Pronunciation Errors of English Front Vowels by Yemeni EFL Learners

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A B S T R A C T

In the domain of English as a foreign language, many learners still face some difficulties in articulating vowel sounds of English, particularly the front ones. This study attempts to describe Yemeni EFL learners' errors while pronouncing the English front vowels. The subject of this study was the eighth-semester students studying at the English department, Faculty of Education, Mahweet branch, Sana'a University. The descriptive qualitative approach was utilized in this study. The data was collected by recording learners' pronunciation of English front vowel minimal pairs. The data was then compared with the ones produced by an English native speaker. The findings were confirmed by the spectrogram technique to identify the formants of F1 and F2 made by the learners in Praat Software Device. English front vowels /i / - / I /- / ɛ / and / ae / were the target sounds. The study's findings revealed that Yemeni EFL learners' pronunciation differs from those produced by native English speakers. It was also revealed that Yemeni EFL learners are still struggling in articulating English front vowel sounds due to the influence of the sound system of their native language that causes such pronunciation problems in the target language.

1. Introduction

In Yemen's language learning process, at the Faculty of Education, Mahweet, Sana'a University, students are required to study English as a primary subject. As a foreign language, English often interferes with Arabic, which is Yemen's native language. Based on researchers' observations on student learning activities in the class and the campus, students often make errors in pronouncing words in English, especially when using words that have a similar pronunciation. This deviation occurs since there is interference from other languages, especially Arabic. This pronunciation error can give a different perception to the English native speaker or against fellow students. According to Hassan (2014), interference occurs because everyone tends to transfer the form, meaning, and distribution of their native language and culture into languages and foreign cultures. The object of this research is the front vowels of the English language spoken by the eighth semester Yemeni EFL learners of Sana'a University. The researcher chose the English front vowels for contrastive analysis with Arabic because, in Arabic, there is no change in sound structure in vowels [i] and [ɛ]. Without changing this sound's construction, Yemeni speakers will experience interference when pronouncing English front vowels, such as beat/bit/ and seat /sit/.

To determine whether or not the English front vowels' pronunciation is wrong, the researcher conducted a contrastive analysis to observe differences and similarities of vowel aspects. According to Tushyeh (1996), the contrastive review attempts to explain internal deviations in foreign languages that have disputes with L1 words. The effort made by researchers is to compare the native language (L1) with the learner language (L2), using Praat software. The Praat is a phonetic program used to analyze

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speech sounds of communication, both accurate and manipulated. This software was developed in 2011 by Paul Boersma and David Weenink from the University of Amsterdam. By using the Praat, the researcher compared the F1 and F2 formants, which relates to the quality of the vowels. F1 is inversely proportional to height vowels. If F1 is high, the vowel that is pronounced is low. Meanwhile, F2 is directly comparable to the front or back of the vowel. More and more, the higher the F2 is, the further the vowel is.

Researchers use a minimum pair in the English language to find out students' errors in pronouncing the English vocabulary. Minimal pairs or minimum pairs are two similar words; however, they have a different sound. Because of the difference, these two words have different meanings. An example in English is beat/heat/, pen/men/. Thus, vowels are chosen as a tool of articulation in minimal pairs because vowels are the giver of the core meaning to a word (Silva, 2012). Besides, The fundamental object in learning language sounds in a minimal pair is the "Phoneme," which is the sound produced by the human speech instrument (Nuraeni, 2015).

In a quick review, vowels are produced with a relatively open vocal tract; no significant constriction of the oral (and pharyngeal) cavities exists. The air stream from the vocal folds to the lips is relatively unimpeded. Therefore, vowels are considered open sounds. Bauman-Wängler (2009) provides information regarding the English vowels that are likely to present the most significant articulation and perception problems by Arabic-speakers. The distinction between specific vowels, mostly open, lax, short vowels such as /ɪ/, /ɜ/, and /ʊ/ will be problematic for the Arabic speakers. According to Power (2003), the /ɪ/ vowel be lengthened and lowered to /e/, whereas /ɜ/ may be produced as /i/ or /æ/.

No doubt, some English vowels are likely to trigger anxiety when Arabic English learners articulate and interpret them, particularly if they are not found in modern Arabic. Kharma & Hajjaj (1989) noted that the vowel phoneme /ɪ/ can also be troublesome - it can be generated as /e/, whereas /ɜ:/ can be expressed as /ɪ/ or /æ/. It also indicated that /ɛ/ and /ɪ/, as in "sit" and "set," can also pose challenges. Another challenge was indicated by Kalaldeh (2016), who studied the problems confronting Jordanian Arab students in pronouncing English in four ways: consonants, consonant clusters, word stress, and vowels. The researcher researched the following in the area of vowels that /ɪ - ɛ - ɑ - ɔ: - oʊ - ə/ confused the participants. For instance, Participants repeatedly confused front vowels in words like "Set, sit."

Several researchers have also examined and elucidated the English pronunciation made by native speakers of different languages worldwide, such as Japanese, French, Portuguese, Thai, etc. However, this study is essential since it aims to be part of a series of studies on pronunciation errors uttered by EFL Arabic-speaking learners like (Taqi et al., 2018; Ali, 2015; Hassan, 2014; Riadi, 2013; al-Dilaimy, 2012; Al-Saqqaf & Vaddapalli, 2012).

Focusing on the above, Arabic is the mother tongue or first language in most Arab countries. However, spoken Yemeni Arabic can be divided into several dialectics. Local language learners influence these Arabic dialects. Students come to English language classes with multiple Arabic pronunciation and accents. With these differences, they are again introduced to a different phoneme that is not similar to their Arabic variant or the local language's phoneme structures. Any pronunciation mastery in a modern way needs commitment and hard work. In fact, the L1 sound system can positively or negatively affect their learning of the foreign language sound system. For EFL learners, pronunciation capacity is essential. Thus, this paper aims to examine the errors uttered by Yemeni EFL learners in producing front vowel sounds /i/ - /ɪ/- / ɛ / and /ae/. Its goal is to provide a favorable atmosphere for fostering pronunciation skills for students. Examples of English front vowel sounds can be seen in figure 1 below.

In English, the vowel /i/ - /ɪ/ are phonemes, so they can differentiate meaning. An example of these two phonemes' use is in the minimal pairs: beat [bit] and a bit [bɪt].
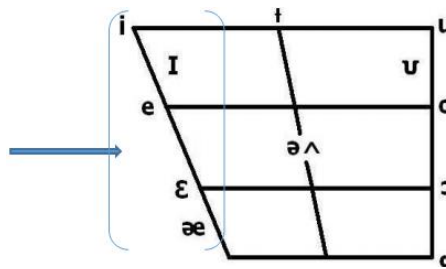
Figure 1. Front English Vowels (Sethi, 1999).

The same is the case with the front vowel phonemes /ɛ/ and /ae/, which are considered one sound in Arabic. Given this difference, English learners in Yemen, whose native language is Arabic language, will have difficulty distinguishing English vowels /i / and /ɪ / and /e/, /ɛ/, and /æ/.

Based on the above background, researchers can formulate problems describing the pronunciation of English front vowels by eighth-semester students at the Faculty of Education, Sana'a University, Yemen. In general, this study aims to describe and analyse English uttered pronunciation errors by eighth semester students of the faculty of education, Sana'a university, Yemen. The results of this study are expected to provide theoretical as well as practical benefits. The expected benefits are learning materials, developing phonological studies in general, and correcting the science of sound interference. Meanwhile, the expected possible benefits are as follow:

a) For students: This research can be used to improve pronunciation in English. Apart from that, this research can also be used as a reference for students.
b) For teachers: The study's results are expected to be used by teachers as one of the phonological learning materials.
c) For researchers, this research is expected to deepen the researcher's insight into phonology, especially vowel phonemes.

The scope and limitations of the problem in this study are pronunciation errors of the English front vowels /i/, /ɪ/, /ɛ/, /æ/ uttered by 8th semester EFL students, department of English, faculty of education, Mahweet, Sana'a university, Yemen, caused by Arabic language interference against English. In the following, some theories used in this study will be presented.

Contrastive Analysis Theory

The contrastive analysis compares two languages to find what aspects of the target language give rise to the error. Contrastive analysis is a method used to look for a difference between the first language (L1) and the target language (L2) that often makes language learners have difficulty understanding a target language material that they learned so that learners can understand a second language or a foreign language more easily. (Tushyeh 1996) & (Bayraktaroğlu, 2008). Contrastive analysis as a study between languages (Interlanguage Study) is characterized as a form of interlingual study or something which Selinker (1972) & Riley (2005) has called "interlinguistic." Interlinguistic always involves more than one language. Here, the contrastive analysis exists to compare two languages of all their components so that some differences and similarities exist. From the findings, it can be assumed that para bilingualism has deviations, violations, or mistakes. Deviations from other language norms are due to the strength of the greater interference in the direction of L1 to L2, which is the concern of contrastive Analysis (Broselow, 1984).

Phonemes

The phoneme is the smallest unit of speech sound in the sound system of a certain language (Sethi, 1999). Wells (1982) also defines a phoneme as minimal language sounds that differentiate the form and meaning of words. While according to Carr (2019), phonemes are the unified smallest sounds of a language that distinguish meaning. Lyon (1981) assumes that the phoneme is a language's smallest functional unit classified into two parts: vowel phonemes and consonant phonemes.

Phonemes are objects of phonological studies that study the sounds of the language that serve to distinguish meaning. Phonemes are the sound parts of a word or the smallest that serve to distinguish

the meaning of other words in a language (Alkhuli, 2000). According to Sethi (1999), the phoneme has no meaning, while those with meaning are words that have phoneme elements. In writing, the phoneme is written as /.../; for example, heat/hit / while language sounds are written in [...], for example, heat [hit]. A phoneme is a description of one or several language sounds, either it is in the form of vowels and consonants. According to Silva (2012), phonemes can be presented through articulation and acoustic descriptions. From an acoustic point of view, it is noted that a vowel is a sound characterized by a frequency formant. According to Ladefoged (2005), we can analyze vowels as long as we measure the two formants' true frequency.

When we meant to describe the vowels' articulation, simply an acoustic description for knowing the value and frequency of the formants, F1, and F2 were adopted. Formant frequency values first (F1) have an inverse relationship with the tongue's vertical position when producing a vowel. The higher the vowel, the narrowing is greater from the overhead line, the lower the F1 frequency. For example, vowel high [i] has an F1 frequency value smaller than the lower vowels [ɛ] and [æ]. The value F2 frequency is related to the horizontal position of the tongue. For example, the front vowel [i] has a frequency of F2 higher than the vowel [ɪ], and [ɛ] has a higher F2 than [æ]. Thus, this acoustic articulation, allows us to identify speech vowel sounds through two-dimensional graphics F1 and F2. In contrast, Yallop & Fletcher (2007) argue that phonemes can be tested and evidenced by the minimal pair. So, word pairs are required to investigate the minimal differences between the sounds of speech contained in different words. For example, there is a minimum pair of heat/hit / and seat/sit/in English. The word pair has two different sounds, namely [p] and [b]. This shows that /p/ and /b/ are two different phonemes and have a different meaning (Sethi, 1999) & (Delahunty & Garvey, 2010).

Minimal Pair and Vowels

The difference in the sounds of the language can be seen through a minimum pair. From the difference in sound in a minimal pair, we can distinguish the words' meaning with almost the same sound. To know the phonemes of a language, all you have to do is take notes and analyze the language's phonemes being the study's target, starting from words with one syllable to more syllables. Minimal pairs have at least one difference in sound, thus causing a different meaning (Avery, 1992). Here are some examples of minimal pairs in English:
Example:
a) The word pairs "heat" and "beat" are distinguished by the phoneme /b/ and /h/ with sounds [b] and [h]

b) The word pairs "sat" and "mat" are distinguished by the phoneme /s/ and /m/ with sounds [s] and [m]

Vowels (in phonetics) is the voice in the spoken language, which is characterized by the vocal cords open so that no air pressure collects above the glottis. Vowels are the essence or top of the syllable in all languages. There are five vowels, namely a, i, u, e, and o. The shape and sound of the phonemes are shaped like a cube.
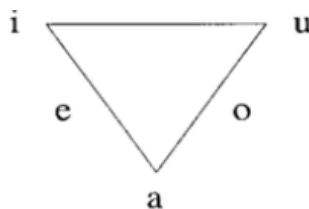

Figure 2. Vowels

In this way, vowels are the sounds of human speech in the production of which the air flows continuously, accompanied by the vibrating vocal cord. In other words, vowels are the sounds of a language where the current air is not running into obstacles. The quality of the vowel formation is determined by three factors, namely the level of the tongue, the part of the tongue that is moved forward and to back, and the shape of the lips. Vowels, in general, can be distinguished by the following classifications:

1) Vowels based on the level of the tongue.
2) Vowel classification based on the height and position of the tongue will result in the following: a) high vowels: /i/ and /u/; b) middle vowels: /e/ and /o/; c) low vowel: /a/
3) Vowels based on the part of the tongue (front, middle, back).
4) Vowel based on the moving part of the tongue, a vowel shape produced is: a) front vowels: /i/ and /e/
5) Back vowels: /u/ and /o/; b) Middle vowel: /a/; c) Vowels based on the shape of the lips.
   Judging from the shape of the lips when producing language sounds, there are two kinds of vowels, namely:
   a) Circular vowels: /u/ and /o/
   b) Unrounded vowels: /i/, /e/ and /a/. (Delahunty & Garvey, 2010) & (Aitchison, 2004)

English and Arabic Vowel Systems

According to Brinton & Brinton (2010), there are 16 American English vowel phonemes consisting of monophthongs and diphthongs. The vowels are described according to articulated characters: high/low, front / back, the position of the lips round / not round. The vowel diagram can be seen in figure 3 below.
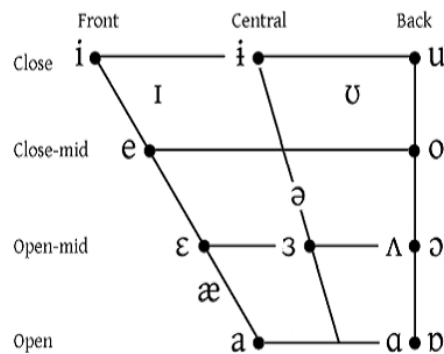

Figure 3. American English Vowel Diagram

The classification of English vowels, according to (Roach 2009), is divided into two types, namely: monophthong (long vowel, short vowel) and diphthong. Here are the characteristics of each type of vowel sound in English:
1) Monophthong:
   Monophthong or pure vowels is a single vowel sound formed with the quality of the speech apparatus (tongue) that does not change from the beginning to the end of the pronunciation in a syllable. Monophthongs are divided into two sound classifications, namely:
   1- "short" vowels: ɪ, i, ɛ (e), ə, a (æ), ʌ, ɒ, ʊ,
   2- Long vowels: i, ɜ, ɑː (aː), o: (ɔ :), u.

2) Diphthongs (diphthongs)
   The usual diphthong is denoted by two vowels, which cannot be separated. In the pronunciation of a diphthong vowel in a syllable, there is a difference in tongue position at the beginning and the end. The difference concerns the height, the low level of the tongue, the part of the tongue that moves, and the distance between the tongue and the palate.

   In English, diphthongs are divided into two types, namely rising diphthongs, for example /eɪ/, /aɪ/, /aʊ/, /ɔɪ/, /əʊ/ and falling diphthongs, for example: /ɪə/, /ʊə/, and /ɛɒ/. Based on the high and low position of the tongue and the rise and fall of the movement of the tongue, English vowels can be classified as follow:
1) High vowels: /i/, /ɨ/ and /u/.
2) Middle vowels: /ɪ/, /e/, /ɛ/, /æ/, /ə/, /ɜ/, /ʊ/, /ʌ/, /o/ and /ɔ/.

3) Low vowels: /a/, /ɑ/ and /ɒ/
4) Front and Back vowels in English
1 Judging from the position of moving the tongue in producing English vowels, the resulting vowel sounds are as follow:
   a) Vowels: /i/, /ɪ/, /e/, /ɛ/, /aɐ/ and /a/.
   b) Back vowels: /u/, /ʊ/, /o/, /ɔ/ and /ɒ/.
   c) Middle vowels: /ɨ/, /ə/, /ɐ/, /ʌ/ and /ɑ/.

The English vowel is seen from the position of the lips, rounded and not rounded. Types of vowels based on the shape of the lips in English are divided into two types, namely round vowels and unrounded vowels. The round vowel is pronounced when the lips are rounded, and the unrounded vowels are pronounced when the lips are unrounded. These vowels can be illustrated in the following:
 a) Rounded lips: /u/, /ʊ/, /o/, /ɔ/ and /ʉ/.
 b) Unrounded lips: /i/, /ɪ/, /e/, /ɛ/, /æ/, /a/, /ɨ/, /ə/, /ʌ/, /ɑ / and /ɒ /. / (Lyons, 1981), (Alkhuli, 2000) & (Aitchison, 2004).
Both English and Arabic sound systems have pure vowels. /i, a, u/ are the common vowels in English and Arabic languages. /e, i, ə, æ/ are restricted vowels to English and not found in the Arabic sound system, whereas /a:/ is just an Arabic restricted sound and not found in English (Alkhuli, 2000) & (Aitchison, 2004).

Sound Interference between Languages

Understanding language sound interference occurs when two people speaking a different language meet in a language contact in a sufficient time so that their languages influence each other (Dwinastiti (2017), The interference is an event of deviation of language norms from one or more languages. Interference is also an error made because of the influence of habits in pronouncing the first language's sounds into a second language or dialect. In terms of language purity, interference at the level of phonology, morphology, and syntax is a disease that destroys language, so it should be avoided. Interference is a change in the system of a language due to the influence of other language elements by bilingual speakers (De Saussure, 2011).

Another understanding put forward by Lekova (2010) states that interference is a symptom of the infiltration of a language system into another language. Interference arises because speakers apply the system of sound units (phonemes) from the first language to the second language, resulting in a deviation in the receiving language's phonemic system.

 Based on some of the opinions above, it can be said that interference is a symptom that occurs in a bilingual and multilingual society due to language contact, which results in language deviations, language rules, absorption, and use of foreign language vocabulary.

Language interference, according to Lekova (2010), can be classified as follows:
1) Sound interference (phonic interference)
   This interference occurs when the speaker identifies the phoneme system of the first language (the source language or language that is very strong in influencing speakers), then use it in a second language system (target language). In pronouncing the sound in a second language, the speakers conform to the first language phonetics rules.
2) Grammatical interference
   Another type of interference is structural interference; that is, the use of the first language's structure in the second language. For example, sentences in the English language, "my friend and I told that story to my father," because of the translation from "My friend and I told the story to my father." In sentences, English seems to be like the use of the Arabic language structure. A good translation is "my friend, and I tell that story to my father."
3) Vocabulary interference (lexical interference)
   This interference occurs because of the transfer of morphemes or words from the first language to the second language. This can also occur due to the expansion of using words in the first language that are interpreted as the second language that is resulting in the creation of new words that are not used properly.

4) Interference of the meaning (semantic interference)
Interference in meaning/semantics can be divided into three parts, namely:
   a) Interference is an expansion of meaning or expansive interference. For example, the concept of the word 'distance", which comes from Portuguese into the vocabulary of the language English, or the word *democracia* becomes democratic.
   b) Additional sense or additive interference, i.e., the incorporation of modern vocabulary with unique definitions. There is also interference in the attempt to smooth the meaning; for example, in English, the terms from vagrants to homeless people and criminals to convicts are refined.
   c) Reputation interference occurs because of the replacement of vocabulary caused by changes in meaning, such as the words "I," which comes from the Malay language "*sahaya*."

   The factors that cause interference, according to Lekova (2010), include:
1) The speech participants are bilingual
2) Lack of user's loyalty to the language received
3) Lack of vocabulary in accepted languages
4) The loss of rarely used words
5) The need for synonyms
6) Prestige towards L1 language and language style
7) Familiarity with L1

   Taqi et al. (2018) conducted a study to investigate the diverse realization of English vowel sounds. The participants were 55 learners of English from Kuwait. Mixed methods were used, and interviews were employed too. Based on this study's findings, it was revealed that Kuwaiti learners encountered difficulties in pronouncing all English vowel sounds, especially those vowel sounds that do not occur in their first language.
   To find out the most common difficulties experienced by English language students studying at the university of Albaha, Saudi Arabia. Ali (2015) also conducted his study to give new knowledge regarding the problems in English vowel sounds in monosyllabic, disyllabic, and multi-syllabic words faced by Saudi learners of English. Pre and post-tests were adopted for the sake of comparison. The study's findings showed that Saudi learners of English encountered difficulties in pronouncing English vowel sounds with the highest percentage in multisyllabic words. The study finally suggested some strategies like the listening practice that should be employed during English study so that students could be aware of the proper pronunciation of English.
   Sembiring & Ginting (2016) further attempted to investigate English pronunciation errors done by students of the English department in the program of Education study at UNIKA. The participants were in their 4th semester of study and pronounced words with Consonant, vowel, and diphthong sounds. The result was calculated by using the percentage. The study's findings revealed that 32% of errors were committed while pronouncing consonants, 31% for vowels, and 32% for diphthongs. All of these are attributed to the lack of students' exposure to English sounds and poor practice in English pronunciation.
   Mirzaei et al. (2015) also conducted their study to find out how English vowel sounds were acquired by EFL learners. This was done by comparing Kurdish and Persian vowel sounds with the English ones. For such purpose, the contrastive analysis hypothesis was conducted. 120 participants were in their elementary, and advanced stages in their study were involved in the study. They were asked to find out the predictable differences existing in the phonological performances between Kurdish and Persian EFL learners. The study results revealed that several important differences were shown at the elementary stage between the two sets of participants.
   Furthermore, Hassan (2014) conducted his study to discuss the problems that Sudanese students faced in pronouncing English sounds as well as the factors behind these difficulties. The participants were 50 Sudanese students studying at the University of Science and technology. 30 teachers of the same university were involved too. The data was collected by observing, recording students' pronunciation, and distributing a prepared questionnaire. Having collected the data, the researcher classified and analyzed them based on statistical and descriptive approaches. The results of the study showed that Sudanese students usually face difficulties in pronouncing English sounds. Besides, they

encountered difficulties in pronouncing certain English consonants. They found difficulties in pronouncing both English short and long vowel ones too. Some factors that cause such difficulties were mentioned too.

The study by Riadi (2013) also attempted to investigate students' performance in short and long English vowel sounds. 30 participants in their second semester of the study were involved in this descriptive study. Minimal pair tests, including 15 sentences with 900 transcriptions of sounds, were adopted. This study's findings showed that a great number of students have difficulties in pronouncing both short and long vowel sounds of English.

Moreover, In the study conducted by al-Dilaimy (2012), Omani students of English were the subject of this study. The object was the English pronunciation problems regarding the consonant, vowels, and diphthong sounds of English and the factors that led to such pronunciation problems. The findings showed that Omani students whose first language is Arabic might face difficulties while pronouncing English sounds. In the vowel pronunciation area, Omani students' pronunciation was affected by the first language interference that results in difficulties regarding producing, identifying, and receiving English vowel sounds. The study finally recommended some strategies that help Omani students of English to overcome their pronunciation problems while using English.

In the field of teaching pronunciation of the English language, Al-Saqqaf & Vaddapalli (2012) also conducted their study to tackle the pronunciation problems regarding teaching English pronunciation. The subject of this study was eight speakers from different Arab countries in the Gulf. The findings of the study proved that Arab learners of English do not master English vowels well. As a result, the study recommended that perfect models of teaching English vowels for those whose first language is Arabic must be adopted. Then Arab students compelled themselves to contrast the vowel sounds existing in their native language (Arabic) and the English language. After collecting and analyzing the data, the researchers proposed some suitable models for teaching English vowels.

Vowels can be defined as speech sounds that, in their production, there is no obstruction in the oral passage that would cause audible frictions. In this case, a vowel sound is an open sound. They are considered one of the significant problems experienced by an Arabic speaker. This is indicated by Bauman-Wängler (2009), who stated that Arabic speakers encounter some problems in English vowel sound articulation and perception, particularly those which are so near to Arabic ones like [ʌ], [e], and [ɔ]. Barros (2003) indicated that the realization of the vowels, which are central, varies. Such a sequence with and without /r/ coloring do not occur in the Arabic sound system, so the variation of /u/-/æ/or /a/ is put in the place of /ʌ/ in such a case, the Arabic r-sound in that sequence will be affected in its quality. English Vowel variations particularly, short open vowel sounds like /ʊ/, /ɜ/, and /ɪ/, also represent a major problem encountered by the Arabic speaker. The vowel sound /ɪ/ can be lowered and lengthened to /e/, whereas /ɜ/ may be pronounced like /æ/or /i/ (Power, 2003). According to Kharma & Hajjaj (1989), one of the major types of difficulty may be encountered by Arabic speakers are the variances between specific vowel pairs such as /e/and /ɪ/ as in 'set' and 'sit' and; /ɒ/and /ʌ/ in 'lock' and 'luck' and /ɔ:/ in 'caught' and 'coat'.

2. Methods

Research Design

This study uses a descriptive qualitative approach because the data obtained is descriptive data that do not use quantity or total percentage. In connection with this research problem, the researchers have a research work plan by collecting data in the form of recorded English pronunciation and front vowels by students studying in semester eight and one native American English native speaker of English. This research was conducted at the English language department, faculty of education, Sana'a university, Yemen. The sound recording was selected clearest and loudest by selecting recordings, which the Praat program reads clearly. All student participants were born and raised in Yemen. The source of American native speaker participants is an American teacher met by the researcher in Surabaya city, Indonesia. He was born and raised in America.

Methods of Collecting Data

To collect the data, the researchers follow these steps:
1) Preparing a list of words
2) Making a list of minimal pairs
3) Recording the pronunciation of English front vowels
4) Transcribing the recordings
5) Comparing transcriptions
6) Verifying data

Data Analysis Method

The method and technique used to analyze the data in this study were conducted by comparing the formants (F1 and F2) of the participants' English pronunciation with Native Speakers' English pronunciation. For example: /i/ → /ɪ/.

Research Material: Minimal Pair List

The following is an example of a list of minimal pairs used in Praat recording in this research:

Table 2.1 Glossary of English Vowel Sounds /i/, /ɪ/, /e/, /ɛ/ and /æ/

	Vowel Sound	Sound of the Word
1.	/i/ - /ɪ/	Beach [bitʃ] - bitch [bɪtʃ]
		reach [ritʃ] - rich [rɪtʃ]
		bean [bin] – bin [bɪn]
		seat [sit] - sit [pɪt]
2.	/ɛ/ - /æ/	pen [pɛn] - pan [pæn]
		bet [bɛt] – bat [bæt]
		men [mɛn] - man mæn]
		beg [bɛg] - bag [bæg]

3. Results and Discussion

Analysis of Native and Non-English Participant Formants

This study aims to present the results of the analysis that has been done. In this section, the research results will be described in detail related to the basic theory in the review of related literature. Analysis standards are set based on the assumption that the participants are native English having a more accurate vowel quality than non-native English. From the analysis that has been done, it is found that the average value of frequency F1 and F2, for vowels /i/, /ɪ/ and /ɛ/, /æ/ produced by native and non-native can be grouped as follows:

Table 3.1 Native English Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	389	2750
	Bitch [bɪʧ]	498	2156
	Reach [riʧ]	380	2619
	Rich [rɪʧ]	501	2154
	Bean [bin]	388	2609
	Bin [bɪn]	515	2173
	Seat [sit]	395	2481
	Sit [sɪt]	512	2010
/ɛ/ - /æ/	Pen [pɛn]	638	1897
	Pan [pæn]	800	1749
	Bet [bɛt]	635	1854
	Bat [bæt]	819	1669
	Men [mɛn]	656	1767
	Man [mæn]	767	1533
	Beg [bɛg]	597	1701
	Bag [bæg]	732	1579

The results obtained from the native English participant formant analysis shows the quality of the vowels produced by native English with frequency F. 1 and F. 2 in vowels/i/ and /ɪ/ in the minimum English pair produce different F1 and F2 frequencies. Likewise, F. 1 and F. 2 of the vowels /ɛ/ and /æ/ produced by native English indicate quite a difference with the frequencies. Therefore, it can be concluded that native English pronounce the vowels /i/, /ɪ/ and /ɛ/, /æ/ accurately according to the difference, the height and position of the vowels.

Table 3.2 1st Participant Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	417	2698
	Bitch [bIʧ]	414	2575
	Reach [riʧ]	446	2567
	Rich [rɪʧ]	444	2565
	Bean [bin]	444	2769
	Bin [bɪn]	442	2659
	Seat [sit]	436	2555
	Sit [sɪt]	434	2535
/ɛ/ - /æ/	Pen [pɛn]	633	2012
	Pan [pæn]	620	2000
	Bet [bɛt]	619	2000
	Bat [bæt]	609	1997
	Men [mɛn]	615	1988
	Man [mæn]	610	1987
	Beg [bɛg]	609	1996
	Bag [bæg]	602	1995

The F1 and F2 frequencies in table 3 show that there is almost no difference in the quality of vowels produced by participant 1. There is no significant difference in the minimum pair due to the fact that the difference between F1 and F2 is very little. Therefore, it can be concluded that participant 1 cannot distinguish between the vowels /i/, /ɪ/ and /ɛ/, /æ/, so he uttered vowels relatively the same for both.

Table 3.3. Participant 2 Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	442	2781
	Bitch [bɪʧ]	389	2753
	Reach [riʧ]	482	2537
	Rich [rɪʧ]	408	2226
	Bean [bin]	460	2728
	Bin [bɪn]	411	2699
	Seat [sit]	498	2578
	Sit [sɪt]	449	2393
/ɛ/ - /æ/	Pen [pɛn]	626	1980
	Pan [pæn]	620	1972
	Bet [bɛt]	653	2001
	Bat [bæt]	662	1998
	Men [mɛn]	608	1907
	Man [mæn]	603	1900
	Beg [bɛg]	595	2000
	Bag [bæg]	586	1990

Vowel quality /i/, /ɪ/ and /ɛ/ - /æ/ produced by student 2 in table 4, does not have a significant difference because the F1 and F2 scores are not much different. Thus, it can be concluded that student two cannot distinguish the pronunciation of /i/ - /ɪ/ and /ɛ/ - /æ/ in English minimum pairs, resulting in quality vowels, which is almost the same for the two vowel pairs.

Table 3.4. Participant 3 Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	361	2353
	Bitch [bɪʧ]	359	2331
	Reach [riʧ]	387	2775
	Rich [rɪʧ]	367	2766
	Bean [bin]	334	2549
	Bin [bɪn]	318	2514
	Seat [sit]	361	2557
	Sit [sIt]	360	2528
/ɛ/ - /æ/	Pen [pɛn]	619	1987
	Pan [pæn]	605	1984
	Bet [bɛt]	605	1998
	Bat [bæt]	600	1992
	Men [mɛn]	596	1918
	Man [mæn]	592	1909
	Beg [bɛg]	613	1919
	Bag [bæg]	606	1914

Vowels /i/, /ɪ/, and /ɛ/, /æ/ in the minimum English pairs produced by student 3, in table 5, do not significantly differ because the F1 and F2 score almost the same. From the data obtained, it can be concluded that student three cannot pronounce the vowels /i/, /ɪ/ and /ɛ/, /æ/ according to Standard English because the quality of the resulting vowels does not differ much.

Table 3.5 Participant 4 Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	297	2238
	Bitch [bɪʧ]	288	2092
	Reach [riʧ]	336	2248
	Rich [rɪʧ]	312	2234
	Bean [bin]	300	2186
	Bin [bɪn]	299	2182
	Seat [sit]	358	2200
	Sit [sɪt]	343	2160
/ɛ/ - /æ/	Pen [pɛn]	698	1594
	Pan [pæn]	682	1589
	Bet [bɛt]	620	1983
	Bat [bæt]	716	1851
	Men [mɛn]	609	1947
	Man [mæn]	605	1939
	Beg [bɛg]	618	1955
	Bag [bæg]	612	1953

The frequency of F1 and F2 in the minimum English pairs in table 6 is almost the same. Thus, the researchers concluded that student 4 could not distinguish vowels /i/ - /ɪ/ and /ɛ/ - /æ/ well, thus he pronounced the sounds with almost the same quality.

Table 3.6. Participant 5 Vowel Sounds /i/, /ɪ/ and /ɛ/, /æ/

Vowel Sound	Sound of the Word	F. 1	F. 2
/i/ - /ɪ/	Beach [biʧ]	380	2336
	Bitch [bɪʧ]	376	2309
	Reach [riʧ]	446	2661
	Rich [rɪʧ]	444	2528
	Bean [bin]	388	2068
	Bin [bɪn]	379	2060
	Seat [sit]	312	2013
	Sit [sɪt]	300	2010
/ɛ/ - /æ/	Pen [pɛn]	537	1947
	Pan [pæn]	535	1917
	Bet [bɛt]	520	1734
	Bat [bæt]	520	1734
	Men [mɛn]	539	1792
	Man [mæn]	507	1787
	Beg [bɛg]	522	1738
	Bag [bæg]	514	1710

For the words in the minimum English pairs in table 7, student 5 produced almost the same vowel quality. Vowel quality /i/ and /ɪ/ have the frequencies of F1 and F2 that are almost the same. Likewise, with the F1 and F2 frequencies, the vowels /ɛ/ - /æ/ in the minimum English pairs have the same vowel quality. Thus, it can be concluded that student five cannot distinguish the vowel sounds /i/ - /ɪ/ and /ɛ/ - /æ/, because there are no significant differences between the pronunciations of the minimal pairs tested. In fact, In English, vowels /i/ - /ɪ/ are phonemes, so they may distinguish meaning and disturb Yemeni Arabic-speaking learners' pronunciation. An illustration of utilizing these two phonemes is minimal pairs: beat [bit] and a bit [bɪt]. The same refers to front vowel phonemes /ɛ/ and /ae/, which are called

one sound in Arabic. Given this difference, English learners in Yemen whose native language is Arabic would have difficulties in separating English vowels /i/ and /ɪ/ and /e/, /ɛ/and /æ/.

In this way, (Alkhuli, 2000 & Aitchison 2004) indicated that both English and Arabic sound systems have pure vowels. /i, a, u/ are the common vowels in English and Arabic languages. Sound /e, i/ are restricted vowels to English and not found in Arabic sound systems, whereas /a:/ is just an Arabic restricted sound and not found in English. The absence of these elements from the EFL learners' native language forms a difficulty before them while learning the target language. In this case, they commit errors in pronouncing them and resort to substitute them with the similar or the nearest sound in their mother tongue. Similar conditions prevailed with the Yemeni EFL learners while pronouncing the vowel sounds, which are restricted to the target language (English) /e, i/, and not found in their mother tongue (Arabic).

Discussion

The study results showed low performance in pronouncing English front vowels among EFL learners at the faculty of education, Maweet, Sana'a university, Yemen. In fact, most English language classes in Yemen focus on reading and writing skills at the general or higher education level. Several grammar and vocabulary learning exercises of English as a foreign language have been included in Yemen. Written compositions are given a different class and a separate test in general education institutions. It is not different at the undergraduate level since many classes need students to develop their writing skills. Courses such as paragraph writing, intermediate writing, writing structure, reading comprehension, and advanced grammar are personalized to students at various stages—too few classes for listening and communicating, though. Students are not subjected to audio-visual artifacts, tapes, or initial captured content containing the speech and pronunciation of native speakers. Therefore, pronunciation and speech practices are almost ignored in Yemeni foreign language schools. Therefore, several Yemeni students who graduated in English seemed unwilling to interact orally while they could do so in writing.

Another important aspect that could have affected the students' poor performance is native language interference (Ellis, 2005 & Alshayban, 2012). Many, if not all, EFL learners in Yemen are speaking Yemeni Arabic. Interestingly, Arabic is a phonetic language, while English is not a phonetic language in the sense that the symbol does not reflect a phoneme. Many linguists believe that identical language properties are easier to be understood than differences. And they assume that learners can transfer first language features when studying the second language (Riley, 2005). Thus, EFL learners in Yemen can transmit the Arabic phonetic system while pronouncing the front vowel sounds in English.

L1, however, has a significant influence on learning a foreign language, mispronunciation often occurs for other reasons. For example, learning English may be troublesome because each vowel has many pronunciation forms (Cruttenden, 2014). Some words are pronounced differently, but they sound the same (for example, hair and hare). If a learner cannot pronounce each term fluently by looking at its pronunciation, he or she will surely mispronounce it (O'Connor, 1980). Some other studies conducted by Arab researchers have shown that students whose first language is Arabic can have difficulty pronouncing English sounds. In vowel pronunciation, the Arabic-speaking students' pronunciation was affected by their first language interference, which led to difficulties in producing, recognizing, and receiving English vowel sounds (al-Dilaimy, 2012; Hassan, 2014).

In this regard, this study intended to present its findings in depth pertaining to review of related literature's basic theory, choosing vowels as an articulation tool in minimal pairs, since vowels offer a term the core sense (Silva, 2012). Research expectations are set under the basis that native English participants have correct vowel performance than non-native English, which proves that the diverse realization and difficulties in pronouncing English vowel sounds occur if they are uttered by non-native English speakers. Numerous related studies have been done to prove that EFL Arabic-speaking learners face pronunciation difficulties and commit errors while pronouncing English vowel sounds. Taqi et al. (2018) conducted a study to examine diverse English vowel sounds. The Participants were 55 Kuwaiti English learners. Mixed approaches are used, including interviews. Based on these research results, it was revealed that Kuwaiti learners experienced difficulties in pronouncing all English vowel

sounds, particularly those vowel sounds not occurring in their first language. Riadi' study (2013) also sought to examine student success in short and long English vowel sounds. This descriptive research included 30 participants in their second semester. Minimal pair studies, including 15 sentences with 900 sound transcriptions, were implemented. Findings from this research found that several students had trouble pronouncing English short and long vowel sounds. In order to find out the most common difficulties encountered by English language students studying at the University of Albaha, Saudi Arabia. Ali (2015) also conducted his research to provide new information about the problems in monosyllabic, disyllabic, and multi-syllabic vowel sounds faced by Saudi English learners. The analysis found that English Saudi learners had difficulty pronouncing English vowel sounds.

According to the findings of the current study, the first language has a major impact on the participants' mispronunciation. In English, vowels /i/ - /ɪ/ are phonemes, so they may distinguish meaning and disturb the pronunciation of Yemeni Arabic-speaking learners. An illustration of utilizing these two phonemes is minimal pairs: beat [bit] and a bit [bɪt]. The same refers to front vowel phonemes /ɛ/ and /ae/, which are called one sound in Arabic. Given this difference, English learners in Yemen whose native language is Arabic would have difficulties in separating English vowels /i/ and /ɪ/ and /e/, /ɛ/and /æ/. Hassan (2014) conducted his study to address the challenges faced by EFL Sudanese students in pronouncing English sounds and the reasons behind these difficulties. Study findings revealed that Sudanese students generally have trouble pronouncing English sounds. They also faced problems in pronouncing some English consonants and both short and long vowels. Some variables, such as first-language interference, that trigger such difficulties were also noticed. Furthermore, Al-Saqqaf & Vaddapalli (2012) conducted their study to resolve pronunciation problems in teaching English pronunciation. This research centred on eight speakers from various Gulf Arab countries. Study results proved that Arab learners of English do not master English vowels well.

This study's data show that participants cannot distinguish between vowel sounds /i/ - /ɪ/ and /ɛ/ - /æ/, because there are no statistically significant differences between the vowel sounds of the lower pairs tested. In addition, so roughly, they also pronounce the sounds. In other words, Yemeni Arabic-speaking learners cannot pronounce the front vowels /i/, /ɪ/ and /ɛ/, /æ/ according to standard English because the quality of the resulting vowels does not differ much, but is nearly the same for vowel pairs. A vowel sound here is an open sound. They are called one of an Arabic speaker's big issues. This is reported by Bauman-Wängler (2009), who stated that Arabic speakers experience some problems in English vowel sound articulation and perception, particularly those so similar to Arabic such as [e], [e], and [ɔ]. According to Kharma & Hajjaj (1989), one of the main types of difficulties Arabic speakers may experience is the differences between particular vowel pairs such as /e/ and /ɪ/ as in 'set' and 'sit' and; /ɒ/ and /ʌ/ in 'lock' and 'luck' and /ɔ:/ in 'caught' and 'coat.'

In addition to the above, both English and Arabic sound systems have pure vowels. Sounds /i, a, u/ are the common vowels in English and Arabic languages. Sound /e, i/ are restricted vowels to English and not found in Arabic sound systems, whereas /a:/ is just an Arabic restricted sound and not found in English. The absence of these elements from the EFL learners' native language forms a difficulty before them while learning the target language. In this case, they make errors in their pronunciation and resort to replacing it with the similar or closest sound in their mother tongue. Similar conditions prevailed with learners of English as a foreign language in Yemen while pronouncing sounds, which are limited to the target language (English) /e, i/, and not found in their native language (Arabic). (Alkhuli, 2000& Aitchison, 2004).

4. Conclusion

Having analysed the data of the six participants, the researcher found that there are very basic differences and similarities between the native English participants and non-native English participants (Yemeni EFL learners) in pronouncing the English front vowels, /i /, /ɪ/, and /ɛ/, /æ/. With this research, the researcher can find out errors in the pronunciation of vowels, in particular the English front vowels, which are done by 8th-semester students studying at the English Department, Faculty of Education, Mahweet branch, Sana'a University, Yemen. In this study, the researchers found that the English front vowel sounds are different from Arabic, because in English there are front vowels /i/, /ɪ/ and /ɛ/, /æ/ whereas in Arabic there are no vowels like /i/, /e/, /ɛ/, /æ/. In such a case, Yemeni EFL-speaking Arabic learners resorted to substituting these sounds with the nearer sounds existing in their own native

language, and that causes their mispronunciation. To find out the pronunciation errors of English front vowels, researchers used Praat to analyse the resulting F1 and F2 formants by each participant. With the finding of the values of F1 and F2 in the table of analysis above, the researcher can conclude that the vowel quality produced by the non-native English participants (Yemeni EFL learners) is pronounced in a different way from the standard American English because of the influence of the first language sound system that causes such pronunciation problems in the target language.

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