iranian ESL learners from best to worst as follows, B, D, A, C and E.

#C2: Louise (age, 31) C2 rated "speaker D" as the best speaker and supported this view by stating that "speaker D had the least accent". In addition, C2 stated that, "speaker B expresses ideas more clearly [and] speaker C [is] better than [speaker] A". He continued "E is undoubtedly the worst to the speaker's strong accent". Overall, C2 rated the five Iranian ESL learners from best to worst as follows, D, B, C, A and finally E.

#C3: Noami (age, 26) C3 rated "speaker B" as the best speaker and supported this view by mentioning that "speaker B" was a confident English speaker. Moreover, "speaker E" was rated as the worst speaker by C3 due to the volume of speech and limited English vocabulary. In addition, C3 mentioned that "speaker D" had a wide range of vocabulary and spoke very clearly, but with a slight accent, while, "speaker A" had a good grasp of English and spoke quietly but quickly. Overall, C3

rated the five Iranian participants from best to worst in this way, B, D, A, C and E.

 # C4: Brittney (age, 29) C4 rated "speaker B" as the best speaker and stated that "speaker B was the best as she was very confident when she spoke and had a good grasp of spoken English". She continued, "Speaker E was the worst due to the accent that made the conversation difficult to understand. In addition, C4 specified that, "speaker D was a close second behind "speaker B" as she could express herself better than the others". In considering "speaker C", C4 mentioned that this speaker was less confident and paused to think often. Overall, C4 rated Iranian ESL learners as follows, B, D, C, A and E.

 # C5: Mike (age, 27) C5 determined "speaker B" as the best and "speaker E" as the worst. He announced that "speaker D" was also good but not better than "speaker B". He continued, "Speakers C and A were very similar in accent but C was more fluent". He rated Iranian participants in the order of B, D, C, A, and finally E.

Table 5 summarized the Canadian native speakers' points of view about Iranian participants. As the table suggests, "speaker B" is recognized as the most intelligible Iranian participant to five native speakers while "speaker E" was the least comprehensible to the Canadian jury.

Table 5: Summary of the findings of five unstructured interviews of Iranian ESL learners

Canadian Participants						
Iranian ESL learners	C1	C2	C3	C4	C5	Overall results
Speaker A	third	fourth	third	fourth	fourth	**Fourth**
Speaker B	best	second	best	best	best	**Best**
Speaker C	fourth	third	fourth	third	third	**Third**
Speaker D	second	best	second	second	second	**Second**
Speaker E	worst	worst	worst	worst	worst	**Worst**

The second step was the analysis of native participants' intelligibility for the sentences read by Iranian ESL learners. Canadian participants were given twenty pairs of statements including the minimal pairs and were asked to mark one of the paired sentences as the sentence they had heard. It should be noted that the minimal pairs in these sentences contained specific consonants and vowels which were supposed to cause difficulties for Iranian ESL learners in being understood by the native speakers. For instance, one of these paired sentences were, "I live here/ I leave

here". After collating data from Canadian participants, the researcher analyzed and tabulated the gained information into five separate tables (identifying each Iranian participant). Table 6 is the summary of these five tables in which "T" refers to proper intelligibility of native speakers and "F" shows the lack of native speakers' intelligibility for the sentences read by Iranian participants.

Table 6: Summary of the analysis of twenty paired sentences including minimal pairs

Iranian ESL Learners		Canadian Participants					Total	Percentage
		C1	C2	C3	C4	C5		
Speaker A	T	10	12	14	10	11	57	57%
	F	10	8	6	10	9	43	43%
Speaker B	T	15	15	12	13	14	69	69%
	F	5	5	8	6	7	31	31%
Speaker C	T	9	12	12	11	12	56	56%
	F	11	8	8	9	8	44	44%
Speaker D	T	13	12	14	13	13	65	65%
	F	7	8	6	7	7	35	35%
Speaker E	T	8	7	10	6	7	38	38%
	F	12	13	10	14	13	62	62%

Average of correct percentage: 57%   Average of incorrect perception: 43%

As Table 6 reveals, it was ascertained that "speaker B" could be understood the best by the five Canadian participants by 69% of comprehensibility. "Speaker D" was rated the second best by 65%, while "speakers A and C" performed similarly by 57% and 56% of intelligibility respectively, and finally "speakers E" was the least intelligible with a joint rating of 38%. In order to be more specific and to evaluate CAH's claim, the researcher also focused on two consonants of /Ө/, /ð/, four vowels of /I/, /℧/, /ʌ/, and /ɔ/, and three diphthongs of /eə/, /ɔI/, /Iə/ which do not exist in Farsi sound system. One existing consonant /ʧ/ and one present vowel sound /æ/ in Farsi were also examined, to makes it possible to compare native participants' perceptions of missing and existing phonemes in Iranian participants' L1. Table 7 summarized native speakers' intelligibility of /Ө/, /ð/, /ʧ/.

Table 7: Summary of the analysis of problematic consonants uttered by the Iranian ESL learners

Consonants pronounced by Speaker A

		Canadian Participants					Percentage
		C1	C2	C3	C4	C5	
ʧ	Perceived as /ʧ/	4	4	3	4	4	95%
	Perceived as /dʒ/	0	0	1	0	0	5%
Ө	Perceived as /Ө/	2	3	2	3	3	56%
	Perceived as /t/	2	1	2	1	1	44%
ð	Perceived as /ð/	1	2	1	1	2	35%
	Perceived as /d/	3	2	3	3	2	65%
Out of 4					Av. of correct perception of missing consonants		46%

Consonants pronounced by Speaker B

		C1	C2	C3	C4	C5	Percentage
ʧ	Perceived as /ʧ/	4	4	4	4	4	100%
	Perceived as /dʒ/	0	0	0	0	0	00%
Ө	Perceived as /Ө/	2	2	3	2	3	60%
	Perceived as /t/	2	2	1	2	1	40%
ð	Perceived as /ð/	2	2	1	2	1	40%
	Perceived as /d/	2	2	3	2	3	60%
Out of 4					Av. of correct perception of missing consonants		50%

Consonants pronounced by Speaker C

		C1	C2	C3	C4	C5	Percentage
ʧ	Perceived as /ʧ/	4	4	3	4	4	95%
	Perceived as /dʒ/	0	0	0	1	0	5%
Ө	Perceived as /Ө/	2	2	2	2	2	50%
	Perceived as /t/	2	2	2	2	2	50%
ð	Perceived as /ð/	2	1	1	1	1	30%
	Perceived as /d/	2	3	3	3	3	70%
Out of 4					Av. of correct perception of missing consonants		40%

Consonants pronounced by Speaker D

		C1	C2	C3	C4	C5	Percentage
ʧ	Perceived as /ʧ/	4	4	4	4	4	100%
	Perceived as /dʒ/	0	0	0	0	0	00%
Ө	Perceived as /Ө/	3	3	2	3	3	70%
	Perceived as /t/	1	1	2	1	1	30%
ð	Perceived as /ð/	2	2	1	2	1	40%
	Perceived as /d/	2	2	3	2	3	60%
Out of 4					Av. of correct perception of missing consonants		55%

Consonants pronounced by Speaker E

		C1	C2	C3	C4	C5	Percentage
ʧ	Perceived as /ʧ/	4	4	3	4	3	90%
	Perceived as /dʒ/	0	0	1	0	1	10%
Ө	Perceived as /Ө/	1	1	1	2	1	30%
	Perceived as /t/	3	3	3	2	3	70%
ð	Perceived as /ð/	1	1	0	0	1	15%
	Perceived as /d/	3	3	4	4	3	85%
Out of 4					Av. of correct perception of missing consonants		22%

As Table 7 suggests, the overall correct perception of Canadian native speakers for the absent consonants was 43% while they perceived /ʧ/ 96% of the time correctly. Definitely, this less-than-half intelligibility of missing consonants affects interaction of Iranian ESL/EFL learners negatively. This was in accordance with CAH's claim; absent consonants in learner's L1 would bring about problematic pronunciations in the target language. The findings also attested Canadian participants' declarations in unstructured interview phase; Iranian ESL learners were more or less in the same order of intelligibility except for "speaker D" who outperformed "speaker B" with the average of 55% of correct perception. "Speaker E" is recognized as the least intelligible again with the average of 22% while "speaker A" and "speaker C" became the third and the fourth intelligible with the average of 46% and 40%, respectively. Another finding was that /ð/ (with the average of 32% of correct perception) was more difficult than /Ө/ (with the average of 56% of correct perception) for Iranian participants to pronounce. The interesting point was that this order difficulty in pronunciation was the same for all Iranian participants.

In the Table 8, the researcher has presented the detailed results of the intelligibility analysis for Farsi's four absent vowel sounds (/I/, /℧/, /ʌ/, and /ɔ/), three missing diphthongs (/eə/, /ɔI/, /Iə/) as

perceived by the five native participants for each Iranian ESL learner. Vowel (/æ/) was also examined to see whether this present vowel in Farsi brings about any difficulty for native speakers' intelligibility. Based on the obtained results, Iranian ESL/EFL learners had much more difficulty for the pronunciation of absent vowels and diphthongs than absent consonants in their L1. The overall average of native participants' intelligibility for the absent sounds was only 38% which seems to be insufficient for a meaningful interaction establishment. Native participants perceived /æ/ correctly 92% of the time. Amongst the missing vowels and diphthongs, /I/ was shown the easiest to pronounce by the average of 61% of correct perception while /ɔ/ was the most problematic with 17% of correct perception. Among diphthongs /eə/ was the most difficult for Iranian participants with 26% of correct perception and /ɔI/ was as challenging as /Iə/ with 47% of intelligibility. These sounds can be ordered in terms of difficulty to pronounce as follows, /ɔ/, /eə/, /ʌ/, /ɔI/, /Iə/, /ʊ/, /I/ and finally /æ/.

Table 8: Summary of the analysis of vowels and diphthongs spoken by Iranian ESL learner

Vowels and diphthongs spoken by Iranian ESL learners		Canadian participants					Percentage
		C1	C2	C3	C4	C5	
Speaker A	/I/	75%	75%	50%	75%	75%	70%
	/ʊ/	50%	50%	50%	50%	50%	50%
	/ʌ/	50%	25%	50%	50%	50%	45%
	/ɔ/	00	25%	25%	25%	00%	15%
	/æ/	75%	100%	100%	75%	100%	90%
	/eə/	25%	25%	25%	25%	25%	25%
Av. Of correct perception 45%	/ɔI/	50%	50%	50%	50%	50%	50%
	/Iə/	50%	25%	50%	50%	25%	40%
Speaker B	/I/	75%	75%	75%	75%	75%	70%
	/ʊ/	50%	75%	50%	50%	50%	55%
	/ʌ/	25%	25%	25%	25%	50%	30%
	/ɔ/	25%	25%	25%	25%	25%	25%
	/æ/	100%	100%	75%	100%	100%	95%
	/eə/	25%	25%	50%	25%	50%	35%
Av. Of correct perception 52%	/ɔI/	50%	25%	50%	50%	50%	45%
	/Iə/	50%	50%	50%	25%	50%	45%
Speaker C	/I/	75%	50%	50%	75%	50%	60%
	/ʊ/	50%	50%	25%	50%	25%	40%
	/ʌ/	25%	25%	25%	25%	25%	25%
	/ɔ/	00	25%	00	00	00	5%
	/æ/	100%	75%	75%	100%	75%	85%
	/eə/	25%	25%	00	25%	25%	20%
Av. Of correct perception 40%	/ɔI/	50%	25%	50%	50%	25%	40%
	/Iə/	50%	25%	25%	25%	50%	35%
Speaker D	/I/	75%	75%	50%	50%	50%	60%
	/ʊ/	50%	75%	50%	50%	75%	60%
	/ʌ/	25%	50%	50%	25%	25%	35%
	/ɔ/	25%	25%	25%	00	25%	20%
	/æ/	100%	100%	100%	100%	100%	100%
	/eə/	50%	25%	25%	50%	50%	40%
Av. Of correct perception 55%	/ɔI/	75%	75%	50%	75%	75%	70%
	/Iə/	50%	50%	50%	75%	50%	55%
Speaker E	/I/	50%	50%	50%	25%	50%	45%
	/ʊ/	50%	50%	25%	50%	50%	45%
	/ʌ/	00	00	00	00	00	00%
	/ɔ/	25%	25%	25%	00	25%	20%
	/æ/	75%	75%	100%	75%	75%	80%
	/eə/	00	25%	00	00	25%	10%
Av. Of correct perception 32%	/ɔI/	25%	25%	25%	50%	25%	30%
	/Iə/	50%	50%	50%	50%	25%	45%

Table 9 shows the average of correct perception for each of the missing vowels and diphthongs and the present /æ/ in Farsi.

Table 9: Average of correct perception for missing vowels/diphthongs and present /æ/ in Farsi

Missing vowels in Farsi	% of correct perception	Missing diphthongs in Farsi	% of correct perception
/I/	61%	/eə/	26%
/ʊ/	50%	/ɔI/	47%
/ʌ/	27%	/Iə/	47%
/ɔ/	17%		
/æ/	92%	Overall Av. Of correct perception of missing sounds 38%	

In the third phase of the study, the five Canadian participants were asked to listen to ten sentences which were read aloud by Iranian ESL learners. Each sentence had a missed word and native participants were supposed to write the words they had heard. It should be noted that these missing words contained the consonant clusters which were identified problematic for Iranian participants to pronounce. The results of the analysis of these ten completed sentences for each of Iranian ESL learners as perceived by the Canadian participants are given in Table 10.

Table 10: Summarized results of the analysis of consonant clusters produced by Iranian ESL learners

Consonant clusters spoken by Iranian ESL learners		Canadian participants					Percentage
		C1	C2	C3	C4	C5	
Speaker A	Travel	✓	✓	✓	trouble	✓	80%
	Clear	✓	✓	✓	✓	✓	100%
	Slept	sleped	✓	leapt	✓	leapt	40%
Av. of correct perception 68%	Green	✓	✓	✓	grown	✓	80%
	Toothbrush	✓	✓	✓	✓	✓	100%
	Broke	✓	bronze	✓	✓	broad	60%
	Street	✓	esteem	✓	treat	treat	40%
	Glass	✓	✓	✓	class	✓	80%
	School	✓	ski	cool	cool	✓	40%
	Trivial	✓	travel	✓	towel	✓	60%
Speaker B	Travel	✓	✓	✓	✓	✓	100%
	Clear	✓	✓	✓	✓	✓	100%
	Slept	eslept	✓	sept	eslept	✓	40%
Av. of correct perception 82%	Green	✓	✓	cream	✓	✓	80%
	Toothbrush	✓	✓	✓	✓	✓	100%
	Broke	✓	pork	✓	✓	✓	80%
	Street	✓	steel	treat	✓	✓	60%
	Glass	✓	✓	✓	✓	✓	100%
Speaker C	School	cool	✓	✓	soul	✓	60%
	Trivial	✓	✓	✓	✓	✓	100%
Av. of correct perception 64%	Travel	✓	✓	✓	✓	trouble	80%
	Clear	✓	✓	key	✓	✓	80%
	Slept	✓	spelt	✓	sleep	select	40%
	Green	✓	✓	keen	✓	✓	80%
	Toothbrush	✓	✓	✓	Two brush	✓	80%
	Broke	✓	✓	✓	✓	rock	80%
	Street	✓	stir	treat	✓	tree	40%
	Glass	✓	✓	✓	lass	✓	80%
	School	✓	cool	cool	eschool	✓	40%
	Trivial	✓	✓	✓	✓	✓	100%
Speaker D	Travel	✓	✓	✓	✓	✓	100%
	Clear	✓	clean	✓	✓	✓	80%
	Slept	✓	leapt	leapt	✓	✓	60%
Av. of correct perception 74%	Green	✓	✓	Gee	✓	grid	60%
	Toothbrush	✓	✓	✓	✓	✓	100%
	Broke	boroke	✓	boroke	✓	✓	60%
	Street	stir	✓	✓	stir	✓	60%
	Glass	✓	✓	✓	lass	✓	80%
	School	✓	✓	cool	eschool	✓	60%
	Trivial	✓	revival	✓	✓	✓	80%
Speaker E	Travel	✓	✓	traveler	✓	traveler	60%
	Clear	✓	✓	clean	clean	✓	60%
	Slept	✓	leapt	leapt	✓	leapt	40%
Av. of correct perception 62%	Green	✓	gireen	✓	✓	✓	80%
	Toothbrush	✓	toothrush	✓	✓	toothrush	60%
	Broke	✓	boroke	✓	✓	boroke	60%
	Street	estireet	estireet	estireet	✓	estireet	20%
	Glass	✓	✓	✓	gas	✓	80%
	School	✓	cool	✓	cool	✓	60%
	Trivial	✓	✓	✓	✓	✓	100%

As it is discernable in Table 10, Canadian participants' perceptions of consonant clusters pronounced by Iranian ESL learners was much better compared with their intelligibility of absent consonants
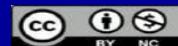
and vowels (the overall average of correct perception was 70%). "Speaker B" was perceived correctly by the Canadian participants 82% of the time while "speaker D" was perceived by the native participants 74% of the time. On the other hand, "speaker E" was only perceived 62% of the time, and had the worst performance.

It is worth mentioning that after analyzing the results drawn from Table 10, it was concluded that "S+ Consonant" construction of clusters caused major problems for all five Iranian ESL learners. The problematic pronunciation of Iranian in words beginning with "S+ Consonant" construction has been documented by some other phonologists (e.g. Hall, 2007). Further to this, an interesting observation was that the rating of the best to worst speaker from the first phase is fully supported by the rating of the percentages of the Iranian participants in this phase.

5. Discussion

Focusing on the results, it was found that Iranian ESL learners were not comfortable in pronouncing some phonological features of English in Farsi such as the absent phonemes and consonant clusters. Moreover, it was revealed that the pronunciations of these features are not totally perceivable by the native speakers. Although Oller and Ziahosseiny (2006) mentioned that early stages of language learning are characterized by a predominance of interference (interlingual transfer), but once learners have begun to acquire parts of new system, more and more intralingual transfer – generalization within the target language – is manifested, there would be some phonologically-based mistakes which are not eradicated by the improvement of the target language. The participants of this enquiry were all advanced learners of English who had the experience of living in the target language's context but suffered from the interference of L1 to L2 phonological systems.

The above analysis clearly revealed that the Iranian EFL learners encountered problems resulting from Farsi's phonology both in pronouncing English words and in being perceived by Canadian English native speakers. This is in line with what Namaziandoost and Bohloulzadeh (2017) found about Iranian learners of Turkish who faced difficulty conversing to native speakers. The study is more or less in line with Mayberry (2007) who argued that if there are similarities in L1 and L2 the

learners have less problems in acquisition of L2 and fewer errors may occur in L2 but if there are no or little similarities of the structure of first language and second language, learner is faced with a lot of problems in L2 acquisition and it is not easy for them to learn.

The results were also in contrast with what Derakhshan and Karimi (2015) and Jabbari and Samavarchi (2011) found in their studies. They proposed that the linguistic transfer from L1 to L2 is essentially positive and affects all aspects of the language even the phonology. They argued that the phonology of the first language not only does make the experience of the language learning easier but also paves the way for the learners to make informed comparisons, and informed comparisons of two or more linguistic systems are the most determining parameter for learning an extra language.

6. Conclusion

The analysis of findings supported the notion that phonological characteristics (segmental features) of Iranian ESL learners interfere with their intelligibility when they interact with Canadian native speakers. In addition, this study highlights the extent to which phonological characteristics of Iranian participants affect their intelligibility during interaction with native English Canadian speakers. The obtained results also confirmed the prediction of CAH that the absent phonemes (/ɔ/, /eə/, /ʌ/, /ɔI/, /Iə/, /ʊ/, /I/, /θ/,/ð/ in the Farsi sound system do cause difficulties for the intelligibility of Iranian learners of English unlike /æ/ and /ʧ/ which exist in both Farsi and English phonological systems. In considering consonant clusters, the analysis of findings showed that due to the differences between the Farsi and English syllabic structures, Iranian ESL learners experienced problems with English consonant clusters to a varying degree. It was also found that "S+ Consonant" clusters which are absent in Farsi caused more problems for Iranian participants than non-"S+ Consonant" clusters.

It should be kept in mind that the main objective of language classes is to make the students capable of communicating in the target language. Without an intelligible pronunciation meaning negotiation becomes impossible. As Celce-Murcia (1995, p. 369) put it, 'in many instances where reduced speech or imperfect acoustic processing might obscure a message'. Since, the teacher should pay particular attention to the

integration of all the skills. For instance, if the students think of "reading" as the only necessary skill for their long term objectives, it should be made clear to them that mispronunciation of a word may occasionally lead them to a wrong semantic interpretation.

It is hoped that the findings of this study can provide ESL/EFL teachers with a set of general ideas about the possible problems that ESL/EFL learners may encounter in pronunciation. By being aware of the likely problems to be incurred by the students' lack of familiarity with certain phonemes, ESL/EFL teachers can accommodate these problems by allowing more time to focus on phonemes that are likely to cause problems. The following section presents some pedagogical implications in this respect.

Pedagogical implications

Such observation of L2 pronunciation errors mentioned would naturally suggest the critical need for ESL/EFL teachers to become more aware of the impact that the learners' L1 sound system and syllable structure will bring to the learning of English pronunciation. To achieve this awareness, Contrastive Analysis can convey insights into the differences and similarities between the L1 and L2 phonological characteristics. In fact, with the application of CAH, ESL/EFL teachers can find out on which particular phonological characteristics of English they should concentrate their efforts.

According to Rosenberg (2005, p. 57) who has stated, 'Becoming bilingual is a special gift parents can offer their children, but the gift must be planned and presented with care for it to be well used and appreciated', English or any other language must be taught at the very early stages. Although there is no such course as English at the primary level, it would be quite useful if school children were motivated to keep contact with the language for at least 90 minutes a week or 15 minutes a day.

In today's world of technological developments, the Computer-Assisted Language Learning (CALL) can be a great help for improving the students' mastery of pronunciation (Hayati, 2005). Hill and Storey (2003, p. 13), for example, have presented an online-based procedure through which students can make themselves familiar with the pronunciation of new vocabularies to be taught before attending the class. They concluded, 'On-line pronunciation practice will bring about native-like pronunciation in the long-run.'

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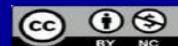
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