The Perception of English Vowels by Kurdish EFL Learners

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***Abstract*—This paper investigates English vowel perception in a formal classroom setting by Central Kurdish (CK) learners of English (i.e. EFL learners at university level in The Kurdistan Region of Iraq). Ten English vowels were used as stimuli: five monophthongs with similar qualities but different quantities. The participants included 30 first year English majors. They were tested while performing a discrimination task. The task to discriminate 50 pairs of RP English vowel contrasts was an AX style task. The RP vowels differed from the CK vowels in both quality and quantity. As stated by the Perceptual Assimilation Model L2, the results demonstrated a variety of assimilation types (PAM-L2). It was more difficult to distinguish between two sets of similar vowels. Furthermore, closer vowel contrasts in the vowel space were more difficult to distinguish. To the best of our knowledge, no previous research has looked into Kurdish EFL students' perceptions of English vowels. The perception of English vowels by these Kurdish English learners mostly agreed with PAM's predictions, and the results of the discrimination task ranged from excellent to poor.**

***Index Terms*— EFL, English, Kurdish, Vowels, Perception**

I. INTRODUCTION

Languages conflict not only according to the number of vowels used to compare meaning, but in relations to the phonetic properties too, which are used to illustrate the vowels they possess. These kinds of variations should have associations in terms of how hearers perceive vowels, especially in the instance of recognizing phonetic qualities and quantities that are not characterized in a listeners' native language (L1). Scholars examining this occurrence have developed numeral theoretical models to explain repetitions detected in non-native speech perception, to sort the methods non-native phones are categorized and distinguished relative to native categories (Best, 1995; Escudero 2005, 2009), and to determine how challenging it is for L2 learners to form new phonetic categories. These models comprise the Perceptual Assimilation Model (PAM: Best 1993, 1994, 1995), followed by PAM-L2 (Best & Tyler 2007); Second Language Linguistic Perception (L2LP: Escudero 2009); and the Speech Learning Model (SLM: Flege 1995), among others. However, not all components of perception have been addressed in nonnative speech perception studies. Contrasts between non-native consonants have been examined more extensively than vowels. (Tyler et al. 2014). PAM research has concentrated on non-native naive listeners, whereas PAM-L2, SLM, and L2LP investigations have focused on L2 learners who have spent a specific amount of time in L2-dominant contexts. In the meantime, there have been few research on learners learning an L2 in a formalized classroom setting in an L1-dominant country. Furthermore, few language combinations were explored in the few researches on L2 vowel perception among the non-studied languages is Kurdish. When a learner's L1 has an average 5-7 vowel system and the L2 has an intensely rich vocalic system with up to a dozen vowels, perceptual attunement to the L1 might demonstrate particularly high during L2 acquisition. That is the case in our current study of Kurdish as a first language and English as a second language.

The object of this study is to add more experiential data to the investigation on native Kurdish speakers' perception of English vowels in a second language. Previous research has focused on how Kurdish speakers produce English sounds. This study investigates pre-lexical phonological categorization by focusing on the perception of English vowels and investigating the influence of stimulus type by including vowel perception in real words.

The current paper is structured into 4 sections. Section 1 comprises of a concise overview to the field and the gap the present study attempts to fill. Section 2 is divided into two parts. First the material in which it explains the sound inventories of the languages examined in the current study, namely Central Kurdish (the participants' L1) and standard Received British English (the participants' target L2). Second, the method, explaining the methodology used, describing the experimental design, the participants, testing tasks, and the process that formed part of the current study. Section 3 is again divided into two parts. First, it presents the results obtained from the test conducted. The second part offers the reader with a discussion of the results. Section 4, summarizes and concludes the study.

II. MATERIAL AND METHOD

A. Material

This section aims to first describe RP English vowels then CK vowels. The current chapter is a comparison between the two languages' vowel systems. The purpose of this chapter is to give a background review on the vowel system of both

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languages. Hence, it is not an attempt to establish Central Kurdish CK vowels.

1) RP English Vowels

Vowels contrast from consonants in two main ways: they are articulated exclusive of creating any form of blockage in the mouth cavity, i.e. the articulators do not cause a comprehensive or incomplete closure or a restricted channel in the course of the respired air. Vowels, contradictorily, differ from consonants in their behavior. Vowels make the very heart of the syllable and mostly appear in syllable central position, whereas consonants often appear in syllable peripheral locations, i.e. near the syllable's edges.

There are two sorts of criteria that can be used to categorize vowel sounds: phonetic and phonological. In the first situation, the categorization is grounded on articulatory qualities, but in the second case, the classification is based on certain characteristics of vowel behavior.

The first part of this section will look at how phonetic classes can be described in the English vowel system. The location of the tongue during articulation is quite consistent in some vowels. Putting it another way, the tongue does not move during the creation of vowels. Monophthongs are the name for such vowels. However, in some vowels, the location of the tongue at the start of the vowel varies significantly from that at the end of the vowel, implying that tongue movement is involved. These vowels are known as diphthongs (and triphthongs). This distinction can also be thought of as a distinction in the number of vowels found within a single syllable. Monophthongs have one, diphthongs have two, and triphthongs have three syllables. Long vowels are roughly twofold as long as short vowels in terms of duration. It's also worth noting that diphthongs and triphthongs have the same length as long monophthongs. When talking about long vowels, long monophthongs, diphthongs, and triphthongs are meant all at once. Furthermore, length in English vowels contrasts depending on context, thus length is not a stable characteristic.

TABLE 1
The monophthongs vowels of RP English

Short vowels	Long vowels
ɪ, ʊ, ɛ, ɒ, ʌ, æ, ə	ɑː, iː, uː, ɔː, ɜː

There is also a quality difference in English short-long vowel pairs; That is, there is no English short-long vowel pair in which the two vowels have identical qualities. The phonetic symbols used to demonstrate them reflect this. Therefore, whereas there is a short /ɪ/ and a long /iː/, there is no /ɪː/; likewise, whereas there is a short /ʊ/ and a long /uː/ there is no /ʊː/.

In terms of phonological categorizations of vowels, the two main phonological categories are built on the sort of syllable in which the vowel surfaces. English stress can appear on any syllable. English unstressed syllables just have condensed vowels, which are shorter, fainter, and nearer to schwa /ə/. Therefore, in unstressed syllables weak vowels such as /ə/, /ɪ/, and /ʊ/ might be located whereas in stressed syllables only supposed full vowels can be detected i.e. all remaining vowels in English, including /ɪ/ and /ʊ/, which, in addition to appearing in unstressed syllables, can also take the role of full vowels.

Inside the category of full vowels, there are two subcategories: tense and lax vowels. These two terms must be used with caution because they are frequently used as phonetic labels as well. These terminologies denote to the muscles sited at the back of the tongue, alongside the back wall of the pharynx, in a phonetic sense (throat). When these muscles are tense, the vowel is tense, when they are not tense, the vowel is lax. This tense and lax definition is usually similar to that proposed by Jakobson, Fant, and Halle they emphasize that tense phonemes are articulated with better clarity and weight than lax phonemes. Muscular pressure influences the tongue, vocal tract walls, and glottis. The greater the tension, the more the vocal tract deforms from its initial position. This corresponds to the fact that tense phonemes last longer than lax phonemes (1952, P.38). The places of articulation of the monophthongs of RP are as follows:

TABLE 2
Places of articulation of the monophthongs of RP

	Front	Central	Back	
	Unrounded	Unrounded	Unrounded	Rounded
Close	Beat / iː/	-	-	Boot /uː/
Half – close	Bit / ɪ/	Ago /ə/ Burn /ɜː/	-	Put /ʊ/
Half open	Bet /ɛ/		-	Bought / ɔː/
Open	Bat /æ/	But /ʌ/	Bar /ɑː/	Bob /ɒ/

Furthermore, close vowels are frequently indicated to as high, open vowels as low, and those in between as mid. As shown in the table above, the following generalizations can be made. Except for a few exceptions, front and central vowels are unrounded, whilst back vowels are rounded. /ɑː/.

A vowel's quality is regularly defined by three simple variables: open/close, front/back, and rounded/unrounded. The first two are determined by the place of the tongue's highest point when forming the vowel. Scholars such as (Harrington 2010) have suggested these variables, mostly open/close and front/back, are more closely associated to the acoustics of the vowel than its articulation, because each speaker fabricates each vowel in a variety of ways. Nonetheless, conventional markers are an efficient means of defining the quality of vowels when they do not accurately suggest their actual articulation.

The quality of the vowels might be represented by a vowel quadrilateral, like the one shown in Figure 1, the front vowels are located on the left and the back vowels are located on the right, and close vowels are at the top and open vowels are close to the bottom. The figure presented in this paper is two-dimensional thus it does not display rounding, nonetheless in English /uː/, /ʊ/, /ɔː/, and /ɒ/ are entirely rounded. This diagram includes the eleven British English monophthong vowels that occur in stressed syllables.

The schwa /ə/ is an English vowel that is missing from Figure 1 since it can certainly not appear in stressed syllables. Had it been included, it would have occupied the exact space of /ɜː/, hence, bringing up the question of if a distinct icon ought to be used for /ɜː/ and /ə/ or whether the prior ought to be presented

as /əː/, i.e. as a long structure of /ə/. The reasoning behind choosing a dissimilar symbol is that other long/short vowel pairs, such as /iː/ and /ɪ/, are characterized by different symbols, as is the length diacritic, consequently it would be unusual if /ɜː/ and /ə/ were an exemption.

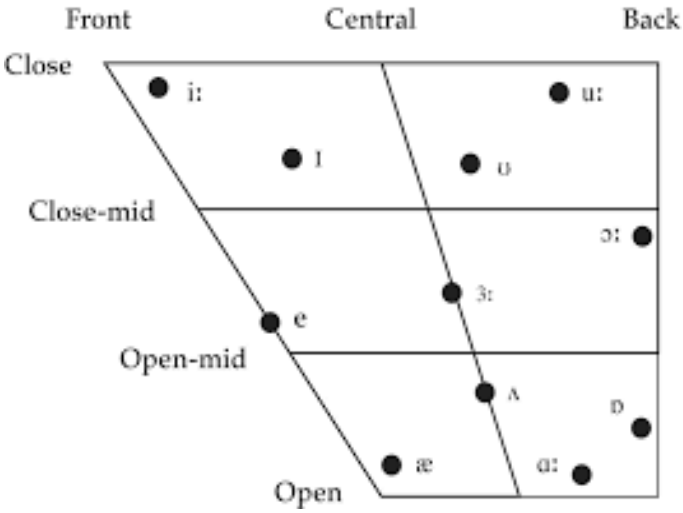

Fig. 1. The monophthong vowels of British English Roach (2009).

The place of some of the vowels in Figure 1 is discussed further in this paragraph, specifically the exact place of /uː/. Acoustic metrics suggest that /uː/ in modern RP Britain English is frequently farther fronted than proposed by Figure 1 (Deterding 2006) and it is becoming more popular among young speakers Hawkins and Midgley (2005). Though, Roach (2009, 16), Wells (2008) displays it as a back vowel and so does Cruttenden (2008, 127), notes that a fronted variant typically appears following the approximant /j/ in words as *youth* and *cute*.

In phonetics, vowel quantity refers to the length of a vowel, shown in phonetic transcription by a length mark [ː] or a colon [:] following a vowel, as in /aː/. Vowels marked with it have a longer duration than the vowels with no such sign. Vowels that have been marked are said to be long, while vowels that are not marked are said to be short, a difference recognized as vowel length. Though, at least two other factors influence the measurable duration of vowels. First, reflecting on vowel height with regard to the place of tongue. Open vowels for example in ban /ban/ or balm /bɑːm/ are longer than close vowels as in bin /bɪn/ or beam/biːm/. The second factor is the situation the vowel occurs in, i.e. which sounds it precedes and/or follows. Some consonants cause vowels to be shortened, while others cause them to be lengthened, such as /uː/ is longer in move /muːv/ than in boot /buːt/. There are phoneticians that think it is better to consider the length mark as a quantity mark instead of a duration mark, and to refer to 'heavy' and 'light' vowels. If a vowel has adequate length, as in halve /haːv/, there is enough time for the organs that comprise it to transfer it into their intentioned places and stay there for a brief period of time prior to moving on to the next target. This type of vowel is known as tense. If the vowel is exceedingly short, the organs must depart from the target the second they arrive, and in strict situations (for example, in six /sɪks/) might not stretch to the objective at all. This type of vowel is known as lax. Tense vowels are more inclined to be peripheral and lax vowels are closer to schwa /ə/, known as the neutral, due to the time necessitated to move to more peripheral vowel spaces.

Acoustically, vowel quality is mainly found to correlate with the first and second frequency components of the vowel spectral range, with the length of the pharyngeal-oral tract, the position of an obstruction, and the intensity of constriction being the most important factors. (e.g., Stevens & House 1955) Furthermore, vowel qualities might well vary in their inherent timeframe. (e.g., Peterson & Lehiste, 1960). A vowel quality involving a rather more severe articulation, for example, may require more time to fully recognize and thus be substantially longer.

To sum up, vowels in several languages could be distinguished by their prosodic usage of vowel quality and quantity. The phonological resonance of a sound that takes place reliant on where the vowel is articulated is known as vowel quality. While, the phonologically distinct length of a vowel in relation to one or more vowels of comparable quality in the language is known to be vowel quantity.

2) Kurdish Vowels

The research findings on the CK vowel system primarily vary in two ways. To begin, they oppose on the sum of simple vowels. As an example, Mackenzie (1961) and Fattah (2010) classify nine vowels, while Amin (1979) categorizes eight and Mahwi (2008) classifies six simple vowels. While (McCarus (1958), (1997), Ahmad (1986) and Fattah (1997) do not cover diphthongs in the CK vowel list. However, Mackenzie (1962) and Aziz (1976) include the diphthongs in the vowel inventory of CK. Due to the irrelevance of diphthongs to the current study, no further details will be given. Hamid (2015) argues that there are five vowels in CK, he bases his argument on the outcome of a study he has conducted on the prosodic phonology. He further discusses that CK vowels are not contrastive in terms of length.

Vowel length in the phonology of Central Kurdish is not quite agreed upon. Other Kurdish scholars, including Ahmad (1986) and McCarus (1997), claim that vowel length is a phonologically significant feature. Whereas, scholars as McCarus (1958), Amin (1979), and Mahwi (2008), do not believe vowel length is phonemically distinctive. While Mackenzie (1961) suggests that length might be the distinguishing feature among *â* and *a*, he contends that both have qualities that are alike which is, 'open, front central'. Mahwi (2008, P.184) questions whether vowel length can be predicted based on syllable construction and stress location. Thus, long vowels appear in open stressed syllables and if they are trailed by a voiced consonant and short vowels take place somewhere else, then they appear in closed stressed syllables. Hence, vowel length is not phonologically contrastive in CK. Haig and Öpengin (2015) provide a comparable explanation of vowel length in Kurmanji. They claim that Kurmanji consists of five long vowels /i, e, a, u, o/ and three short vowels /æ, ʊ, ɨ/; though, length is not phonemically contrastive.

Based on the literature, CK high and mid vowels have length contrasts, but the variations are not contrastive. A class of phonetically similar long and short vowel phones appear to

have complementary distribution. The phonetics of the vowels reveals that all vowels (long and short) have nearly identical lengths in similar situations. Long vowels are found in open stressed syllables or stressed syllables closed with single sonorants. It should be acknowledged that lengthening stressed vowels has no effect on the vowel's quality or syllable type. In contrast, the comparatively short vowel variants are observed in closed syllables with simple coda obstruent or detailed coda clusters. The vowels in unstressed syllables are slightly shorter (but do not necessitate vowel reduction) than the vowels of stressed syllables irrespective of the existence or feature of the consonants in the coda (Hamid, 2015).

As Hamid (2015, P. 30) states the relation between long and short vowels is not straightforward, there are three phenomena that complicate the length relation of vowels. First, there is at least one minimal pair and some near minimal pairs for the short and long high back rounded vowel /u/ as shown below.

kur 'boy' vs ku:r 'hunchback'
guł 'flower' vs qu:ł 'deep'
kul 'blunt' va lu:l 'coil'

Indicating the list of words above in which the phones are in parallel distribution is an instance of the failure of allophonic rules. This has induced some linguists to regard the short and long vowels as different phonemes in the language. As Lass (1984, P.36) states, whenever synchronic description is not self-contained enough to account for failure of allophonic rules, the abnormal phenomena can be regarded as the debris left behind the historical change.

Segments normally unite themselves into phonetically definable classes. Vowels are distinguished by modifying the oral cavity through moving the tongue, jaw and the lips. Two of the CK vowels, /u/ and /o/, are pronounced with lip rounding but roundness is not a contrastive feature in CK vowels. Nevertheless, the phonetic degree of rounding of vowels can differ significantly, there is maximum a two-way phonological distinction. Thus, all the other vowels can be regarded as [-round].

As for quality, CK vowels are contrastive along the parameters of height and backness of the tongue in the oral cavity intersected by lip rounding and length. Vowels are classified according to tongue height into relations of gradual opposition. That is, they are distinguished by three distinct height gradations: high, mid, and low. The vowels are classifies as: High vowels /i,u/, /mid vowels /e,o/ low vowels /a,ɑ/. The conflict among high-mid vowels are in height only while the mid and low vowels have distinct distribution along the primary axes of height and backness. As for the horizontal axis, the high and mid front vowels contrast with their mirror image in the back, whereas the two low vowels rest in the central area; one of them /ɑ/ in the area between center and back and the other /a/ in the central area which is higher than the back vowel.

According to Hamid (2015), Vowels have allophonic variants in different contexts. /a/, for example, is assumed higher and in a more fronted position when followed by glides. It is particularly very front when it is followed by the palatal glide as in: *nạ j, 'flute', khạ j* 'when'. In unmarked context, the accurate area of this vowel in the vowel quadrilateral is very close to the centralized cardinal vowel /ɐ/, but succeeding the tradition of numerous linguists, the symbol /a/ is used to signify a low central unrounded vowel. This centralized vowel is the only lax vowel among the CK vowels.

Due to irregularity of vowel quality reported in literature and the lack of an accurate description of the CK vowels, an acoustic study has been conducted by Hamid 2015, to locate the exact position of the vowels. The phonetic description gives a more accurate account of the vowel features. Nonetheless, it should be recalled that the phonetic description of the vowels depends primarily on the abstract phonemes of CK accent are recorded reading a word list of 15 tokens for each vowel. After measuring and plotting the vowels Hamid (2015) has yield the results that is described below.

Consequently, CK has a 5 quality system, which has high–mid and front–back opposition for high and mid vowels, whereas the low vowels are central and contrasts in length. There are phonological, rather than phonetic reasons, for regarding the low vowels as having similar quality. CK vowels make three distinctions in the height of the vowels (high, mid, low) and three distinctions in the frontness of the vowels (front, central and back). Furthermore, Hamid (2015) states that the asymmetrical vowel inventory in CK is consistent with Crother's typology of world's languages. The 5-quality vowel system, according to Crother's (1978) typology of vowels, is the commonest vowel system and it is coherent with his account of 5-vowel systems where the vowels contrast in two heights in front and back with a low central vowel contrasting in length with a similar vowel.

To summarize, RP English vowels consist of 12 vowels and they are phonemically distinctive i.e. they have short and long vowels. While the number of vowels in Kurdish are not quite agreed upon by scholars neither agreed about in terms of length. However, this study agrees on that Kurdish vowels consist of 5 vowels that are phonemically not distinctive.

B. Method

Speech perception tests can provide information about the acoustic characteristics of speech sounds that are essential for listeners' discrimination of phonological categories. It is therefore necessary to distinguish L2 phonemic vowel length when the length in the learners' L1 is not phonemic. These assessments could also be used to make comparisons between two listeners when they are exposed to an identical speech sounds. This section discusses in detail how a quantitative approach was conducted. It begins by presenting the background and characteristics of the L2 participants, as well as the reasons they were selected as subjects. It also considers the stimuli, test design, and procedure for the testing task used in the study. Eventually, it introduces the method of data analysis used.

1) Participants

Thirty Kurdish native speakers (19 females and 11 males) from the University of Sulaimani, English Department, stage one, took part in the study. They ranged in age from 18 to 19, with a mean of 18.7. All of the respondents are from The Kurdistan Region of Iraq and are classified as foreign language learners. The participants had prior knowledge of basic phonetics. They had learned about vowels and consonants, as

well as basic pronunciation rules such as the various pronunciations the 'ed' ending of simple past tense of regular verbs has. They have also studied word transcribing. The subjects have no prior knowledge of phonology. All participants began learning English in a formal classroom setting in The Kurdistan Region of Iraq between the ages of 5 and 6 years old, and had been doing so for an overall mean of 13 years at the time of test execution. According to the subjects, they had never resided in a foreign country where English is spoken as a first language. None of the participants claimed to have a hearing impairment. The reason behind choosing first stage students is due to their lack of knowledge about vowels and phonology hence the lack of conscious acknowledgement of vowel length, which makes the subjects the best candidate for this research. Had they been aware of the vowel length difference in formal phonology class, they would choose more cautiously.

2) Stimuli

The AX task was used to assess students and it gives them two options. To avoid methods that focus solely on categorizing, a task that minimizes the load on auditory memory is required. AX (same–different) discrimination may well be one such task. The subjects must determine if the two stimuli in a test are the same or different in an AX discrimination experiment. The subjects are given a stimulus response sheet on which to document their answers. They must react promptly to each stimulus and assume if they are unsure how to respond rather than skipping an answer. A female adult native speaker of English was present to read out the sound stimuli which are minimal pairs prepare for the test. The test consisted of minimal pairs that differ in vowel length. The speaker was told to read a word list of sound stimuli to elicit the perception of 10 British English vowels / ɪ, ʊ, ɛ, ɒ, æ ɑ:, i:, u:, ɔ:, ɜ:/ in CVC context. The /ə/ and /ʌ/ were not included in the task, simply because /ə/ is an unstable vowel that changes according to its place in the word. For each vowel pair, there were ten words and in total of five vowel pairs there were fifty words. While /ʌ/ has no counterpart in terms of vowel quantity, i.e. it has no length contrast in Kurdish thus including it would be irrelevant to the current research.

The stimuli used in the current investigation contained real CVC words. The words used on the testing day are in a random order. There are 50 minimal pairs half of which are different in the vowel length and the other half are same words, the words that are same were used as distracters. The following paragraph will go over the elicitation, formulation, and validation of stimuli, together with the specifics of the stimuli used during the testing phases. The stimuli in the test were prepared as a list of words that are only available to the speaker and not to the subjects. The subjects were handed a sheet that contained of numbers from one to fifty. Beside each number there were two empty boxes. The subjects reacted by ticking the box under the same or different. Here, the elicitation of the stimuli took place in that when the subjects heard the words, they had to decide whether the words were the same or different, they were also asked to judge based on their initial reaction, and to tick according to their first judgment. The subjects were to assess the discrimination of phonemic contrasts in the minimal pairs. The discrimination test was a forced choice in order to simplify the task on the subjects. Prior to the actual test, a pilot test was conducted with the presence of a native male speaker to read out the minimal pairs, which were different from the actual test, to reassure the applicability of the test. Furthermore, the test was analyzed and agreed upon by three professors, hence the validity of the test.

3) Procedure

In one session, the partakers were tested in a quiet class room at the university. When all of the subjects were present in the hall, the test was conducted. Each participant sat alone until the test was completed. To prevent misunderstandings, participants read the instructions on the paper before the test began, and the researcher read out the form and process for the subject. The test is then preceded by a trial practice with stimuli that are not included in the experiment, the trail practice was done to make sure that the subjects understood the task before starting the test. The tests lasted about 15-20 minutes. Participants also completed a survey before the end of the session, which included 5 questions about demographic information and data about their language background, such as age of learning the target language, period of formal education, level of competence, everyday L1 and L2 use, and familiarity of other languages.

III. RESULTS AND DISCUSSION

A. Results

Figure 2 depicts the complete mean percentages of correct discrimination answers for each contrast. Participants outperformed chance for all contrasts (see Table 3 for one-sample t-test results versus a chance score of 50%). Though discrimination results for different contrasts differed, fluctuating from outstanding discrimination for the /æ/ and /ɑ:/ contrast (100% correct responses), three other contrasts (above 90% for /ɪ/ - /i:/, /ɛ/ - /ɜ:/, and /ɒ/ - /ɔ:/) to very good discrimination for /ɪ/ - /i:/ (97%), /ɛ/ - /ɜ:/ (90%), and /ɒ/ - /ɔ:/ (93%), and fairly poor discrimination (below 80%) for /ʊ/ - /u:/ (60%) contrast.

TABLE 3

	Test Value = 100					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Total %	-33.630	29	.000	-36.400	-38.61	-34.19

One sample T- test

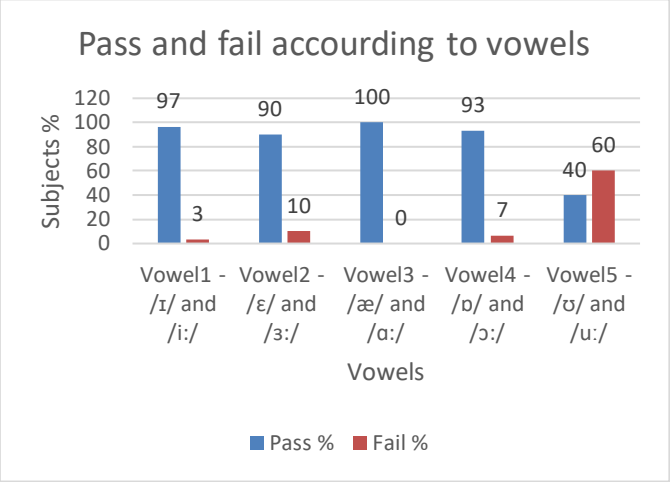

Fig. 2. percentage of vowel pairs

The overall results for students' perception of English vowels show that all the students had passed the test. However, the results for each pair of vowels are different as shown in Figure (2). The test for each pair of vowel is marked out of twenty, as it can be seen in Figure (3), the average for /æ, ɑː/ vowel pair is the highest with an average of 15 out of 20. Following it is the vowel pair /ɪ/ and /iː/ with an average of 14.3, the vowel pairs /ɛ, ɜː/ /ɒ, ɔː/ both have the same average of 12.9. Finally, the vowel pair with the lowest average is /ʊ, uː/, with an average of 8.5. The total of all five pairs of vowels are 63.6 out of one hundred. Thus, after taking the average of each vowel separately, it can be noted that the students have failed in only one pair of vowel.

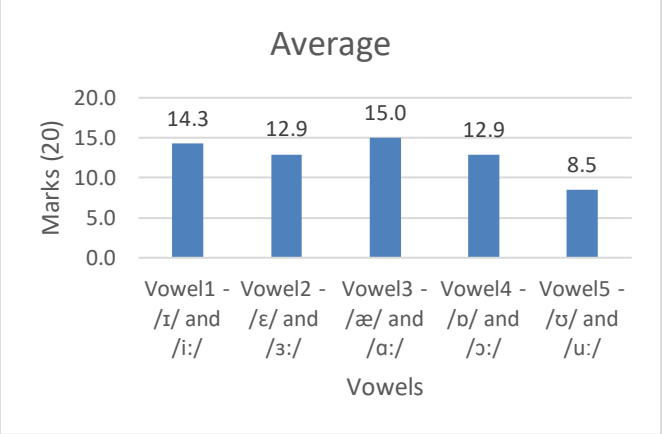

Fig. 3. the average mark of vowel pairs out of 20

Looking at Figure (4), it can be seen that the largest number of subjects had received an overall average of 65-70. The second largest number of subjects had received marks between 50-60. Furthermore, an equal number of subjects had received marks between 70-80 and 60-65.

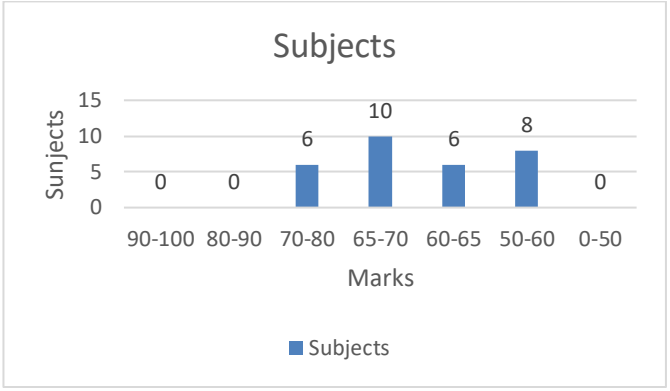

Fig. 4. subject's performance mark out of 100.

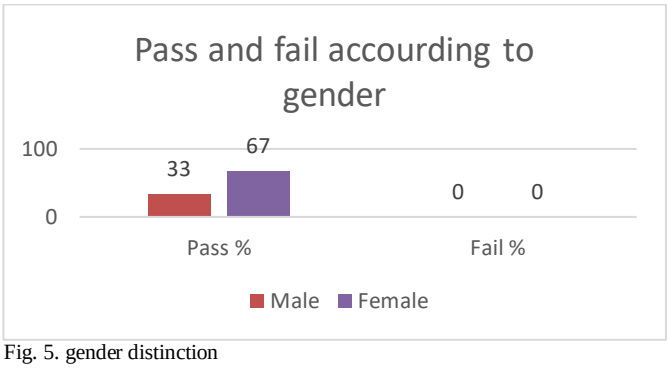

Fig. 5. gender distinction

As can be seen in Figure (5) above, females did better in the test than males. One factor for these results could be the difference in numbers between the male and female participants, since the female subject were a total of 19, while male subjects were a total of 11.

B. Discussion

This study looked at how CK English learners perceive English monophthongs. The vowels were anticipated to generate a variety of assimilation patterns, demonstrating the complexities of L2 vowel perception. After Tyler et al (2014) demonstrated that perception of non-native vowel contrasts follows the same basic tenets as perception of consonant contrasts. This study was intended to examine the specifics of vowel perception in a condition in which the L2 had nearly twofold as many contrasts as the L1. Participants were first-year university English language learners in a formal learning environment.

The current results depicted extensive inter-individual inconsistency in the assimilation patterns for non-native vowels by CK speakers. For every CK vowel, there are two English counterparts, i.e. in every vowel space of CK two English vowels are present. Thus, the results support that in terms of quality CK and English vowels are somehow similar. However, the difference between CK and English vowels are for the most part the quantity of the vowels. However, they are also different in quality. The quantity or the length of English vowels differ in that, in English there are two distinct length for each pair of vowel such as, /ɪ, iː/ and /ʊ, uː/, meanwhile in Kurdish length is not phonemically distinctive. The results showed that the interference of the native language varied from one pair of

vowel to another. One factor for this variation could be that the subjects can be considered as advanced since they have studied English for a minimum of 12 years. Therefore, they are familiar with the spelling of English words, and they have knowledge that words with a difference in length consisting of these vowels /ɪ, i:/ could actually be two different words such as their familiarity with simple words as "is" and "ease". Which explains the results obtained from the vowel contrasts /ɪ, i:/, in the results section is it shown that 97% of the subjects passed in this vowel contrast, with an average of 14.3 mark out of 20. The results of these vowels are the second highest amongst the five vowel pairs. The obtained data can be explained in terms of the quantity of vowels since English has distinctive length for each vowel while in Kurdish no such distinction is made. Thus, it was easier for the subjects to recognize the length difference henceforth, the majority of the subjects did well on this vowel pair test. This result supports Tyler and best (2007) model of PAM-L2, in that this model suggests that the success of perception of a specific non-native contrast for the L2 learner is based on its grade of resemblance or divergence with the native phones. So, the non-native vowels were dissimilar to the L1 vowels, that is why they were perceived correctly. Perception of non-native sounds is therefore related to that of native sounds. PAM-L2 assumes that "categorization" occurs once a non- native sound is perceived as present in the native language, while it is "uncategorized" if it stops to be attributed to it. Thus, when learners assimilate new L2 sounds to their phonological system, they adapt that new sound according to the auditory clues present in their L1, perceiving the new sound as an already existing one in their phonological space, rather than of generating a new category for the sound. In the case of /ɪ, i:/ vowel pair the subjects did well on the test but not excellent and this proves Best and Tyler's assimilation type of Uncategorized-Categorized assimilation (UC), which includes two L2 sounds, one assimilated to a native category and the other one uncategorized. Discrimination of contrasts is expected to be good to very good. The reason why this can be seen to fit the vowel pair /ɪ, i:/ is that it is categorized /i:/ while /ɪ/ is uncategorized.

As for the vowel pairs /ɛ, ɜ:/ and /ɒ, ɔ:/ the results are very close to each other for the average of passing the former with a 90% and the latter 93% average of passed subjects. Expectedly, when marked out of 20 they both have the same average of 12.9. These results indicate that the subjects had difficulty in differentiating between the two contrasts for both vowels since Kurdish vowels have one counterpart for the English vowel pairs mentioned above. The results for the vowel pair /ɛ, ɜ:/ can be analyzed in that the subjects had more difficulty because in Kurdish the /ɛ/ sound leans towards the middles of /ɛ, ɜ:/ sounds, even though in Kurdish we do not have /ɜ:/, some words are very close to this sound however the mentioned pair of vowel contrast tend to be perceived as /ɛ/, since /ɛ/ is a more common sound in Kurdish. This pair of vowel can be applied to PAM-l2's Category-Goodness Assimilation (CG), when two L2 sounds map onto the same category in the native sound system, but one is a better fit than the other. Discrimination is expected to be moderate to good Best and Tyler (2007). The same type of category assimilation can be applied to the vowel pair /ɒ, ɔ:/, for this vowel contrast we only have a much higher vowel in the vowel chart in Kurdish, the vowel pair contrast assimilates into the Kurdish sound /o/, that is as mentioned above has a much higher place than its English contrasts, in the vowel space. Thus, the subjects have assimilated /ɒ, ɔ:/ sounds to /o/ considering CG the / ɔ:/ is a better fit since it is a round vowel sound similar to /o/ which is a round and a closed sound. As we have mentioned in the earlier section, perception comes before production, correct perception of sounds increases the chance of correct pronunciation.

In comparison to the current study, a research conducted on production of Ilhami Kurdish speakers at the Department of English Language Teaching, Islamic Azad University, Ilam Branch, Ilam, Iran. The study shows that 90% of elementary Ilami Kurdish EFL learners pronounced /ɔ:/ as /ɒ/. E.g. the word *ball* was pronounced as [ba:l], which was the wrong choice. Only 10 percent of learners could pronounce it correctly. Also, *taught* was judged as [ta:t] in place of [to:t]. In the same study, another group of people at the advanced level were tested. Reflecting on the vowel /ɔ:/, the 70 percent of Kurdish learners pronounced /ɔ:/ properly. E.g. the word *ball* was pronounced as [bɔ:l] which was the correct choice. Thus, this study shows that elementary learners had more difficulty compared to advanced learners in the production of these vowels.

As for the vowel pair /æ/ and /ɑ:/, 100% of the subjects passed this vowel pair. This result supports PAM-L2 type one which is Two-Category Assimilation (TC), that is the listener perceives two L2 sounds as two different L1 categories. Discrimination is predicted to be excellent. Hence, supporting the results obtained in this study. This could be the case, because on the horizontal axis of CK the two low vowels rest in the central area; one of them /ɑ/ in the area between center and back and the other /a/ in the central area which is higher than the back vowel (Hamid 2015). Thus, the English vowel pair /æ/ and /ɑ:/ are perceived in terms of the CK vowels. Although, they cannot be considered as the same pair of vowel counterparts.

In contradiction to the vowels described above, for the vowel pair /ʊ/ and /uː/ 60% of the subjects failed. With an average of 8.5 out of 20 in the test. This result could be due to lack of vowel length in CK for /u/. This result could be applied to PAM - L2 type of Single-Category Assimilation (SC), when two L2 sounds are heard as the same L1 phoneme, although none of them is actually a good fit or is mainly 'better' than the other. Discrimination is predicted to be poor. The present results also support the hypothesis presented above, in which it predicted that the vowel the subjects would have the most difficulty in discriminating would be /u/. Moreover, in the same research mentioned above, the 86.66 percent of elementary learners pronounced the vowel /ʊ/ as /u:/. E.g., the word 'full'' was pronounced as [fool], which was the wrong selection. Only 13.33 percent of learners were able to pronounce it properly. While for the advanced Kurdish speakers the vowel /ʊ, u:/ was correctly pronounced by 73.33 percent of advanced EFL learners. Only 26.66 percent of all students were unable to correctly pronounce it.

The results shown above can be explained through the points that will be discussed, first, to answer the question of how do Kurdish EFL learners perceive English vowels, the results range between good, moderate, and bad perception outcomes

for the vowel contrasts. As for their good perception, it can be explained by the students' background knowledge for English words and spelling system, since they at least studied English for a period of 12 years. Therefore, they have had enough exposure to English words, and in their minds, they might have been thinking about how two sounds could actually be from two different words. Also, they are familiar with words such as 'ease' and 'is' since these words were in the test too, and as mentioned in the methodology the word choice for the test ranged from basic to advance in terms of difficulty. Thus, these subjects have thought of spelling system i.e. for each sound they have thought of the letter that is written for it. Another point is that perception of English vowels does affect production too as it can be seen from the research made on Kurdish Iranian students, it makes it more obvious that these two are correlated in the vowel contrast /ʊ/ as /u/ since in both perception and production the subject did not do well. Thus, perception is essential for correct production as suggested above.

To explain the poor performance of short /ʊ/, and long /uː/, it is crucial to look at the vowel quality. Since these two vowels have similar quality, in other words, quality did not help the learners to discriminate between the vowel pairs because their place in the vowel space is very close hence the difference in their quality is not discernible enough to be helpful, the subjects could not discriminate quantity either because CK is not contrastive length wise. Compared to the vowel pair /æ, ɑː/, since /æ, ɑː/ are different in both quantity and quality, the subjects did very well in them. This brings about the results of the vowel pair /ɪ, iː/ in which the students did well, the reason that the subjects managed to do well, even though they are also somehow similar in quality just like the vowel pair /ʊ, uː/, can be resorted to the learners' familiarity with the words.

To summarize, the current findings, like those stated by Tyler et al. (2014), discovered significant inter-individual inconsistency in non-native vowel assimilation patterns. One contrasts were primarily categorized as TC /æ, ɑː/, two contrasts were categorized as CG /ɛ, ɜː/ and /ɒ, ɔː/. The vowel contrast UC for /ɪ, iː/, and /ʊ/ and /uː/ contrasts as SC assimilation types. Moreover, the results varied between the vowel contrasts because of the difference in vowel quantity. Since CK does not make the distinction between vowel length meanwhile RP English makes the distinction of length and the results are primarily justified with this point.

CONCLUSION

This study assessed the perception of English vowels by Kurdish EFL. The study first, gave a general background on Factors influencing L2 speech acquisition. Then it portrayed L2 speech learning in an English as foreign language (EFL) context, followed by an explanation of the speech models, like SLM, PAM - L1 and PAM - L2, among others.

The study then conducted a test using AX task for discrimination of English vowels by Kurdish EFL, the results obtained from the study varied from one vowel contrast to another. The subjects, overall did well in the perception test with an average of 100% pass for all the students in all the vowels, the male percentage being 33% and females 67% since the number of the female subjects were twice as much as the males.

The vowel with the best discrimination percentile is the vowel pair /æ, ɑː/ with 100% correct choices due to its difference in both quality and quantity, since in the vowel space the two vowels are noticeably far from each other that is in terms of quality, thus they are discriminated better. Viewing its length, i.e. the vowel quantity, they are different too with one being longer than the other, thus the good discrimination. While the vowel with the worst discrimination rate is the vowel pair /ʊ, uː/ (60%) due to its almost sameness in the vowel space and its difference in length, it was harder for the subject to discriminate. The vowels /ɛ, ɜː/ (90%), /ɒ, ɔː/ (93%), and /ɪ, iː/ (97%) are in between with slightly varying rates. The results show that the length of the vowels i.e. quantity played a significant part in the results, along with the quality of the vowels. Since, for every pair of English vowels there is only one Kurdish counterpart. Apart from vowel length and vowel quality, the results could suggest the familiarity of the students with the minimal pairs in the AX task, since the students have a minimum age of 12 years of exposure of English. Furthermore, the results obtained, support the perception model presented by PAM-L2.

REFERENCES

Amin, W. O. (1979). *Aspects of the verbal construction in Kurdish*. M. Phil.

Ahmad, A. R. (1986). The phonemic system of modern standard Kurdish. PhD thesis, University of Michigan.

Best, C. T. (1993). Emergence of language-specific constraints in perception of non-native speech: A window on early phonological development. In Developmental Neurocognition: Speech and face processing in the first year of life Springer, Dordrecht. (pp. 289-304).

Best, C. T. (1994). The emergence of language-specific phonemic influences in infant speech perception. The development of speech perception, (pp.167-224).

Best, C. T. (1995). Learning to perceive the sound pattern of English. Advances in infancy research, 9, (pp. 217-217).

Best, C. T., & Tyler, M. D. (2007). Nonnative and second-language speech. Language experience in second language speech learning: In honor of James Emil Flege, (pp. 13-34).

Crothers, J. (1978) Typology and universals in vowel systems. In Universals of human language, (J. H. Greenberg, C. A. Ferguson & E. A. Moravcsik, editors). Stanford: Stanford University Press (pp. 93–152).

Cruttenden, A. (2008). Gimson's Pronunciation of English, 7th edition, London: Hodder Education.

Deterding, D. (2006). The North Wind versus a Wolf: short texts for the description and measurement of English pronunciation. Journal of the International Phonetic Association (pp. 36, 187–196).

Escudero, P. (2005). Linguistic perception and second language acquisition: Explaining the attainment of optimal phonological categorization. Netherlands Graduate School of Linguistics.

Escudero, P. (2009). Linguistic perception of "similar" L2 sounds. Berlin: Mouton de Gruyter, (pp. 151-190).

Flege, J. E. (1995). Second language speech learning: Theory, findings, and problems. Speech perception and linguistic experience: Issues in cross-language research, (pp. 92, 233-277).

Hawkins, S. & Midgley, J. (2005). Formant frequencies of RP monophthongs in four age groups of speakers. Journal of the International Phonetic Association, (pp. 35, 183–200).

Harrington, J. (2010). Acoustic phonetics. In: The Handbook of Phonetic Sciences, 2nd edition, W.J. Hardcastle, J. Laver, and F. Gibbon (eds.), Malden, MA: Wiley-Blackwell, (pp. 81–129)

Haig, G. and Ergin Ö. (2015). Kurmanji Kurdish in Turkey: structure, varieties and status. Unpublished poster presentation at: Linguistic Minorities in Turkey and Turkic speaking minorities of the peripheries, November 2015, Weisbaden, Germany.

Hamid, T. (2015). The prosodic phonology of central Kurdish. PhD thesis, Newcastle University.

Jakobson, R., Fant, G. and Halle, Morris (1952). Preliminaries to speech analysis. Cambridge: MIT Press.

McCarus, Ernest N. (1958). A Kurdish Grammar: Descriptive Analysis of the Kurdish of Sulaimaniya, Iraq. New York: American Council of Learned Societies.

Mackenzie, D. N. (1961). Kurdish Dialect Studies I. London: Oxford University Press.

Mackenzie, D. N. (1962). Kurdish Dialect Studies II. London: Oxford University Press.

Maddieson, I., & Disner, S. F. (1984). Patterns of sounds. Cambridge University Press.

McCarus, E. N. (1997). Kurdish Phonology. In: Alan S. Kaye, ed. Phonologies of Asia and Africa: Including the Caucasus Vol. 1. Indiana: Eisenbrauns. (pp. 691-706).

Mahwi, M. (2008). fônatîk u fônôlôžî: fônatik. Slemani: University of Sulaimani.

Mirzaei, K., Gowhary, H., Azizifar, A., & Esmaeili, Z. (2015). Comparing the phonological performance of Kurdish and Persian EFL learners in pronunciation of English vowels. Procedia-Social and Behavioral Sciences, (pp. 199, 387-393).

Lass, R. (1984). Phonology: An Introduction to basic concepts. Cambridge: Cambridge University Press.

Peterson, G. E., & Lehiste, I. (1960). Duration of syllable nuclei in English. The Journal of the Acoustical Society of America, (pp. 32, 693-703).

Roach, P. (2009). English Phonetics and Phonology: A Practical Course, 4th edition, Cambridge: Cambridge University Press.

Stevens, K. N., & House, A. S. (1955). Development of a quantitative description of vowel articulation. Journal of the Acoustical Society of America, (pp.27, 484–493).

Tyler, M. D., Best, C. T., Faber, A., & Levitt, A. G. (2014). Perceptual assimilation and discrimination of non-native vowel contrasts. Phonetica, (pp. 71, 4-21).