Original Research

Vowel Length Variation in the Pronunciation of Iraqi EFL Learners

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Article Info	Abstract
	This study examined the realization of English vowel length by EFL Iraqi learners. The study was basically interested in identifying whether Iraqi EFL learners are able to realize variations in vowel length based on following sounds. To this end, 20 male and female participants with 20-37 years age range participated in a production test. Before, they did so, they were asked to respond to a demographic questionnaire that aimed to ensure that all informants selected are suitable for the study aims and they well represent the population of the study. The production test included 60 English real words that provided English pure vowels (monophthongs) in different settings. The production was done using high quality smart phones. The recordings were analyzed using PRAAT to measure vowel length. The results showed that though variations in vowel length do exist where these vowels are located in different settings, paired samples T.Tests revealed that these variations were not statistically significant. Moreover, numerical differences in vowel length based on gender variable were present in all vowels; however, results of independent samples T.Tests indicated significant differences in closed settings only. No significant differences among vowel length means in the open setting were identified. EFL learners need to be exposed to native speech and pay attention to phonetic details so as to improve their pronunciation in general and vowel length realization in particular.

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1. Introduction

Acquiring the phonetic system of an FL is always described a tough task to accomplish. This task becomes more complicated when the acquisition process starts at a later stage of a learner's life (Al Abdely & Thai, 2016). Thus, learners as well as teachers are experiencing considerable difficulties in their quest to learn/ teach English in a foreign setting. These difficulties have been always the focus of so many studies, which examined these difficulties with reference to several variables such as L1 transfer, Age of learning, gender, proficiency level, etc. The current study is an endeavour to examine difficulties encountered by Iraqi EFL learners in terms of vowel length variations resulting from variations in the phonetic context these vowels are found in.

Iraqi Arabic (IA) also known as "Mesopotamian Arabic", is an Arabic variant that belongs to the Afro-Asiatic subgroup. The language spoken in Iraq, according to Al-Ani (1970), compromises two varieties "Gelet Arabic" and the "Qeltu Arabic". These two varieties are primarily distinguished by the retention of (qaaf) letter or changing it into /g/ sound. However, some scholars such as Abu-Haidar (1989) and ller-Kessler (2003) believe that there are three Iraqi sub-dialects; Baghdadi, Southern, and Maslawi. Salman (2021, p. 5177) claims that "all spoken Arabic varieties are linguistically related to Standard Arabic (SA)". However, their linguistic systems allow for variations among these Arabic varieties. In comparison to Modern Standard Arabic (MSA), the contemporary form of Standard Arabic, IA "has a richer vowel system" (Al Abdely, 2016, p. 113). IA

vowel system includes nine vowels, while MSA has six vowels only. Alkalesi (2007) clarifies that MSA includes three long vowels only (aa, oo, uu), whereas IA includes five long vowels (aa, ee, ii, oo, uu), in addition to four short ones (a, i, o, u). Al- Bazi (2006, p. 34) assumes that "There are two additional vowels in the Iraqi dialects compared with those of classical Arabic. They are longer than the classic sounds, though they have the same written form". Moreover, IA's consonantal system includes more consonants than (MSA). IA, as stated by Al- Bazi (2006), has three additional consonants and three additional vowels compared to MSA.

According to Cahyaningrum (2022, p. 1) "English is being learned for several purposes by people globally embody some different accents". Lestari and Syarif (2019, p. 81) state that "Communication in foreign language is a bridge to get information, knowledge and   culture, and …. English is international language. So, it is important to master English language". Nevertheless, far-reaching literature proposes that "native Arabic speakers exhibit unique difficulty when reading in English" (Alhazmi et al., 2019). The complications learners stumble upon in acquiring L2/FL sounds are obviously validated in their foreign accented pronunciation. Al Abdely (2016) reports that EFL learners from different linguistic backgrounds show foreign accent in the pronunciation of vowels as revealed in "Mandarin (Rogers & Dalby, 2005), Korean and Spanish (Flege et al., 1997), German (Bohn & Flege, 1992), and Arabic (Nikolova, 2010; Almbark, 2012)". One of the basic reasons for having problems in pronouncing English vowels is, according to Alhabshan, and Alsager (2022, p. 148) ascribed to the fact that "vowels vary from language to language according to their qualities and duration". Thus, acquiring English vowels might be difficult because each one of these vowels can be actually realized in various ways (Cruttenden, 2014). What made things worse is the fact that spelling in English is inconsistent with pronunciation, which is a feature not shared by other languages in general and Arabic language in particular. If the learner is not able to fluently pronounce each word by looking at their spelling, then s/he would most likely mispronounce them (O'Connor, 2016).

Moreover, several factors can add to this variation and make learning English vowels and producing them in an English like or intelligible way a difficult task for foreign leaners to accomplish. Being fluent in English is more than necessary for getting a decent job and building a good personality and prestige. Hence, attaining correct pronunciation of vowels is a vital step in achieving language fluency. Investigations interested in L2 acquisition propose that errors committed by EFL learners in pronunciation are systematic and they often show specific patterns that refer to the linguistic behaviour of learners. L2 sounds may not be pronounced in a nativelike or at least intelligible way simply due to L1 transfer. A particular sound is difficult to pronounce because it is not found in the L1 sound system of the speaker (Homidan, 1984). Several scholars such as Al Abdely (2021), O'Connor (2016), Major (2008), Carter and Nunan (2001) reported that EFL learners tend to substitute English sounds which are absent in their system with the nearest ones available in their system. Sometimes, errors in pronunciation are not replacement errors, they are rather related to the actual pronunciation of the sound. Duration, which is a phonetic feature very much related to vowels, can be a source of problems in the pronunciation of L2 vowels. Vowel length is an important prosodic feature in English and Arabic as well. English vowel length varies based on context and this variation can be phonemic and non-phonemic. EFL learners of English, including Arab learners, might be aware or unaware of this variation. Thus, this work examines Iraqi speakers' ability to realize the correct duration of English vowels in different contexts.

Given the importance of the English language as a highly prestigious and active language, Iraqi education policy lays great attention to the teaching and learning of English at all Iraqi schools and many universities. English has been always an important subject taught at Iraqi schools. It was assigned to students at the age of 9 starting from 5th grade. As stated by Saeed (2015, p. 2) "Recently and after the conflict of 2003 that Iraq endured, teaching English became obligatory from the first year of schooling". Nevertheless, the outcomes of such policy are not up to the ambition level. Iraqi EFL learners still show accented pronunciation. Nativelike English pronunciation was thought to be a requirement to communicate successfully i.e., English used to be seen as a lingua franca where any deviation from the native linguistic behavior is classified as an error. English should rather be seen as a foreign language (Jenkins, 2006). Recently, assuming that natives are the models to be typically imitated by FL has become questionable, and the idea of "World Englishes" has come to the fore (Mahboob, 2010). Based on the statement that communication goes further than nativelike pronunciation, neither Iraqi educational institutions nor the researcher in this study adopt the viewpoint that nativelike pronunciation is a prerequisite for successful communication. However, intelligible English pronunciation should be the goal for Iraqi EFL learners.

Consequently, nativelike pronunciation must not be a premonition for EFL learners as all foreign accents are tolerable but surely they are not all similarly intelligible. This has been supported by Jenkins (2000, 2002), who states that a reasonable intelligibility level of English pronunciation should be achieved to warrant common comprehension among conversers. At the same time, speaking English with a low level of precision might lead to very low intelligibility and clarity and impede successful interaction. Vowel length variation, among several others, is possibly an area EFL learners still lag behind in different non-native learning settings including Iraq. In spite of the statement that vowel length is deemed a well-known aspect in the pronunciation of Arabic vowels, it seems that this has not been reflected in the pronunciation of these vowels by Iraqis. Moreover, a few examinations were done to explore vowel length variations in the pronunciation of Iraqi EFL learners of English. Hence, the present study endeavours to bridge this gap in the literature.

The study intends to examine the realization of eleven English pure vowels by Iraqi EFL speakers to identify whether these learners are aware of the changes in vowel length that happen due to the effect of following sounds. These vowels include short and long RPE vowels stated by Roach (2009, pp. 15-16). The study excludes the schwa /ə/, which is the weakest vowel in English that is seen by several scholars as the weak vowel of all other full vowels (allophone), and thus, not a distinct vowel by itself. The importance of this research could lie in the fact that it is, to the best knowledge of the researcher, among a very few studies that focus on the issue of length variation in the pronunciation of Iraqi EFL learners. One of the most important study limitations is related to the selection mechanism adopted to recruit the sample for this study. Participants selected here were all Iraqis speaking Arabic language as their mother tongue, and have no intensive or extensive exposure to English in an English speaking setting. The stimuli selected for the production test used in this study included words that show each vowel in three different settings; followed by a voiced sound, voiceless sound, and followed by nothing (open syllable).

2. Literature Review

Proper communication is no doubt critical to successful interaction, as incorrect pronunciation often results in the listeners' inability to interpret messages conveyed by the speaker (Kobilova, 2022). Change in pronunciation may change meaning and alter the message, and in turn leads to communication breakdown. Thus, pronunciation is thought to be a "must" skill for EFL and ESL learners including Arabs. With regard to Arabic speakers in general and Iraqi speakers of English in particular, pronunciation is still acquired with considerable struggle. This has been stressed by Al Abdely (2021, p. 154) stating that "Iraqi EFL learners of English are reported to show accented pronunciation on the segmental level, which might affect their speech intelligibility". There are several factors leading to accented pronunciation of FL/L2 segments. Of these factors, L1 transfer always comes first. Orthographic differences are also influential in this respect. These two factors are discussed below with special reference to vowel length.

2.1 Arabic and English Vowel Systems

English and Arabic have two different vowel systems as English has twenty-two vowels, while MSA has only six vowels (Akbar et al., 2020). Other studies such as Taqi et al. (2018) state that Arabic has only eight distinct vowels. Nevertheless, the vowel inventory of Arabic varies in nature and number based on the speaker's dialect. Some Arabic accents such Iraqi Arabic was reported by Al Abdely & Thai (2016) to have nine distinct vowels. The greater the difference between L1 and L2 vowels systems, the more negative transfer is expected to take place in the pronunciation of the target language vowels.

Contrastive analysis in the acquisition of L2 is the "approach that compares the features of the first language and second language to determine the similarities and differences between them" (Al-Zoubi, 2019, p. 15). Each vowel in Arabic has a set of features that makes it distinctive from all other vowels in the language inventory. These feature, according to Yeaqub (2018, p. 95) include "the shape of the lips, which may be rounded neutrophil or spread. The second property is the position of the tongue, which can be front, middle or back. Finally, the tongue may be raised giving different vowel qualities". In addition to the spectral features mentioned above, vowel length or duration is another important feature that distinguishes one vowel from another (Farran et al., 2022).

2.2 Vowel Length in Arabic and English

Alqarni (2018) claims that several scholars debated that Arabic short vowels "vary qualitatively and quantitatively from their short counterparts". Moreover, they claim that short vowels in Palestinian Arabic [an

Arabic variety spoken in Palestine] are more "lowered and centralized" (p. 104). However, this is not a settled issue as some other scholars such as Al-Numair (2021, p. 92) believes that "vowel length is contrastive in JA, and long and short vowels share the same vowel quality and differ only in duration". In the same vein, Al Thalab & Alwan (2022) argue that long vowels are located and produced in the same location, but differ only in length. Paschen et al. (2022, p. 2) state that "in some languages, vowel length is lexically distinctive (e. g. Finnish tuuli 'wind' vs. tuli 'fire'), while in other languages it is not". They elaborate that languages with lexical vowel length usually comprise a binary distinction between long and short (as in Hungarian, Finnish, Japanese), and in rare cases a ternary distinction between short, long, and overlong as in Estonian or Dinka (Paschen et al., 2022, p. 2). On the other hand, vowel length can be phonemic in in most English varieties; yet, in some others, such as Australian, it is. As for British, which is the variety taught in Iraqi educational institutions, vowel length is commonly phonemic and clearly observed among English vowels (Malas, 2023).

Different English dialects, more specifically RP English and AM English, vowel length varies in accordance to the voicing features of the following consonant. Consequently, vowels tend to be weaker and shorter when followed by a voiceless consonant. Conversely, they tend to be stronger and longer than usual when followed by a voiced one (Keith et al., 1988). The same seems to be true with regard to Arabic, as vowel length also varies due to phonological context. Vowel length can be affected by gemination, for example, which has been explored in terms of MSA and some of its varieties (Abdulrahman & Ramamoorthy, 2018).

3.2 Vowels Pronunciation and Orthography

In fact, there are 26 letters in English that comprise its orthographic system. Moreover, English has only five vowel letters (a, e, i, o, u); yet, its consonantal system comprises 21 letters. Of these letters, Dhayef & Al-Aassam (2020, p. 5) state that only the letter "y" can pose problems. They elaborate that sometimes (y) "stands for a vowel sound especially when coming at the end or somewhere in the middle of a word, as in city, physical". Word initially, the same letter "stands for a consonant, as in yet". Furthermore, the five vowel letters found in English result in 20 distinct vowels. Hence, "there is certainly not a one-to-one correspondence between letters and sounds, and English has many more vowel sounds than vowel letters" (Yoshida. 2014, p. 1). Spelling-pronunciation inconsistent relationship poses an extra challenge in EFL learners' pursuit to learn the target language sound system.

On the other hand, "Arabic vowels have clear representation when it comes to the written form. Only long vowels are transcribed in Arabic orthography. On the other hand, short vowels cannot usually be seen in written forms" Al-Numair (2021, p. 92). Short vowel are only represented using what is so called in Arabic "حركات" or what is so called in English "diacritics" as they are diacritics placed above or below words to represent these vowels. The problem is that these diacritics are not often printed or typed as they require more time in writing and more experience in typing. Hence, writers do not always show them, and consequently they pose more problems for readers.

4.2 Previous Related Studies

Previous studies (Han, 1962; Hirata, 2004; Kozasa, 2005) concluded that short and long vowels differ from each other in terms of duration, that is, long vowels are about 2.4 times longer than short vowels (Akaba, 2008). It is widely said that the main acoustic matchup of the phonemic short and long vowel distinction is vowel duration (Han, 1962; Hirata, 2004; Kozasa, 2005), although small differences were observed in terms of vowel quality of short and long vowels (Kondo,1995). As it was mentioned earlier, vowel length can be contrastive in several languages including "Arabic, Finnish, Korean, Japanese, and Estonian", but not in other such as English and Spanish (Al-Deen, 2018, p. 10). This difference is highly significant "in cross-linguistic studies and cannot be overlooked, especially when the comparison is held between a language with phonemic distinction and another that lacks this distinction (Ibid). Motivated by this assumption, many studies approached the effect of this difference on various learners of English, namely Arab learners. The following is a review of the most related studies to vowel pronunciation, vowel length variation, and its effect on learning English vowels.

Some studies examined vowel length in Arabic with reference to other languages, not including English, such as Tsukada (2012), and Tsukada et al. (2012), which were interested in examining the perception of vowel length in Arabic and Japanese by listeners, who belong to different linguistic backgrounds and have various levels of experience with these languages. Both studies concluded that listeners with no experience with Arabic vowel length performed inaccurately and without significant differences among them. With regard to Japanese,

listeners achieved various levels of success based on how familiar they are with Japanese supporting the assumption that when familiarity level is limited, accuracy in vowel length perception is not good enough. Another conclusion these studies offered is that experience with one language is not necessarily carried over cross linguistically.

Another perception-based study of vowel length was conducted by Hamid and Salih (2022). They investigated Central Kurdish (CK), a language spoken in the Northern part of Iraq, listeners' ability to perceive vowel length. To this end, 19 females and 11 male native speakers of CK were asked to respond to an AX speech perception test. The study adopted a quantitative method in collecting and analyzing data. CK with a range of 6-9 simple vowels is not phonologically contrastive with respect to vowel length; yet, it is in terms of vowels' spectral features. The study showed that native speakers of CK revealed good overall discrimination ability with most vowel contrasts ranging from highest correct percentage (100%) with the pair (/æ/, /a:/) and the minimum correct percentage (60%) for the pair (/ʊ/, /u:/). The three aforementioned studies differ from the current one as these were interested in perception, while the current study is about production of vowel length. Moreover, the current study is interested in how well Iraqi learners realize vowel length variation in English as a foreign language. Though Hamid and Salih's is also interested in EFL learners' performance; however, its data is collected from a sample with different L1 that is Iraqi Kurdish.

Rassam (2008) conducted a study to examine Iraqi EFL learners' realization of vowel length in fortis and lenis contexts. The work aimed to identify twelve Iraqi learners' ability to produce shortened vowels in one and more syllable words. The study instrument was a questionnaire that required learners to transcribe "twelve pairs of items…with emphasis on clipped vowels". The study concluded that learners showed low accuracy in shortening pre-fortis vowels. Nevertheless, the study concluded that learners' pronunciation was intelligible as they tried their best to approximate RP nativelike pronunciation. This study is different from the current one in the way data is collected. The present study collects data from a production test, while Rassam's collected data from a questionnaire, which cannot be reliable enough. The transcription submitted by learners in the questionnaire cannot by any means reflect their actual pronunciation. Al Thalab and Alwan (2022) investigated the perception, identification, and pronunciation of semivowels and vowels found in Arabic and English as produced by 36 speakers divided into six groups based on their proficiency level. The stimuli adopted in the study comprised 20 words that showed short, long, and semivowels. Gender variable was also attested in this study. The study concluded that Iraqi learners encounter major difficulties in the pronunciation of FL simple vowels. They also tend to diphthongize long vowels. Gender variable was found influential in the performance of Iraqi EFL learners. This study is different from the current one as it did not deal with vowel length on its own. The study was rather focused on the pronunciation of long vowels without paying attention to vowel length variation, which is the basic concern of the current study.

Ahmed and Al-Heety (2022) examined the phenomenon of English short vowels lengthening in the pronunciation of Iraqi EFL learners at the university level. Fifty English words were given to 25 learners to pronounce in a production test. The aim was to identify reasons behind producing short vowels with more than required length. The study concluded that L1 transfer, orthography, and analogy were the reasons that motivated speakers to lengthen short vowels. However, this study was auditorily based i.e. it did not conduct an acoustic analysis to obtain accurate measures of vowel length as it is intended in the current study. Again, this study was not interested in vowel length variation based on context. Its basic interest was in the process of lengthening short vowels. Khalaf and Mohammed (2022a) and Khalaf and Mohammed (2022b) recorded the speech of 60 male and female Iraqi EFL learners, who use two different Iraqi dialects to identify the errors made by these learners in the pronunciation of English vowels. They acoustically analyzed the informants' pronunciation for vowel formants and duration to identify difficulties encountered by learners. They also used these measures to identify any significant difference among speakers based on dialectal (2022b) and gender (2022a) differences respectively. Both variables were found to be statically significant where female speakers produced vowels with longer duration compared to males (2022a). Informants in (2022b) produced shorter vowels compared to natives, moreover, speakers of Gilit dialect "produced vowels longer than their Qeltu peers except in the case of /ɒ, i:/" (p. 70). However, cross dialectal difference was not reported with regard to length difference.

Based on the review provided above, it can be concluded that vowel length variation in the pronunciation of Arabic speakers has not been received due attention; especially when considering spoken dialects of Arabic. More specifically, very few studies have explored the effect of vowel context on vowel length. In spite of the fact that length is a significant cue Arab EFL learners employ to identify and pronounce long vowels, very few studies

have attempted examining it. Some of the studies reviewed above were perceptually motivated such as Tsukada (2012); Tsukada et al. (2012), and Hamid and Salih (2022). Some others were auditorily based such as Ahmed and Al-Heety (2022). On the other hand, Al Thalab and Alwan (2022); Khalaf and Mohammed (2022a), and Khalaf and Mohammed (2022b) did conducted acoustic analysis of vowels; however, they were not after vowel length variation as it is the case in the current study. Hopefully, the current study fills in this gap in the literature as it acoustically analyses vowel length variation as produced by Iraqi EFL learners with special attention to gender effect on this variation. Hence, the present study attempts to answer the question whether Iraqi EFL learners are aware of variations in vowel length resulting from variations in phonetic context. The study also attempts to answer the question whether gender variable has any effect on learners' pronunciation of RPE pure vowels in voiced, voiceless, and open settings.

3. Method

The method adopted in this study is a quantitative one that depends on vowel length measurements of the pronunciation of Iraqi EFL learners. The mean values of these measurements are used in identifying length variations and then identifying gender effect on the realization of vowel length. Hence, the data is collected and analyzed in a quantitative way. The research design adopted is ex post facto design that deals with the data as they are without any manipulation, and it also selects participants and stimuli purposefully.

3. 1 Speakers

Twenty male and female speakers of English were purposefully recruited to represent the population of this study. The selected participants all speak Arabic as their first language and speak Baghdadi Arabic (Gelet dialect) as their Iraqi accent. They are all learning English as a foreign language at Iraqi universities. No one of the selected participants had a previous experience of living in an English speaking setting for a considerable period of time. From among the big number of learners who were available based on the demographic information collected, 20 (10 males, 10 females) informants were randomly selected to be the informants of this study. At the time of the test, participants' ages range was 20-37 years old. The informants are unpaid and willingly participated in the study signing a consent letter certifying that. The following table (1) shows age ranges for the study informants.

Table 1. Aged and gender of the participants

Gender	Age 20-28	29-37
Females	4	6
Males	3	7

3.2 Stimuli

The production test conducted in this study included 60 words that show English simple vowels three times each. The three words present the vowel in question when it is followed by a voiced sound, another when it is followed by a voiceless sound, a third when the vowel is at the end of an open syllable without any consonant under the coda of the syllable. Due to the fact that some RPE monophthongs such as (/ɔ, æ, ʌ) cannot be found in final word position, words in which these monophthongs are in syllable final position were used instead. Variety in vowel context was meant to identify context effect on vowel duration. The consonants used were voiced and voiceless plosives, nasal, lateral /l/, and fricatives. A list of real words was used in this study even though they do not only reflect learners' lexical knowledge but phonological knowledge as well. Real words, according to Al Abdely (2016, p. 65), is the choice when the study participants are EFL learners "whose knowledge was basically lexically based as they lacked exposure to the native L2, which is necessary to attain detailed phonological and phonetic knowledge". Strange and Shafer (2008) also state that a stimuli of real words is more illustrative of learners' knowledge and ultimately more thoughtful of difficulties learners encounter. Moreover, the words used in this study were considered frequent based on three jury members' judgments, who were asked to decide based on their experience as instructors of English at the University of Anbar if the selected words were familiar to Iraqi EFL learners. Their comments and suggestions were considered to arrive at the final word list. For the full list of words, see Appendix (A).   This aim is to identify if the variations found in native

speakers' pronunciation of these vowels are realized by Iraqi speakers or not. Each Iraqi speaker was asked to pronounce the eleven simple vowels in three different positions and this means that each vowel was attempted 120 times and the overall number of trials for all vowels was 1320. The words used as stimuli here are frequent words with the least number of syllables possible to eliminate any effect of having more than one vowel in the word.

3.3 Procedures

First of all, the researcher selected a list of English real words that show the English simple vowels in three different positions; followed by a voiceless consonant, followed by a voiced consonant, and followed by no sound (zero coda). Second, participants were selected based on the purposes of this study. Participants selected for this study were asked to read as clearly and naturally as they can the list of English words, and their pronunciation was recorded via high quality smart phones. The recordings collected were keyed in PRAAT to be viewed and edited to measure vowel length. Means of vowel length were calculated and descriptively and statistically analyzed to address the questions raised in the study.

4. Results

This section offers the results obtained in the study. To respond to the questions of this study, numerical and statistical analyses of the study data were conducted. The results are offered according to the vowels under investigation; these vowels are [ʌ], [ɜː], [ɪ] [iː], [ɔː], [ɔ], [æ], [ɑː], [ʊ], and [uː]. First, the results of the acoustic analysis are presented in tables and screen shots taken from PRAAT program to show the pronunciation of vowels by Iraqi males and females. These results are later used to show statistical differences, if any, in the pronunciation of Iraqi speakers based on gender difference. The results are also used to show possible differences in vowel's duration based on setting difference.

4.1 Acoustic Analysis

Table (2) below provides frequencies of vowels as they were produced by the study female informants. The means in the table are presented in three columns to include voiced, voiceless, and open settings in which vowels are located.

Table 2. Vowels' duration as produced by Iraqi female speakers in three settings

| Vowels	Voiced	Voiceless	Open
ʌ	143.55	148	123.5
ɜː	148.8	158.8	135
ɪ	137.9	125.05	110.45
ɔː	165.15	178.6	184.8
ɔ	158.45	136.6	146.6
ʊ	140.55	188.05	122
æ	172.4	161.05	134.55
ɑː	175.15	162.7	185.85
i:	184.05	173.35	220.75
u:	193.7	176	237.1

Here follows some screen shots taken from PRATT program to show the pronunciation of some English simple vowels by Iraqi female speakers.
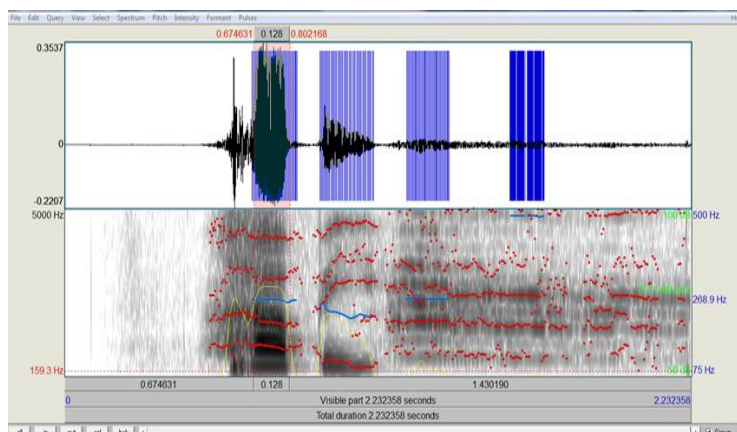
Figure 1. Spectrogram of the vowel /ɪ/ in the word "Dinner"
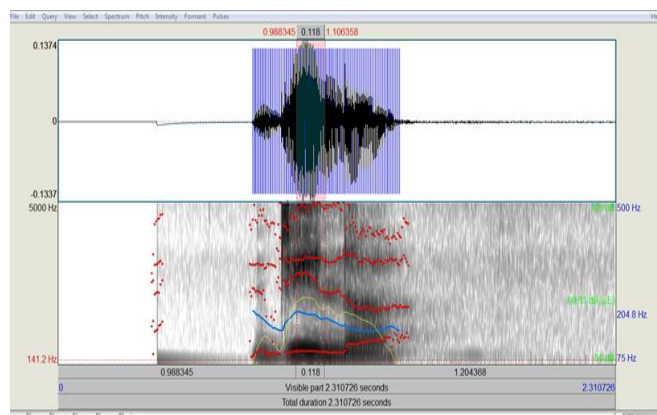
The short vowel /ɪ/ in the word above is followed by the alveolar voiced nasal consonant /n/.

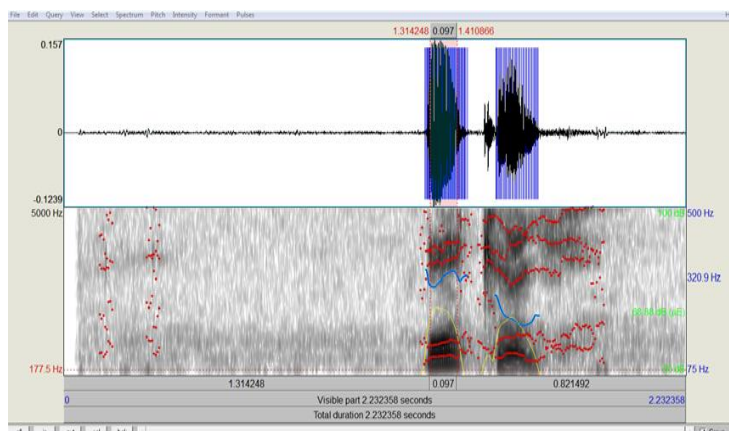Figure 2. Spectrogram of the vowel /ɜː/ in the word "perfect"
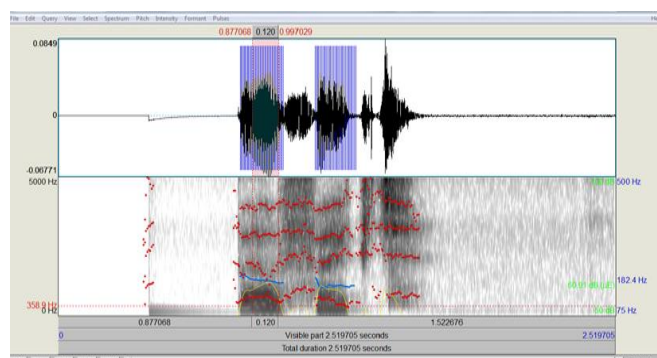
The long vowel /ɜː/ in the word is followed by the labiodentals voiceless fricative consonant /f/.

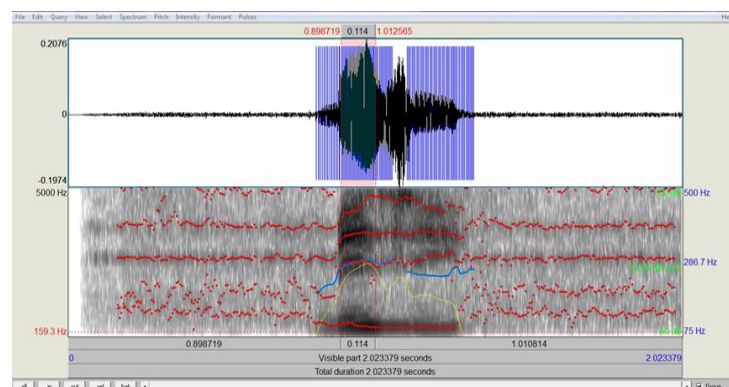Figure 3. Spectrogram of the vowel /æ/ in the word "happy"

The short vowel /æ/ in the word "happy" is followed by the bilabial voiceless stop /p/.

Figure 4. Spectrogram of the vowel /ɔ/ in the word "bottle"

Here the short vowel /ɔ/ is followed by the voiceless alveolar stop consonant /t/.

Figure 5. Spectrogram of the vowel /I/ in the word "busy"

Here the short vowel /I/ is followed by the voiced alveolar fricative consonant /z/.

Table (3) below shows the duration means for the pronunciation of English simple vowels as produced by Iraqi male speakers in the three different settings under examination in this study.

Table 3. Vowel duration means as produced by Iraqi male speakers in three settings

vowels	Voiced	Voiceless	Open
ʌ	117.95	112.35	109.55
ɜː	115.3	123.15	102.55
ɪ	103.25	100	103.45
ɔː	157.25	146.4	153.45
ɔ	143.9	118.85	104.2
ʊ	119.75	127.4	112.05
æ	155.7	135.85	112.2
ɑː	154.8	177.75	153.15
iː	174.65	180.05	188.75
u:	155.35	152.8	237.1

Here follows some screenshots taken from PRATT program to show the pronunciation of some English simple vowels by Iraqi male speakers.

Figure 6. Spectrogram of the vowel /ɔ/ in the word "bottle"

The vowel /ɔ/ in this word is preceded by the alveolar stop consonant /t/.

Figure 7. Spectrogram of the vowel /ɪ / in the word "busy"

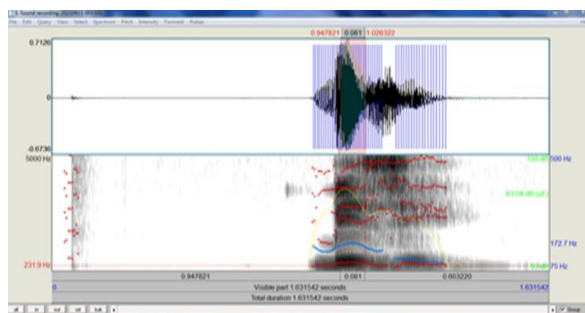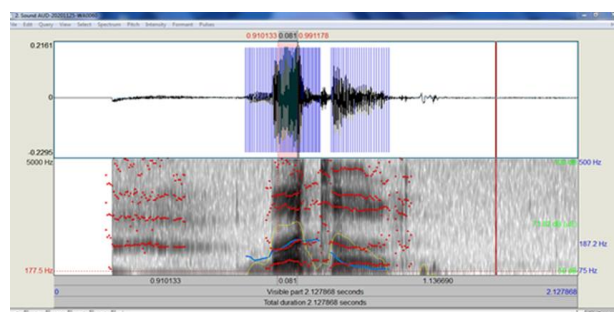Here the vowel is preceded by the voiced alveolar fricative /z/.

Figure 8. Spectrogram of the vowel /ʌ/ in the word "cut"
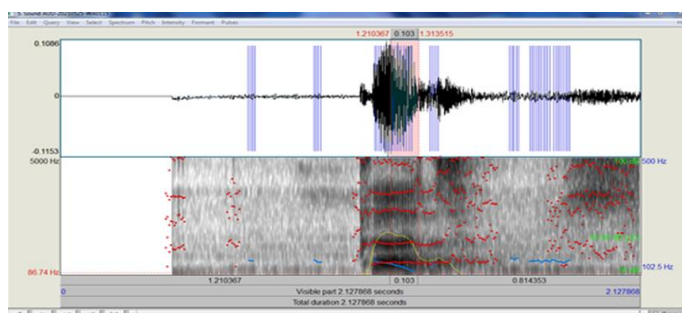
The vowel here is preceded by the alveolar voiceless stop consonant /t/.

Figure 9. Spectrogram of the vowel /ɪ/ in the word "pick"

The vowel /ɪ/ is preceded by the velar voiceless stop consonant /k/.

4.2 Vowel Duration

Vowels' duration means measured in PRAAT are provided in Table (4) below. These means and differences in vowel length are measured in ml/s.

4.2.1 Statistical Analysis of the Effect of Consonant on Vowel Duration

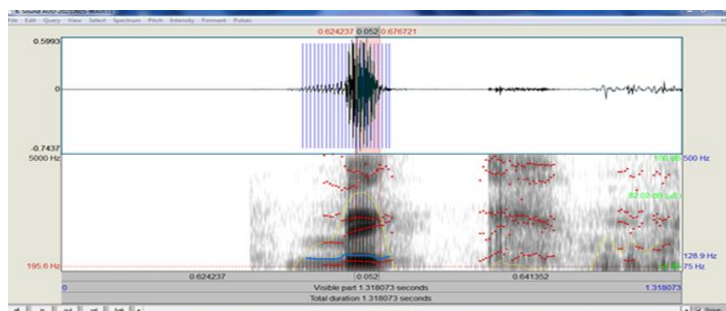To respond to the research question if Iraqi EFL leaners are aware of the variations in the length of vowels resulting from differences in following sounds, overall duration means obtained through PRAAT for both males and females were compared statistically using paired samples T.Tests. The results of the statistical tests are provided in Table (4) below.

Table 4. Results of paired samples T.Tests

		Mean	Std. Deviation	Sig 2-tailed)
Pair 1	voiced-M- open- M	2.144	34.341	.848
Pair 2	voiceless-M- open-M	-.0860	32.106	.993
Pair 3	voiced- F - open- F	1.850	27.776	.838
Pair 4	voiceless- F - open- F	.7600	38.141	.951

Based on the results of paired samples T.Tests presented in Table (4) above, there are no differences in vowel length based on the context of the vowel. Male and female Iraqi EFL learners were both unable to show variations in vowel length in three settings. This means that they were not aware of such variation when the nature of the following sound is different. More specifically, whether a particular vowel is located in an open, voiced, or voiceless setting, it has not been reflected in significant length variation in the pronunciation of that vowel.

4.2.2 Gender Variable Effect on Vowel Length Variation

As for the difference in the vowel length between males and females, vowel length means were compared between males and females to identify any numerical differences in vowel length based on gender variable. The results of these comparisons are tabulated in Table (5) below.

Table 5. Results of group Statistics with reference to gender

Group Statistics					
Setting	**gender**	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Voiced	**M**	**10**	**139.7900**	**23.73704**	**7.50631**
	F	**10**	**161.9100**	**19.34015**	**6.11589**
Voiceless	**M**	**10**	**137.5600**	**26.79112**	**8.47210**
	F	**10**	**160.8200**	**19.67276**	**6.22107**
Open	**M**	**10**	**137.6460**	**45.46751**	**14.37809**
	F	**10**	**160.0600**	**44.22407**	**13.98488**

It is clear from the mean values obtained for the two groups that females tend to pronounce vowels with more length in all positions. To identify if these numerical difference in the vowel length between males and females are statistically significant or not, three independent samples T.Tests have been conducted to identify any significant difference in vowel length based on gender variable. The results of these tests are tabulated in Table (6) below.

Table 6. Results of independent samples T.Tests

		Levene's Test for Equality of Variances		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
		F	Sig.					
Voiced	Equal variances assumed	1.101	.308	-2.285	18	.035	-22.12000	9.68240
	Equal variances not assumed			-2.285	17.294	.035	-22.12000	9.68240
Voiceless	Equal variances assumed	1.276	.273	-2.213	18	.040	-23.26000	10.51086
	Equal variances not assumed			-2.213	16.519	.041	-23.26000	10.51086
Open	Equal variances assumed	.017	.899	-1.117	18	.278	-22.41400	20.05757
	Equal variances not assumed			-1.117	17.986	.278	-22.41400	20.05757

Based on the results of the independent samples T.Tests conducted to identify differences between males and females pronunciation of vowels in the three contexts; voiced, voiceless, and open, statistically significant differences were identified in voiced and voiceless settings. However, no significant difference between males' and females' pronunciation of vowels in open syllables was identified. This means that vowel length was different between the two groups with reference to closed settings, while in an open setting differences were not existent.

5. Discussion

This research is about Iraqi EFL learners' realization of the length variation in the pronunciation of English vowels. It aimed at adding to existing literature related to FL pronunciation in general and Iraqi EFL learners in particular. The basic motivation behind conducting such a study is the foreign accented pronunciation Iraqi speakers still show despite the fact that they are actually achieving progress in other areas of FL acquisition. The study was also motivated by the fact expressed by Alahmari (2022, p. 204) "that English and Arabic vowel systems are significantly different from one another, with English being a language with a rich vowel system compared to the far simpler Arabic vowel system". This difference often results in problems for Arab EFL learners, and the present study was an endeavor to explore one of these problems. Moreover, Al Abdely (2016, p. 56) states that "difficulties learners face in the perception and production of vowels could be one of the reasons that Iraqi EFL learners still show accented English pronunciation". Hence, the current study was a continuation of endeavors targeting EFL learners' foreign accented pronunciation called for by several scholars. To name one, Derwing & Munro (2005) call for more studies to develop our perception of the concept of accented pronunciation and the destructive influence it can have on everyday social interaction. Derwing & Munro (2005) elaborate that examinations of accented pronunciation help teachers and learners identify learning aims, find appropriate pedagogical urgencies for the English language class, and outline the most effective approaches of teaching.

With reference to the research question about Iraqi EFL learners' awareness level of the effect of phonetic context variation on vowel length, the acoustic analysis conducted in this study revealed numerical differences in the length of English vowels based on their setting as shown in Tables 2 and 3 for females and males respectively. There was not a regular pattern in the variations in vowel length as sometimes a vowel such as /ʌ/ is longer when followed by a voiceless consonant; yet, a vowel such as /ɪ/ is longer when followed by a voiced consonant. The vowel /i:/is longer in open setting than when followed by a consonant. These results refer to the fact that Iraqi EFL learners are unable to realize variations in vowel length when the setting is changed. This stresses the need for more practice in vowels' phonetic features and their variations. This need was highlighted in the results of the paired samples T. Tests, which did not indicate any significant differences in vowel length.

This result is somehow unexpected as Iraqi EFL learners do have long/short distinction between vowels (Al Abdely & Thai, 2016). According to Whang et al. (2019), durational cues help listeners perceive short long/short segments, and this correct perception would be eventually reflected on their production of vowels. The difficulty encountered by Iraqi EFL learners has been also reported with reference to several other foreign learners such as "Mandarin, Cantonese, Japanese, Korean, Dutch, or German" (Reinisch & Penney, 2019, pp, 1-2). Vowel length, which is a feature found in Arabic to distinguish short from long vowels can interfere negatively in pronouncing long vowels as Arabic speakers tend to lengthen vowels more than required.

One of the problems that explained EFL learners' inability to realize specific phonetic details such as vowel length is the fact that listening and speaking skills are ignored in the foreign educational setting. According to Nowrouzi et al. (2015), cited in Yunira (2019, p. 23), "listening for EFL, especially in a foreign language context where real practice chances are narrow" is difficult to practice and develop. Another possible interpretation of the results obtained in this study is found in Al Tamimi (2007) cited in Kalaldeh (2018, p. 24), who conducted a study on the pronunciation of vowels by Jordanian and Moroccan Arabic speakers. He claimed that in "both Jordanian and Moroccan Arabic there was no significant difference between the production of vowels in 'words' and in 'syllables', but a very significant one when compared with 'isolated' vowels". Based on the above, Arabic speakers/listeners are not aware of vowel differences in English vowels based on context because Arabic vowels never occur in isolation. Arabic vowels vary in length only when they are alone, while in connected speech, they do not show vowel length variation.

With reference to the research question about gender variable effect on Iraqi EFL learners' pronunciation of pure vowels, gender variable has been detected to be effective in terms of the length of some vowels when their setting is altered. The differences were significant in terms of voiced and voiceless settings only, while open setting showed no difference. Iraqi female learners tended to produce vowels with more length in all positions (Table 6). This could be related to their knowledge about vowel length, and it could be another socio, or psycho variable. Therefore, this area requires further investigation to validate the results of the current study and search for possible reasons for this gender variation.

6. Conclusion

With reference to the aims and research questions attempted, the current study arrived at several conclusions. The study revealed Iraqi EFL learners' low awareness level in vowel length variations resulting from variations in phonetic context. This conclusion indicates a need for more practice on learners' part and more emphasis on phonetic details allocated by teachers of English. The study concluded that even advanced struggle with vowels realization in different contexts. This struggle was identified in pronouncing isolated words and definitely more difficulties are expected in pronouncing utterances in connected speech. This also invites teachers, learners, and textbook designers to pay more attention to pronunciation skills since FL learners still lag behind in their progress compared to other language skills. Gender variable has also been reported to significantly affect learners' performance in pronouncing vowels in different contexts. This difference should also be taken into consideration when teaching vowel length to Iraqi EFL learners.

The current study filled a gap in the literature via investigating vowel length variation acoustically with reference to Iraqi EFL learners. Nevertheless, the concept of vowel length variation can be further investigated in terms of other Iraqi learners, who speak a different dialect, belong to a different age range, or belong to a different proficiency level in English. Variation in vowel length can be also investigated in terms of speakers' influence by listening to native and non-native talkers to check their convergence or divergence to or away from these talkers. Vowel pronunciation can also be investigated with reference to orthography effect. According to Deacon (2017), Arab learners of English make more vowel errors considerably due to spelling effect that is

inconsistent in English. Spelling-pronunciation inconsistency in English has been always considered a major issue when investigating Arab learners' acquisition of English pronunciation. Actually, Arabic is described as a language with almost perfect spelling-pronunciation correspondence where each and every single letter is pronounced and always in the same way. Whereas the case in English is highly different where a letter can be pronounced in different ways, a letter may not be realized in pronunciation, and a particular sound can be the result of different letters. All of these cases and several others may hinder the learning process. Thus, more attention should be laid to the orthography effect on English language acquisition.

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Appendices

Appendix 1

No	Word	Transcription	Vowel targeted	Context
1	Read	/riːd/	/iː/	Voiced
2	Team	/tiːm/	/iː/	Voiced
3	Meet	/miːt/	/iː/	Voiceless
4	Sleep	/sliːp/	/iː/	Voiceless
5	Be	/biː/	/iː/	open
6	See	/siː/	/iː/	open
7	Dinner	/dɪnə/	/ɪ/	Voiced
8	In	/ɪn/	/ɪ/	Voiced
9	Tip	/tɪp/	/ɪ/	Voiceless
10	Pick	/pɪk/	/ɪ/	Voiceless
11	Busy	/bɪzɪ/	/ɪ/	open
12	Pity	/pɪtɪ/	/ɪ/	open
13	Order	/ɔːdə/	/ɔː/	Voiced
14	Cord	/kɔːd/	/ɔː/	Voiced
15	Port	/pɔːt/	/ɔː/	Voiceless
16	Short	/ʃɔːt/	/ɔː/	Voiceless
17	More	/mɔː/	/ɔː/	open
18	Law	/lɔː/	/ɔː/	open
19	Dog	/dɔg/	/ɔ/	Voiced
20	Cog	/kɔg/	/ɔ/	Voiced
21	Not	/nɔt/	/ɔ/	Voiceless
22	Shot	/ʃɔt/	/ɔ/	Voiceless
23	bottom	/bɔ.təm/	/ɔ/	open
24	Bottle	/bɔ.təl/	/ɔ/	open
25	Rude	/ruːd/	/uː/	Voiced
26	Room	/ruːm/	/uː/	Voiced
27	Lucy	/lʊːsɪ/	/uː/	Voiceless
28	Root	/ruːt/	/uː/	Voiceless
29	Do	/duː/	/uː/	open
30	Chew	/tʃuː/	/uː/	open
31	Full	/ful/	/ʊ/	Voiced
32	Pull	/pʊl/	/ʊ/	Voiced
33	Look	/lʊk/	/ʊ/	Voiceless
34	Push	/pʊʃ/	/ʊ/	Voiceless
35	Bully	/bʊ.lɪ/	/ʊ/	open
36	Duress	/bʊ.dɪ/	/ʊ/	open
37	Army	/aːmɪ/	/aː/	Voiced
38	Garden	/gaːdən/	/aː/	Voiced
39	Party	/paːtɪ/	/aː/	Voiceless
40	Class	/klaːs/	/aː/	Voiceless
41	Car	/kaː/	/aː/	open
42	Bar	/baː/	/aː/	open
43	Land	/lænd/	/æ/	Voiced
44	Mad	/mæd/	/æ/	Voiced

45	Apple	/æpƏl/	/æ/	Voiceless
46	Cat	/kæt/	/æ/	Voiceless
47	Mama	/mæmæ/	/æ/	open
48	Happy	/hæ.pɪ/	/æ/	open
49	Bird	/bɜːd/	/ɜː/	Voiced
50	Murder	/mɜː.dθ/	/ɜː/	Voiced
51	Perfect	/pɜː.fekt/	/ɜː/	Voiceless
52	Hurt	/hɜːt/	/ɜː/	Voiceless
53	Thirsty	/θɜː.stɪ/	/ɜː/	open
54	Thirty	/θɜː.tɪ/	/ɜː/	open
55	Bun	/bʌn/	/ʌ/	Voiced
56	Lunch	/lʌntʃ/	/ʌ/	Voiced
57	Bus	/bʌt/	/ʌ/	Voiceless
58	Cut	/kʌt/	/ʌ/	Voiceless
59	Summer	/sʌ.mƏ/	/ʌ/	open
60	Drummer	/drʌ.mƏ/	/ʌ/	open