Vowel Shortening In English As Recognized By Iraqi EFL Learners

AT The University Level : A Perceptual Study *

By

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Abstract

The present research investigates the ability of EFL Iraqi learners at the University level in recognizing vowel shortening in English . It consists of three parts : The theoretical part , the experimental part , and conclusion . The theoretical part discusses some basic features of English vowel sounds , vowel versus consonants , the anatomy of a vowel , pure vowels and their articulatory , auditory and acoustic features . It also displays definitions and cases of English vowel shortening . The practical part is devoted to describe the test conducted by the researcher as well as showing the results of the subjects' performance in the test . It introduces the objectives of the test , some basic details about the stimuli , subjects , CD – tape recording , the answer sheet , and the procedures . The last part presents the conclusions based on the main results of the test . The research terminates with references and an appendix .

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1. Preliminaries

1.1. Introduction

Perception is a process of hearing and of recognition of units of sound complex. It results from the transmission of auditory information to the brain . This information is extracted from the sound complex and interpreted by the hearer with two types of references : first , reference to stored patterns developed

during previous experience with sound units , and second , reference to the articulation patterns which the hearer himself uses when he is acting as a speaker Brosnahan and Malmberg (1970 : 39).

This means that a listener tends to interpret sounds heard in terms of his own speech , i.e. in terms of his own motor patterns (Liberman et al , 1963 : 53) . And as far as the vowel sounds are concerned , a listener utilizes whatever knowledge he has to recognize the shortened vowels in terms of the way in which their acoustic structure fits into the patterns of sounds that he is able to observe . The present study is concerned with sound perception and recognition of English vowel shortening as recognized by Iraqi learners . It investigates the ability of a sample of Iraqi learners of English at the university level to recognize vowel shortening and it examines the importance of duration as an acoustic cue to recognize the shortened / reduced vowels .

1.2. The Problem of the Study

Iraqi learners of English are usually taught how English vowels are produced . However there is no direct and detailed reference in their academic process to the vowel shortening except for the very short reference to fortis and lenis consonants . Thus , vowel shortening process may cause a problem to Iraqi learners of English .

1.3. The Objectives of the Study

This study principally aims at achieving the following objectives :

1-   Examining the ability of the subjects in recognizing English vowel shortening in single word pairs .

2-   Testing experimentally the plausibility of the hypotheses stated in the following section

3-   Showing whether gender or the sex factor has any influence on the subjects' performance .

4-   Presenting recommendations based on the final results to overcome those difficulties encountered by the learners .

1.4.   The Hypotheses of the Study

The present study is based on the following hypotheses :

1- Iraqi EFL learners at the university level can easily recognize English shortened vowels .

2- Iraqi EFL learners at the university level can easily recognize the shortened long vowels more than the shortened short vowels .

3- Iraqi EFL female learners can recognize English shortened vowels better than the male subjects .

1.5. The Limits of the Study

The present study is limited to the investigation of Iraqi EFL learners' ability in recognizing vowel shortening in isolated words . The representative sample was chosen from second year students at the Department of English , The College of Education for Humanities , Basra University of the academic year 2013-2014 . Those learners had already taken a full year course in English phonetics in their first academic year during which they had studied vowel shortening .

2. The theoretical part

2.1. Vowels Versus Consonants

McMahon (2002:68) shows that vowels and consonants are all speech sounds and they are produced by using the same pulmonic egressive airstream. Tatham and Morton (2011:26) define pulmonic egressive airstream as the flow of air that is created in the lungs and passed through the larynx towards the oral or the nasal cavity and at the end to the outside world.

Forming any sound , is subjected to several modifications of a moving airflow , carried out by the actions of the vocal folds and the articulatory organs (McMahon , 2002:68) . The articulatory organs are the pharynx , the velum, the alveolar-ridge , the teeth , the tongue ,and the lips (Roach , 2009 : 9-10). Katampa (1989:2-3) notes that all speech sounds are formed with the air passing from the lungs to the larynx . In the larynx , the air passes through the vocal folds . Ladefoged and Johnson (2010: 149-150) explain that if the vocal folds are open and there is little or no airflow passing between them, there is no vibration and the produced sound is a voiceless sound. But if the vocal folds are open and there is a great airflow as in the production of the h-sound , the vocal

folds will vibrate while they are open .The produced sound is called a breathy voice or murmur . A breathy sound occurs in English in the pronunciation of / **h** / in between two vowels as in *ah**ead*/ əhed / , and *be**h**ind* /bɪhaɪnd/. But if the vocal folds are closed together , the air forces them apart in order to cause vibration . These sounds are called voiced sounds . All vowels are voiced . Some consonants are voiced and the others are voiceless.

The organs of speech are able to utter two main types of sounds . Some sounds are called vowels and the others are called consonants   (Jones , 1969: 12). The distinction between vowels and consonants depends on the quantity of closure provided to the air-stream when it passes through the mouth (Brook and Deutsch, 1957:62). Phonetically speaking , Roach (2009:10) points out that vowel sounds are those sounds which cause no closure to the air-stream when it passes through the larynx . Crystal (2008:517) defines vowels as sounds that are produced without an obstruction which causes an audible friction , the air goes out over the center of the tongue. Gimson (1970: 28) illustrates that vowels are not accompanied by any narrowing through the speech tract which can prevent the air-stream to cause audible plosion . Consonants , on the other hand , are sounds which are produced by obstructing the flow of air through the vocal tract (katampa , 1989:4) . Deutsch and brook (1957:62) show that a consonant is a sound which is produced with a complete or a partial obstruction to the air-stream of such a type in order to cause audible plosion . A consonant is defined by Crystal (2008:103) as a sound that is made by a narrowing in the airstream so that the air is either completely blocked or partially to cause friction . Phonologically , a vowel is the nucleus or the main part of the syllable whereas a consonant occupies the marginal part (Abercrombie, 1967: 39) . Since the present study is concerned with vowels rather than consonants ; therefore consonants description and classification are not presented any further in this work .

Throughout the production of vowel sounds , the tongue is convex to the roof of the mouth causing no friction or obstruction (Jones , 1969 :   12) . McMahon (2002: 68) also notes that throughout their production , the vocal folds are vibrating and the velum is raised .That is why all vowels are voiced and oral . Vowels are more difficult to describe than consonants because there is no narrowing in the vocal tract when they are produced (Katampa , 1989 : 8). Ladefoged and Johnson (2010 : 87) mention another problem or reason which is that :

> " There are no distinct boundaries between one type of vowel and another . When talking about consonants the categories are much more distinct . A sound may be a stop or a fricative or a sequence of the two . But it can not be halfway between a stop or a fricative . Vowels are

different . It is perfectly possible to make a vowel that is halfway between a high and a mid vowel ".

There are three features that are necessary in the description of vowels . These features or dimensions are :

(1) The tongue height

(2) Which part of the tongue is raised

(3) Lip rounding

Section (2.2) deals with these dimensions in detail .

2.2. The Anatomy of a vowel

McMahon (2002 : 69-72) explains that it is necessary to know three major features to describe vowels accurately . As stated previously , these features are tongue height , frontness vs. backness and lip rounding . They are different from the parameters of consonants . Roach (2009 , 15-19) states that English has twelve pure or (simple) vowels , eight diphthongs , and five triphthongs .They are mentioned below :

1- Pure vowels are /ɪ , iː , e , æ ,ɑː , ɒ, ɔː ,ʌ , ə, ɜː , ʊ ,uː /

2- Diphthongs are /eɪ, aɪ , ɔɪ , əʊ, aʊ , ɪə , eə,ʊə /

3- Triphthongs are /eɪə ,aɪə, ɔɪə, əʊə ,aʊə/

 The present study is concerned with the shortening of only the English pure vowels . The English diphthongs and triphthongs are not dealt with .

2.2.1. The High-Low Dimension

Burleigh and Shandera (2005 : 32) refer to this dimension as the distance between the tongue surface and the palate . Through this dimension , vowels are classified into close , mid and open vowels . Close vowels can be defined as vowels which are produced when the tongue is raised towards the roof of the mouth . The tongue is close to the palate . Close vowels are / ɪ , iː , ʊ , uː / . If the tongue is not raised at all , but it is lowered from its normal position . This means that the tongue is in its relaxed and resting position for speech. The produced vowels are called open vowels. Open vowels are /æ/and /ɑː/ . Mid vowels are   intermediate sets between close and open vowels .The tongue is between the positions half-open and half-close . /e / , /ɔː / , /ʌ / , /ə / , and /ɜː/ are mid vowels (Rugg and Cleghorn , 2011 : 350)

2.2.2. The Front-Back Dimension

This dimension refers to which part of the tongue is raised the highest   or or lowered to the lowest position (Shandera and Burleigh , 2005 : 32) . The parts of the tongue are front ,   back , and centre . Front vowels are sounds in which the front part of the tongue is raised towards the roof of the mouth (the hard palate) during their production . English front vowels are

/ i: / as in fl**ee**ce   / fli:s /

/ ɪ / as in k**i**t   / kɪt /

/ e / as in dr**e**ss   / dres /

/ æ / as in tr**a**p /træp /

Back vowels are sounds which are produced when the back of the tongue is raised towards the soft palate or velum or lowered to the lowest position throughout their production . The back vowels are

/   u:/ as in g**oo**se   / gu:s /

/ ʊ / as in f**oo**t   /fʊt /

/ ɒ / as in l**o**t   / lɒt /

/ ɔ:/ as in th**ough**t / θɔ:t /

/ ɑ: / as in p**al**m / pɑ:m /

Central vowels are sounds which are produced by raising the central part of the tongue towards the roof of the mouth .Central vowels are / ə/ as in **a**bout   / əbaʊt/ , / ɜ:/ as in n**ur**se / nɜ:s/ , and /ʌ /as in tr**u**st / trʌst /   (McMahon , 2002 : 70-71) .

2.2.3. Lip Rounding

 The lips can have many different shapes . They are stated below :

1-   Rounded , where the lips are protruded forward . This is clearly seen in the production of the vowels /ɒ ,ʊ , ɔ: ,u: / .

2- Spread , where the lips are away from each other . This is clearly shown in the articulation of / i:/

3- Neutral , where the lips are in the normal position or shape . This is seen in the production of / ə , ʌ , e / (Roach , 2009:13) .

Katampa (1989 : 11) illustrates the previous dimensions by means of the following diagram.
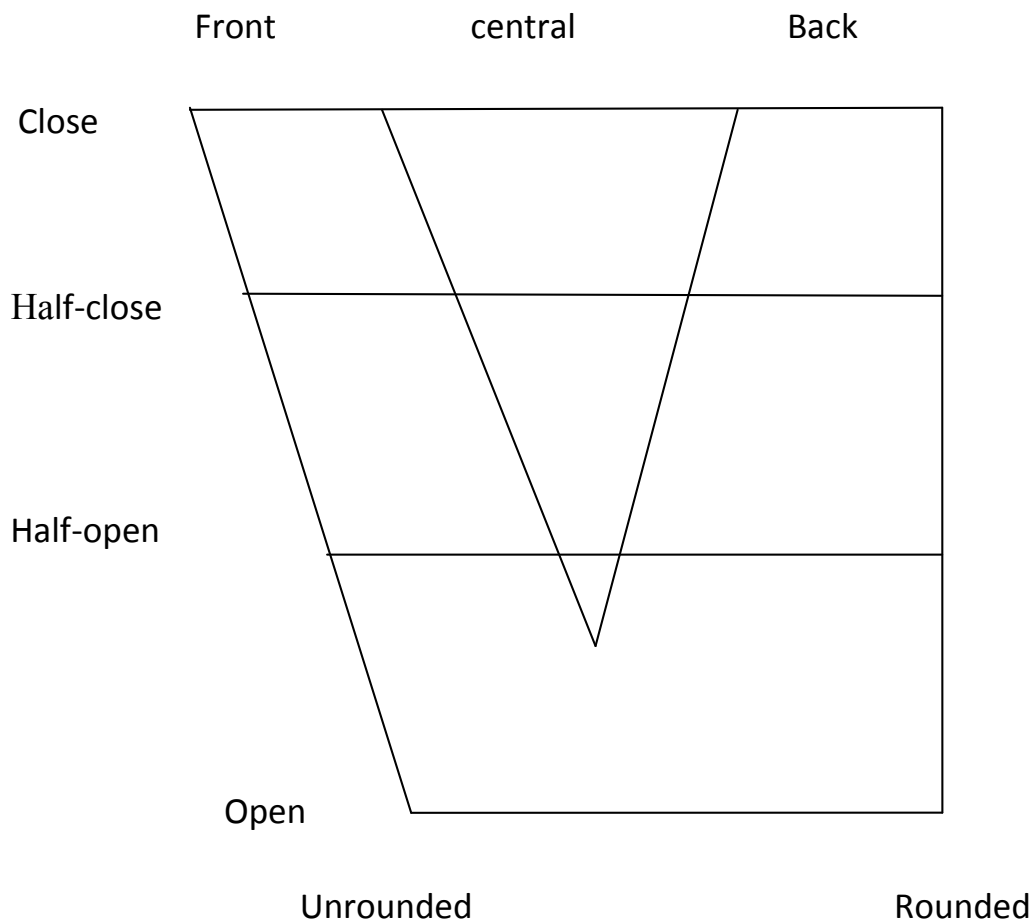
Front   central   Back

Close

Half-close

Half-open

Open

Unrounded   Rounded

Figure (1) : Tongue Articulatory Dimensions (Katampa , 1989 :11)

2.3. The English Pure Vowels

2.3.1. Definitions

   Throughout the production of a pure vowel , the organs of speech remain motionless for a remarkable period of time. Vowels which have a consistent unchanging quality are called pure vowels (Giegerich , 1992 :17) . McMahon (2000 : 73) defines a pure vowel as a vowel whose quality remains constant from the beginning of its production to the end . A pure vowel is " a vowel which remains constant and does not glide " (Roach , 2009 : 17) . In addition , Crystal (2008 : 397) illustrates that a pure vowel is a sound with no change in quality through the syllable . A pure vowel is also known as simple or

monophthong . Anyanwu(2008 : 48) notes that a pure vowel is a single vowel in which the articulators do not change their position.

2.3.2 . The Articulatory Features

English pure vowels are classified into short and long vowels . / i , e ,æ , ʌ , ɒ , ʊ , ə/ are considered as the ' short ' vowels ; whereas / i: , ɑ: , ɔ: , u: , ɜ : / are considered as the ' long ' vowels . The long vowels tend to be longer than the short vowels and length is represented in more phonetic relations not in all relations by two dots (:) (Roach , 2009 : 16) . The following pairs of words show the difference between long and short vowels .

h**i**d   /hɪd /   **hee**d   /hi:d /   / ɪ - i: /

h**a**d / hæd /   **ha**r**d** / hɑ:d /   / æ - ɑ: /

cod   / kɒd /   **cor**d / kɔ:d/   / ɒ - ɔ: /

p**u**t / pʊt /   **boo**t / bu:t /   / ʊ - u: /

b**u**t / bət /   b**ur**t   / bɜ:t /   / ə - ɜ : /

The short vowels are seven in number . They can be described as follows

(Gimson , 1970 :151-153)

1-   Vowel / ɪ /

Description :   This vowel is produced with the front part of the tongue being raised just above the half-close position . The lips are slightly spread . The quality is similar to that of cardinal vowel no.2 [e]. The tongue is lax because there is a light contact between the tongue and the upper molars.

Examples : s**i**t / sɪt/ , rh**y**thm / rɪðm̩ / , hous**es** /haʊzɪz /, v**i**ll**a**ge / vɪlɪdʒ /

2-   Vowel / e /

Description : This vowel is produced when the front part of the tongue is raised between the positions half-close and half-open. The lips are neutral . The quality of this vowel lies between cardinal vowel no.2 [e] and cardinal vowel no.3 [ɛ] . The tongue is lax .

 Examples :   s**e**t / set/ , d**ea**d /ded / , m**a**ny /meni / , w**e**nt/ went /

3-   Vowel /æ /

Description : The front of the tongue is raised just below the half-open position. The lips are neutrally open . The quality of this vowel is nearer to cardinal vowel no.3 [ɛ] . The tongue is lax .

 Examples : r*a*sh / ræʃ/ , pl*ai*t / plæt / , b*a*ck / bæk /, pl*ai*d / plæd /

4-   Vowel   / ʌ   /

Description : For this vowel the centre of the tongue is raised just above the open position . The lips are neutrally open . The quality of this vowel is that of cardinal vowel no.4 [a] .The tongue is lax .

 Examples :s*u*n /sʌn /, c*o*me / kʌm /, s*o*n / sʌn / , bl*oo*d / blʌd /

5-   Vowel   / ɒ /

Description : This vowel is articulated with the back part of the tongue . The back of the tongue is in the open position . The lips are rounded . The quality of this vowel is that of cardinal vowel no.5 [ɑ] . The tongue is lax .

 Examples : d*o*g / dɒg / , w*a*tch/ wɒtʃ / , c*ou*gh / kɒf / , kn*ow*ledge /nɒlɪdʒ /

6-   Vowel   / ʊ /

Description :For this vowel , the back of the tongue is raised just above the half-close position . The lips are closely rounded . The quality of this vowel is that of cardinal vowel no.7 [o] . The tongue is lax .

 Examples : p*u*t / pʊt / , s*u*gar /ʃʊgə / , w*o*lf /wʊlf / , g*oo*d / gʊd /

7-   Vowel   / ə /

Description : For this vowel , the centre of the tongue is raised between half-open and half-close positions . The lips are neutral . The tongue is lax

 Examples :*a*bout /əbaʊt / , gentlem*a*n /dʒentlmən / , moth*er* / mʌðə /, fam*ou*s / feɪməs /

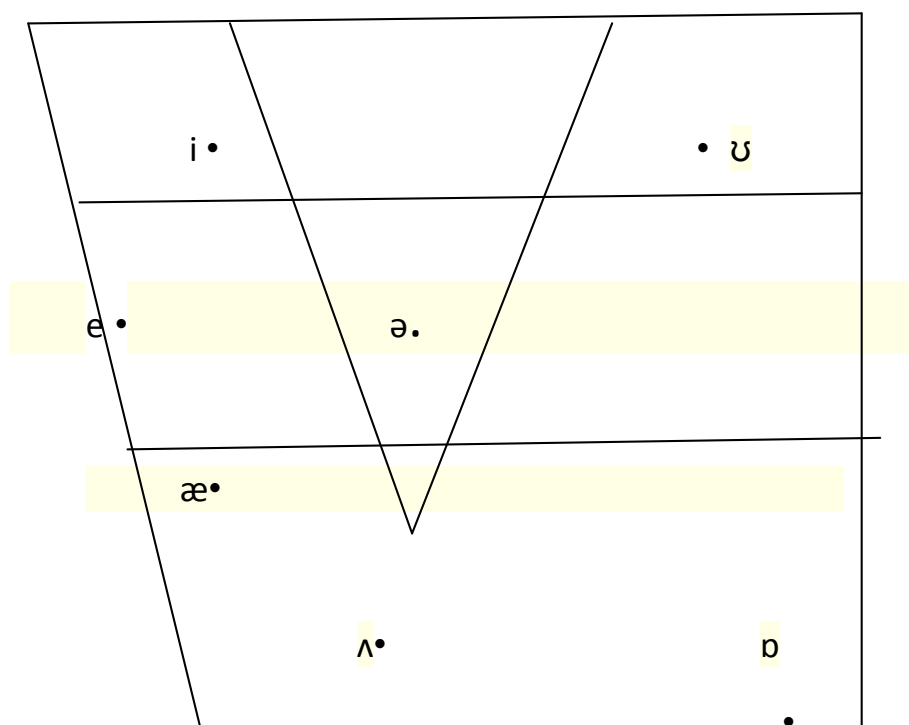The following diagram shows the position of the English short vowels .

Figure (2) :The Positions of the English Short Vowels (Gimson ,1970: 154)

The long vowels are five in number . They can be described as follows
(Gimson , 1970 : 154 -155)

1-   Vowel   / i: /

Description : This vowel is articulated when the front of the tongue is raised
just below the close position . The lips are spread . The quality of this vowel is
nearer to cardinal vowel no.1 [i] . The tongue is tense because there is a firm
contact between the tongue and the upper molars .

Examples : tr*ee* / tri: / , b*e*/ bi:/ , p*ie*ce /pi:s / , k*ey* / ki: /   , pol*i*ce / pəli:s /

2-   Vowel   / ɑ: /

Description : The back of the tongue is in the fully open position . The lips are
open . The quality is nearer to cardinal vowel no. 5   [ɑ].The tongue is lax .
Examples : p*ass* /pɑ:s / , p*ar*t /pɑ:t / , h*ear*t / hɑ:t / , cl*er*k /klɑ:k /

3-   Vowel   / ɔ:/

Description :The back of the tongue is raised between the half-open and half-close positions . The lips are rounded . The quality is that of cardinal vowel no.6 [ɔ] . The tongue is lax .

 Examples : c*or*d / kɔ:d/, ***ough***t / ɔ:t / , t*al*k / tɔ:k/ , d***oor*** /d ɔ: /

4-   Vowel   / u:/

Description : This vowel is produced when the back of the tongue is in the close position .The lips are closely rounded . The quality is that of cardinal vowel no.8 [u] . The tongue is tense .

Examples : f*oo*d / fu:d / , gr*ou*p / gru:p / , r*u*de / ru:d / , bl*ue* / blu:/

5-   Vowel   / ɜ : /

Description : The centre of the tongue is raised between the half-close and the half-open positions . The lips are neutral . The quality of this vowel is remote from all cardinal vowels. The tongue is lax .

Examples : b**ir**d / bɜ:d / , s**er**ve / sɜ:v / , n**ur**se / nɜ:s / , w**or**k / wɜ:k / , j**our**ney /dʒɜ:ni /

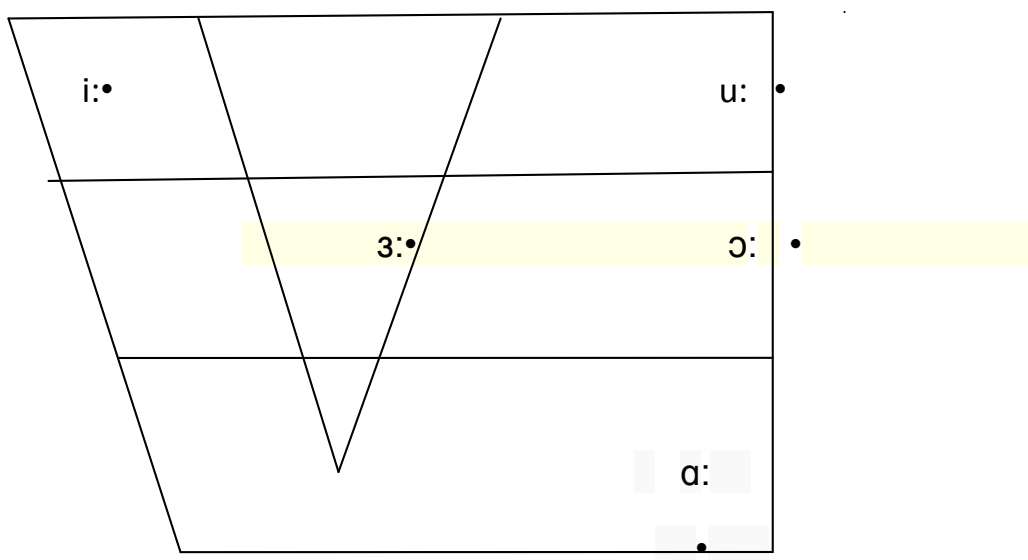The following diagram shows the positions of the English long vowels

Figure (3) : The Positions of the English Long Vowels . (Gimson , 1970 :155)

2.3.3. The Acoustic Features

According to Ladefoged (2001 :31) the most important features in describing the acoustic properties of vowel sounds are quality , frequency , intensity , and formants . Regarding formant , Fry (1976 : 71) defines it as " a normal mode of vibration of the vocal tract ." and formant frequency as " the frequency of the normal mode of vibration ".The quality of a vowel is the factor that distinguishes one vowel from another . It depends on variations within each cycle of the sound wave . It depends on the formants . Frequency is a technical term for an acoustic property of a sound . It refers to the number of complete cycles of variations in air pressure in a second . Frequency is the number of complete opening and closing movements that the vocal folds make in a second. Crystal (2008 : 198) points out that frequency is the number of occurrences of the sound wave in a second .

Ball and Lowry (2001 : 64) note that intensity refers to the amount of energy that is required to produce a sound . It is related to the size of the variations of pressure . The intensity of a sound is the amount of energy that is transmitted through the air at a particular point (Ŏconnor , 1973 : 81)

Johnson (2003 : 113) shows that vowel height is related to F1 frequency , i.e. high vowels have a low F1 and low vowels have a high F1 . On the other hand , vowel frontness is related to F2 , i.e. front vowels have a high F2 and back vowels have a low F2 . Formant 3 has a little function in distinguishing vowels. It is related to the shape of the lips. The frequency of this formant is very high and is influenced by the shapes 'of the lips (Ladefoged : 2001 : 46) . As for amplitude , it is" the extent of the maximum variation in air pressure from normal during the production of any speech sound at any given time ." (Awaness , 1976 :18) . Birjandi and Nodonshan (2005 : 156-157) contend that the highest distance of vibration in the air pressure that travels from the lowest point to the highest point is the amplitude of a vowel . See figure (4)
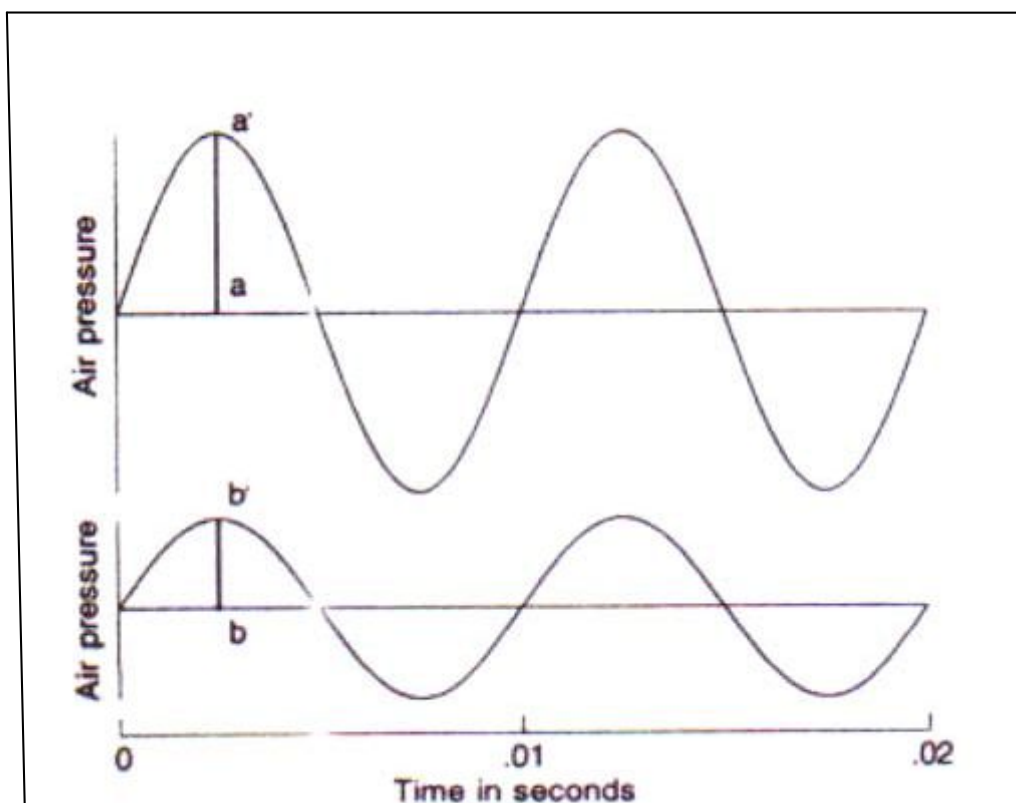
2.3.4. The Auditory Features

There are four major auditory or perceptual features of English pure vowels. These features are quality , pitch , loudness , and length .

2.3.4.1. Quality

Human beings differ from one another physically and physiologically as well . Heffner (1950: 52) states that differences in vowel quality are related to differences in the higher harmonics or overtones which are the integral multiples of the lowest harmonic which is called the fundamental frequency . Wright (1996) as cited in Heyes et al. (2004 :41) states that vowels are distinguishable from one another due to the resonances of the vocal tract . This means that vowels are distinguished according to the fundamental frequency and the formant values of that fundamental . The hearers' perception of the quality of a sound depends on the way in which the speaker's vibrators and resonators function together (Gimson , 1970 : 18) . Mateesuc (2003 : 74) gives a complete description of the articulatory nature which influences the quality of the resulting vowel . He argues that the tongue position and the activity of the lips modify the shape of the resonating cavities above the larynx .

2.3.4.2. pitch

The pitch of a particular sound is related to the vibration of the vocal folds , that is the opening and closing of the vocal folds which make variations in air pressure in the waveform (Ladefoged , 2001 :161) . Roach (2009 : 120) illustrates that the term pitch is used to refer to the perceptual sensation experienced by a listener . It depends on the frequency of the vocal folds vibration , namely formants . Accordingly , the higher the formant the higher the perception of pitch (Ladefoged , 2001: 162) . Oconnor(1973 : 100) shows that the range of the pitch level of a males' voice is about 150 cps. , whereas that of a females' voice is 240 cps .

2.3.4.3. Loudness

Vowels are more powerful (louder) than consonants (Gimson , 1970 : 24) . Loudness is defined by Crystal (2008:290) as an auditory feature that corresponds to the acoustic property (intensity) which is the feature that is related to the amount of energy required to produce a sound . Just as frequency is the acoustic correlate of pitch , intensity is the appropriate correlate of how loudly we perceive a sound . This means that the greater the intensity , the louder the sound we perceive (Ladefoged , 2001:161) . Loudness depends on the degree of force with which the airflow is expelled out from the lungs through the pulmonic air-stream mechanism while there is vibration in the vocal folds. Therefore , the greater the force the greater the resulting loudness (Abercrombie , 1967:95) . Crystal (2008:290) mentions a factor that affects our sensation of loudness whereby increasing the frequency of vocal-folds vibrations may make one sound seem louder than another . Some English vowels appear to be louder than others , e.g. the vowel in ' hard ' / hɑːd/ has more power than that in the word ' heed ' / hiːd / . This is because open vowels have a greater energy than close ones .

2.3.4.4. Length

Sounds may appear to listeners of different lengths or durations . The term *length* is used to refer to a subjective perception of how long a sound lasts (Roach , 2009 : 16) . The term *length* refers to the phonological correlate of durational differences between sounds , tied to the phonological concept *quantity*. Short vowels are those which are supposed to require muscular tension on the part of the tongue . On the other hand , Long vowels are those in which the tongue is supposed to be held loosely . (Jones , 1957 :39)

Ladefoged and Disner (2012:71) show that length of a vowel depends on several factors : first , each vowel has its natural length , for example , / iː / as in ˈ heed ˈ / hiːd/ is longer than / ɪ / in ˈhid ˈ / hɪd/ . Second , whether the vowel is stressed or not ; for example the vowel in the first syllable of the word (personal) /ˈpɜːsənl / is stressed and longer than the vowel in the first syllable of the word (personify) / pəsənˈfaɪ/ which is unstressed. The third factor is that length is affected by the way the syllable ends . This means that , if the syllable ends with a voiced consonant , the vowel will be long ; whereas if the syllable ends in a voiceless consonant   , the vowel will be   short . See the following examples :

bid	/ bɪd /	bit / bɪt/
sins	/ sɪnz /	since/ sɪns/
send	/ send/	sent / sent /
led	/ led /	let / let /
bad	/ bæd /	bat / bæt /
bun	/ bʌn /	bus / bʌs /
bead	/ biːd /	beat / biːt /
hard	/ hɑːd /	heart / hɑːt /
cord	/kɔːd /	caught / kɔːt /
rude	/ ruːd /	root / ruːt /
heard	/ hɜːd /	hurt / hɜːt /

The vowels in the first column are lengthened ; whereas those in the second column are shortened vowels .

2.4. Vowel Shortening

Carr (1993 :158) defines vowel shortening as the process in which a vowel is shortened . In general , a vowel is shortened before a voiceless consonant either word finally or before a voiced consonant . Kager et al. (1999: 58) define vowel shortening as a process in which a long vowel in a potentially occurring CVVC syllable is shortened into CVC . Vowel

shortening is defined by Jones (2006 :xi) as " a reduction in the measured acoustic duration of a vowel when a consonant or unstressed syllable is added to its neighborhood " .

We have mentioned previously that English long vowels are / i: , ɑ: , ɔ: , ɜ:, u: / while the short vowels are /ɪ , e , æ, ɒ, ʌ , ə , ʊ / . Long vowels can be shortened according to the nature of sounds which surround them (Ward , 1972 : 162) ; i.e. the length of vowels is determined by neighboring sounds (Algeo and Butcher ,2013 :88) . Jones (1957:234-235) mentions several cases for vowel shortening in English . The first case is that of long vowels becoming shorter when followed by a voiceless consonant rather than when final or followed by a voiced consonant . Before a voiced consonant , voicing does not stop whereas it has to stop before a voiceless consonant , the voicing has to stop   (Anyanwa , 2008: 110) . For example , the vowel /i:/ is shorter in ˈ seat ˈ   / si:t / than in sea /si:/ or in ˈseed ˈ/si:d / . The long vowels in the words ˈstaffˈ   /stɑ:f/ , ˈsortˈ /sɔ:t/ , and ˈuseˈ (noun) /ju:s/ are shorter than those in ˈstarˈ / stɑ:/ , ˈsawˈ / sɔ:/ , ˈyouˈ / ju:/ , ˈstarveˈ / stɑ:v/ , ˈswordˈ /sɔ:d/ , and ˈuseˈ (verb) /ju:z/.

The second case is that of long vowels being shortened when they occur before nasal consonants /   m , n , ŋ / or before /l/ followed by a voiceless consonant . For example , the vowel / ɜ: / in ˈlearntˈ / lɜ:nt/ is shorter than that in learn / lɜ:n / or that in learns / lɜ:nz / . The / ɔ: / in fault / fɔ:lt / is shorter than in fall / fɔ:l / or that in falls / fɔ:lz /. The third for vowel shortening is when long vowels occur in a stressed syllable which is immediately when an unstressed in the same word . For example , the vowel /i:/ in ˈleaderˈ /ˈ li:də/ is shorter than /i:/ in ˈ lead ˈ /ˈli:d /. The / ɔ:/ in drawing /ˈdrɔ:ɪŋ / , ˈcausesˈ /ˈ kɔ:zɪz/ are shorter than than those in ˈdraw ˈ / ˈdrɔ: / , ˈcauseˈ / ˈkɔ:z/ . The /u:/ in ˈ immunity ˈ /ɪˈmju:nɪtɪ / is shorter than that in ˈ immuneˈ /ɪˈmju:n/ .

The fourth case is that of long vowels becoming shorter in unstressed syllables rather than in stressed ones . For example , / ɔ: / in audacious /ɔ:ˈdeɪʃəs / and / ɑ: / in carnation / kɑ:ˈneɪʃn / are shorter than the same vowels in Agust /ˈ ɔ:gəst / and scarlet /ˈskɑ:lɪt /, respectively . The last case is where the English short vowels /ɪ , e , æ, ɒ, ʌ , ə , ʊ / also having variations of length . Short vowels are shorter when they occur before voiceless consonants than before voiced ones . For example , the vowel of ˈ mat ˈ / mæt / is shorter than that of mad /mæd / (Hualde , 2005: 14) . Sanders (2003 :98) gives several examples on this type of shortening :

bid   / bɪd /   bit / bɪt/

send	/ send/	sent / sent /	
sins	/ sɪnz /	since/ sɪns/	
led	/ led /	let / let /	
bad	/ bæd /	bat / bæt /	
bun	/ bʌn /	bus / bʌs /	

3. The Experimental Part

3.1. Introduction

To achieve the objectives of the study , a test was conducted as an attempt to investigate the ability of non-native speakers studying English at university level in recognizing vowel shortening in English .

3.2. Selection Of Stimuli

The test was made in the form of a test . It consists of BBC British pure vowels /ɪ , iː , e , æ ,ɑː , ɒ, ɔː , ʌ , ə, ɜː , ʊ , uː / carried by twelve target word pairs . The reason behind selecting word pairs especially the monosyllabic ones , was that vowel shortening becomes clearer under the effect of the following voiceless consonants . All the stimuli items were taken from well-known references , mainly , Jones (1957 : 126) ; (1969 : 51) , O'Connor (1980 :48) and Roach (2009 :170-171) .

3.3. CD-Tape Recording

The recorded words were spoken by English native speakers namely : Roach (2009: 170-189) and O'Connor (1980 :35-37) . The total time allotted for the production of each word pair was 6 seconds . This period of time was quite sufficient to allow the subjects listen to the test words produced and then recognize the shortened vowels .

3.4. The Subjects

Twenty- two males and one hundred and twenty- eight females acted as subjects in the test .They were chosen randomly from second stage students of the academic year (2013-2014) of the English Department , College of Education for Humanities , University of Basra . They were all native Iraqi Arabic speakers who passed a full year course in English Phonetics and phonology during the first year of their university education . They also,they studied vowel shortening in their first year . They reported no history of hearing defects .Most of the second stage learners of the academic year 2013-2014 took part in responding to the test . This was done for the purpose of providing as large as possible a sample of Iraqi learners , keeping in mind the conditions of time and the facilities available when the test was made .

3.5. The Answer Sheet

The 150 subjects were supplied with response sheets . In each sheet , there were twelve word pairs .The words were numbered from 1 up to 12 in the cassette . For example , no.1 in the answer sheet corresponds to the first test word , and no.2 in the answer sheet corresponds to the second test word in the cassette and so on. For each test word the subjects have two choices they had to recognize one of the choices which has the shortened vowel .They were informed to listen to the words and then recognize the shortened vowels .

3.6. Procedures

In order to obtain satisfactory and reliable results , the following steps are followed :

1- Conducting one test which aims at exploring the subjects' ability in recognizing vowel shortening .

2- A list of twelve items is presented .

3- Providing the subjects with tape recorded materials pronounced by native English speakers phoneticians .

4- Supplying written materials and asking the subjects to recognize the shortened vowels .

5- Conducting a multiple choice test to investigate the learners' ability in perceiving English shortened vowels in contrastive word pairs of CVC structure .

6- The test is conducted in a quiet room in the laboratory .

7- The test is performed in six sessions .

3.7. Statistical Test Used

In order to investigate whether the results are significant or not , the mean , and the t-test were used to compare the scores of the learners . The data of analysis were viewed by Statistical Package for Social Sciences (SPSS) .

3.8. Analysis of Data

3.8.1. The Subjects' Performance

The test is constructed to measure the subjects' performance in recognizing vowel shortening through single word pairs . The subjects are required to choose

the correct response for each item . The analysis shows the perceptual differences in the recognition of vowel shortening through word pairs as performed by 75 subjects . According to Jalabi (2005:70) , the researcher can take 27% from high scores and 27% from low scores of the subjects . This percentage can reduce the effort of the researcher . Thus , the total number of the subjects that is used to analyze is 75 subjects .

3.8.1.1. Pair Number One (bit /   bid)

Fifty - two subjects have recognized the shortened vowel / ɪ / which is in the word (bit) . This means that 23 subjects could not recognize the shortened vowels correctly . The subjects performed well in this pair because the mean is (1.693) . Table (1) shows that the calculated t-value for this pair is 3.607 which is higher than the tabulated t-value which is 1.96 .This means that the difference is statistically significant because the calculated t-value is higher than the tabulated t-value .

3.8.1.2. Pair Number Two (bet /   bed)

Sixty - three subjects have recognized the shortened vowel / e/ which is in the word (bet) whereas 12 could not recognize the shortened vowel correctly . The subjects proved to be good at recognizing the duration of the vowel in this pair . The mean of their achievements of this pair is 1.840 . The calculated t-value for this pair is 7.978 hence it is higher than the tabulated t- value which is 1.96 and the difference is significant .

3.8.1.3. Pair Number Three (batch /   badge)

Sixty - five subjects have recognized the shortened vowel / æ /which is in the word (batch) . Ten subjects could not recognize vowel shortening correctly . The students' performance is good. The mean is 1.866 and the calculated t-value is 9.279 . The difference tends to be significant because the calculated value is higher than the tabulated t- value .

3.8.1.4. Pair Number Four (buzz /   bus)

Fifty   subjects have recognized the shortened vowel / ʌ / which is in the word (bus) while 25 subjects could not recognize the shortened vowel correctly .The mean of their performance is 1.666 . The results are significant because the calculated t-value for this pair is 3.014 hence it is higher than the tabulated t-value which is 1.96 and the difference is significant .

3.8.1.5. Pair Number Five (clog / clock)

The subjects' performance in recognizing the shortened vowel / ɒ/ which is in the word (clock) is good because 52 subjects have recognized the correct answer and 23 subjects could not recognized the correct answer . The mean of their performance is 1.680 and the calculated t-value is 3.319 . The difference tends to be significant because the calculated t-value is higher than the tabulated t-value .

3.8.1.6 . Pair Number six   (pull / push)

Sixty - five subjects have recognized the shortened vowel /ʊ / which is in the word (push) . This means that 10 subjects could not recognize the shortened vowel correctly . The subjects' achievement in this pair was satisfactory . The mean of their performance is 1.866 . The difference is found to be statistically significant since the calculated t-value which reads 9.279 is higher than the tabulated t-value which is 1.96 .

3.8.1.7. Pair Number seven (again / attain)

Sixty - three subjects have correctly recognized the shortened vowel / ə / which is in the word (attain) . This means that 12 subjects could not recognize the shortened vowel correctly . The subjects' performance in this pair is good because most of the subjects have chosen the correct answer . The mean of their performance is 1.933 . The difference is statistically significant at the significance level (0.05) . The calculated t-value which is 14.444 is higher than the tabulated t-value .

3.8.1.8. Pair Number Eight (teeth / teethe)

The subjects' performance in recognizing the shortened vowel /i: / which is in the word (teeth) is very good because 70 subjects have recognized the correct answer .The mean of their performance is 1.906 .The calculated t-value which reads 12.026 is higher than the tabulated t-value which is 1.96 . This means that the difference is statistically significant at the significance level (0.05) .

3.8.1.9. Pair Number Nine (search / surge)

Concerning pair number nine , the subjects' performance was satisfactory . The mean of their performance is 1.933 because the high number of the subjects have correctly recognized the shortened vowel / ɜ: / which is in the word (search) . The

achievement is found to be statistically significant because the calculated t-value is 14.944   hence it is higher than the tabulated t-value which is 1.96 .

3.8.1.10. Pair Number Ten (heart /   hard)

The subjects proved to be good in dealing with this pair . Seventy subjects have recognized the shortened vowel / ɑː / which is in the word (heart) . The mean of their achievement is 1.880 and the calculated t-value for this pair is 10.059 which is higher than the tabulated t-value . Thus , the difference is statistically significant .

3.8.1.11. Pair Number Eleven (caught / cord)

The subjects' performance in recognizing the shortened vowel / ɔː / which is in the word (caught) is well because 66 subjects have recognized the correct answer whereas 9 subjects could not recognize the shortened correctly . The mean of their performance is 1.933 and the calculated t-value is 14.944 . The difference tends to be significant because the calculated t-value is higher than the tabulated t-value .

3.8.1.12. Pair Number Twelve (prove / proof)

The subjects' performance in recognizing the shortened vowel /uː / which is in the word (proof) is very good because 68 subjects have recognized the correct answer . The mean of their performance is 1.906 .The calculated t-value which reads 12.026 is higher than the tabulated t-value which is 1.96 . This means that the difference is statistically significant . The following tables and histograms exhibit the results .

Table (1) : Means , Std Deviation and T-value of single word pairs

No.	Mean	Std Deviation	T-Value		Significance
			Calculated t-value	Tabulated T-Value	
1	1.693	0.464	3.607	1.96	Sig.
2	1.840	0.369	7.978	1.96	Sig.
3	1.866	0.342	9.279	1.96	Sig.

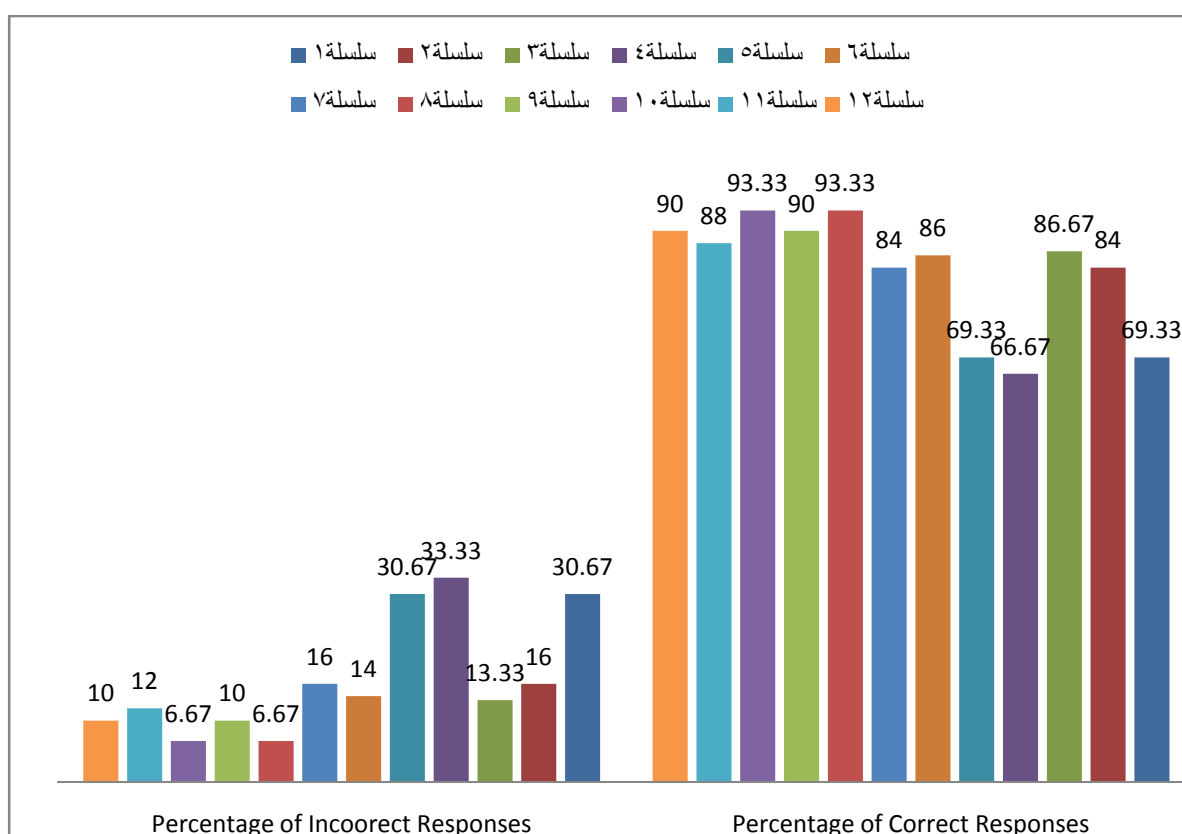|					
4	1.666	0.474	3.041	1.96	Sig.
5	1.680	0.469	3.319	1.96	Sig.
6	1.866	0.342	9.279	1.96	Sig.
7	1.933	0.251	14.944	1.96	Sig.
8	1.906	0.292	12.026	1.96	Sig.
9	1.933	0.251	14.944	1.96	Sig.
10	1.880	0.327	10.059	1.96	Sig.
11	1.933	0.251	14.944	1.96	Sig.
12	1.906	0.292	12.026	1.96	Sig.

Figure (5) : Histogram of the Subjects' Achievement in Single Word Pairs

Table (2) : Means , Std Deviation and T-value of shortened short vowels

No.	Mean	Std Deviation	T-Value		Significance
			Calculated t-value	Tabulated T-Value	
1	1.545	0.509	2.416	1.96	Sig.
2	1.863	0.351	4.856	1.96	Sig.
3	1.909	0.294	6.521	1.96	Sig.

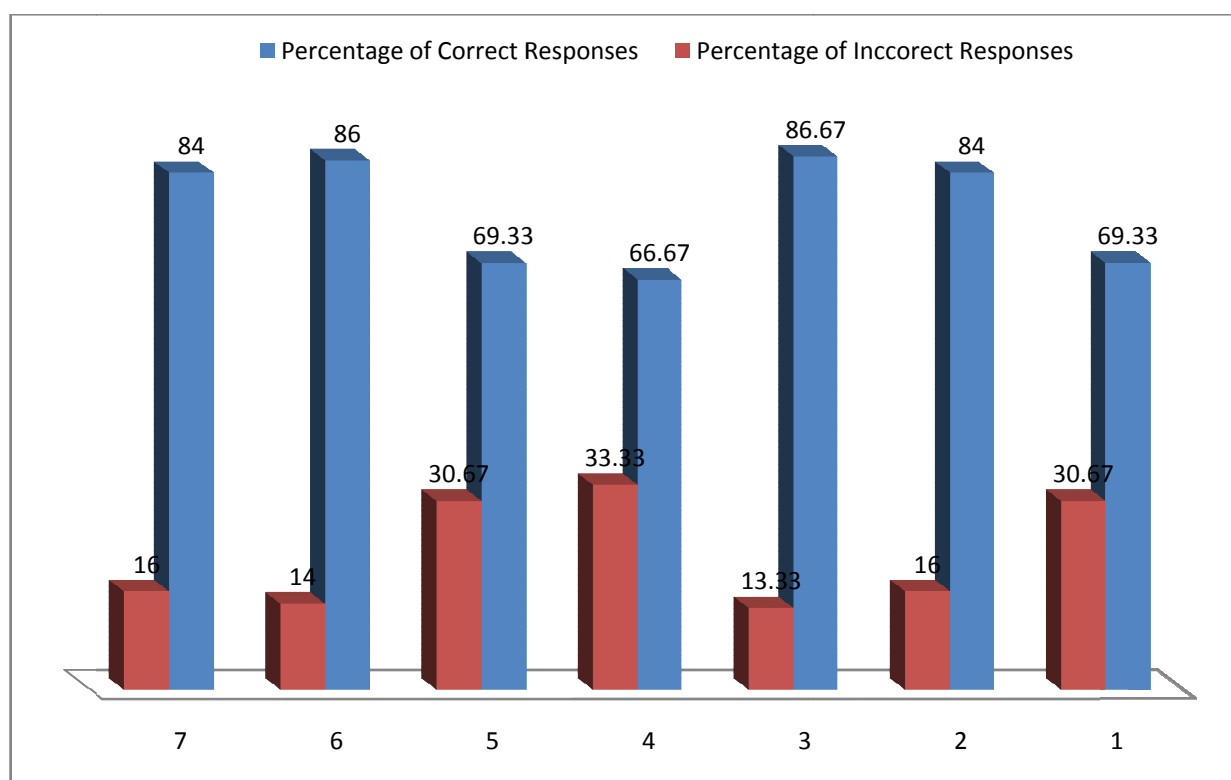|					
4	1.772	0.428	2.982	1.96	Sig.
5	1.772	0.428	2.982	1.96	Sig.
6	1.818	0.394	3.780	1.96	Sig.
7	1.818	0.394	3.780	1.96	Sig.

Figure (6) : Histogram of the Subjects᾿ Achievement in Recognizing the shortened short vowels

Table (3) : Means , Std Deviation and T-value of shortened long vowels

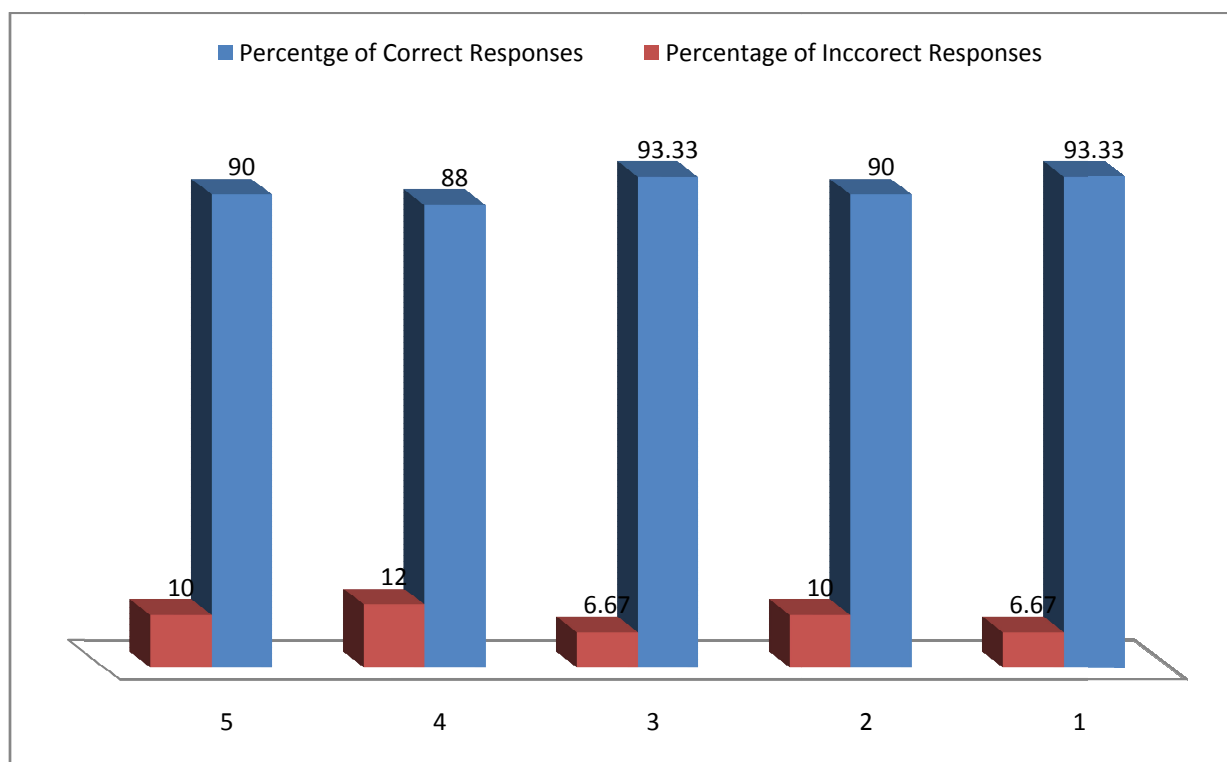| No.	Mean	Std Deviation	T-Value		Significance
			Calculated t-value	Tabulated T-Value	
1	1.933	0.251	14.944	1.96	Sig.
2	1.893	0.310	10.961	1.96	Sig.
3	1.773	0.421	5.616	1.96	Sig.
4	1.880	0.327	10.059	1.96	Sig.
5	1.893	0.310	10.961	1.96	Sig.

Figure (7) : Histogram of the Subjects' Achievement in Recognizing the

shortened Long vowels

3.8.2. Testing Performance Differences Between the Males and the Females

Our aim in this section is to find out whether there are any differences between male and female in performance .The males and females' achievement in recognizing vowel shortening in single word pairs are shown in the following subsections . According to Jalabi (2005: 55) , we can equate the number of males and females in order to get the perfect results regarding gender performance .Therefore , we have chosen 22 males and 22 females randomly . The present researcher has used number (1) to refer to females and number (2) to refer to males .The tabulated t-value at the level of significance (0.05) with 44 as the degree of freedom is 2.06

3.8.2.1. Males and Females' Performance

The performance of males and females is presented in the following table

Table (4) : Males and females' Performance

No.	Gender	Number of Correct Responses	Number of Incorrect Responses
١	١	٢٠	٢
	٢	22	0
٢	١	٢١	١
	2	21	١
٣	١	22	.
	٢	٢٢	0

		٧٥	
٤	١	٢١	١
	٢	20	2
٥	١	١٨	٤
	٢	١٥	7
٦	١	٢٠	٢
	٢	٢٠	٢
٧	١	٢٠	٢
	٢	٢٠	٢
٨	١	٢٠	2
	٢	٢٠	2
٩	١	١٩	3
	٢	٢٠	2
١٠	١	١٨	٤
	٢	٢٠	2
١١	١	٢١	١
	٢	٢٠	٢
١٢	١	٢٢	٠
	٢	٢٢	٠

The following table shows the statistical results :

Table (5) : Means , Std Deviation and T-value of gender differences

No.	Gender	Mean	Std Deviation	T-Value		Significance
				Calculated t-value	Tabulated T-Value	
١	1	0.91	0.294	-1.449	2.06	Non.
	2	1.00	0.000	-1.449	2.06	
2	١	0.95	0.213	-1.000	2.06	Non.
	٢	1.00	0.000	-1.000	2.06	
3	1	1.00	0.000	0.446	2.06	Non.
	2	0.91	0.294	0.455	2.06	
4	1	0.95	0.213	-1.000	2.06	Non.
	2	1.00	0.000	-1.000	2.06	
5	1	0.64	0.492	-2.230	2.06	Non.
	2	0.91	0.294	-2.230	2.06	
6	1	1.00	0.00	1.000	2.06	Non.
	2	0.95	0.213	1.000	2.06	
7	1	1.00	0.000	0.000	2.06	Non.
	2	1.00	0.000	0.000	2.06	
8	١	0.91	0.294	0.866	2.06	Non.
	٢	0.91	0.294	0.866	2.06	

9	1	0.91	0.294	0.000	2.06	Non.
	2	0.82	0.294	0.000	2.06	
10	1	0.82	0.395	0.000	2.06	Non.
	2	0.82	0.395	0.000	2.06	
11	1	1.00	0.000	1.449	2.06	Non.
	2	0.91	0.294	1.449	2.06	
12	1	0.95	0.213	0.507	2.06	Non.
	2	0.91	0.294	0.507	2.06	

   An inspection of each of the examined pairs reveals the absence of any significant differences between males and females ,because the calculated t-value of both gender types for the single word pairs is less than 2.06 . The calculated t-value for the entire test for females is   -1.404 , and the calculated t-value for the entire test for males is 0.578 which are lower than the tabulated t-value , that is 2.06 .
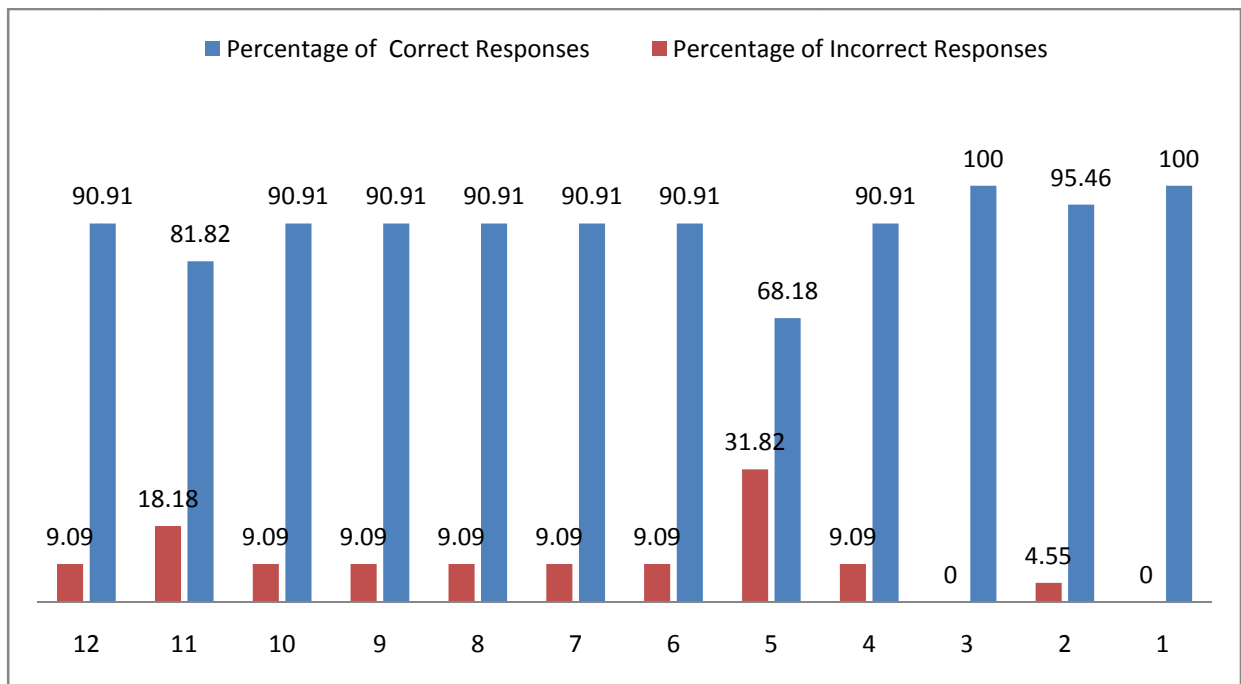
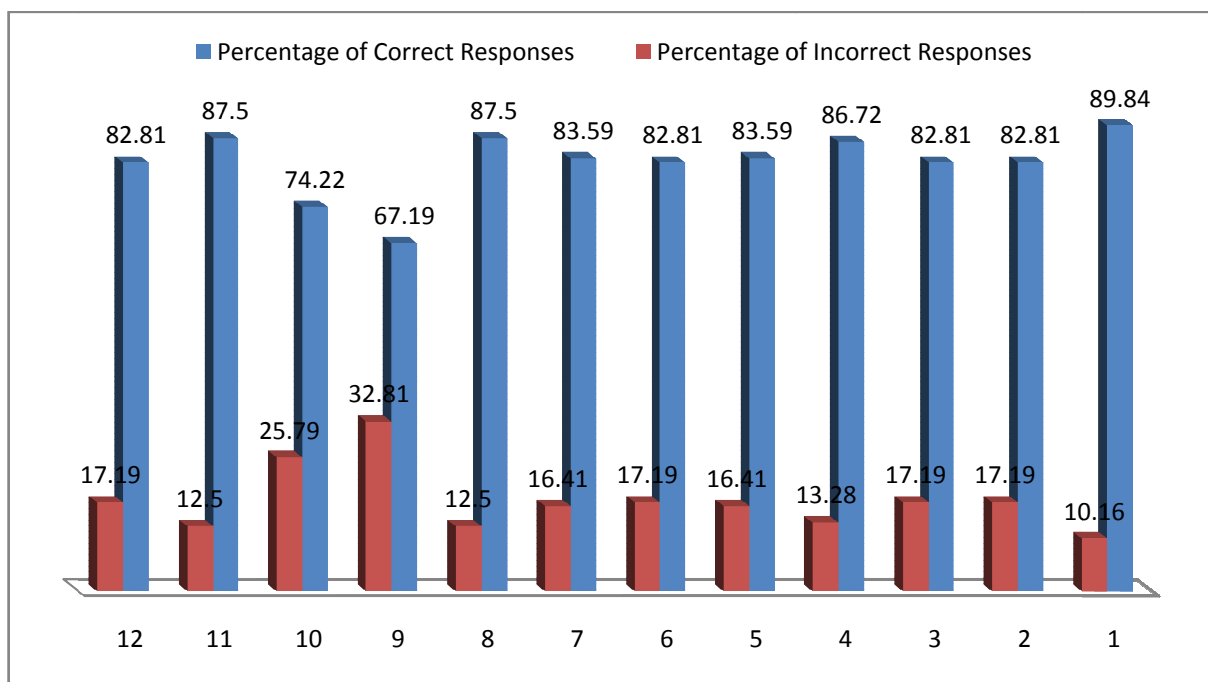Figure (8) : Histogram of The Males' Achievement

Figure (9) : Histogram of The Females' Achievement

3.9. Discussion of Results

For the first pair which is (bit   /   bid) , the subjects have no difficulty in recognizing the shortened vowel / ɪ / which is in the word (bit) . The final consonant / t / is a voiceless plosive . It is clear that the fortis plosives reduce the preceding vowel . The /t/ sound is aspirated and this cue is important for the listener to distinguish the fortis and lenis sounds .

As for the second pair which is (bet / bed) , the subjects also show no problem in recognizing the shortened vowel / e / which is in the word (bet). It has been noticed that this vowel is sometimes confused with / ɪ / . The final consonant / t / sound is a voiceless plosive . This means that the fortis plosives shorten the preceding vowel .The /t/ sound is aspirated and this aspect is important for the subjects to distinguish the fortis and lenis sounds

Concerning the pair (batch /   badge) , the subjects have no difficulty in recognizing the shortened vowel / æ / which is in the word (batch). / tʃ / is a voiceless affricate sound . Similar to above a fortis affricate reduces the length of the preceding segments .As for the pair (buzz / bus) , the subjects also show no problem in recognizing the shortened vowel / ʌ / which is in the word (bus). The final sound / s/ is a voiceless fricative which reduces the length of the preceding vowel .

Regarding the vowel / ɒ / in the pair (clock / clog   ) , the subjects also show no problem in recognizing the shortened vowel / ɒ / which is in the word (clock)   . The / k / is a voiceless plosive sound and it reduces the length of the / ɒ   / vowel . As for the vowel / ʊ / in the pair (push   /   pull) , the subjects also show no problem in recognizing the shortened vowel / ʊ / which is in the word (push) .The / ʃ / is a voiceless fricative sound and it reduces the length of the   / ʊ / vowel .

As for / ə / in the pair (attain / again) , it seems that the subjects have no problem in recognizing the shortened vowel / ə / in the word (attain) because of its frequent occurrence in English unaccented syllables .The final consonant which is / t / is a voiceless plosive sound . So , it is obvious that this voiceless plosive shortens the length of the preceding vowel which is / ə / . Concerning the pair (teeth   /   teethe) , the subjects have no difficulty in recognizing the shortened vowel / i: / which is in the word (teeth). The final consonant is / θ / which is a fricative sound reduces the length of the preceding vowel .

As for the vowel / ɜ: / in the pair (search / surge) , the subjects did not find a difficulty in recognizing its shortened form / ɜ: /. The   final sound / tʃ / is a voiceless affricate that reduces the length of the preceding vowel . The vowel / ɑ: /

in the pair (heart / hard) , shown to be unproblematic for the subjects. The final consonant / t / sound is voiceless plosive. It is clear that the fortis plosives reduce the preceding vowel. The / t / sound is aspirated and this cue is important for the listener to distinguish the fortis and lenis sounds .

The vowel / ɔː / in (caught / cord) has not been problematic for the subjects . The / t / is a voiceless plosives sound . Voiceless plosive reduces the length of the preceding vowel . The vowel / uː / in the pair (proof / prove), also has not been problematic for the subjects . The final consonant / f / is a voiceless fricative which reduces the following vowel .

The subjects have shown no difficulty in recognizing the shortened long vowels / iː , ɜː , ɑː , ɔː , uː / in the words (teeth , search , heart , caught , proof) more than recognizing the shortened short vowels. Iraqi learners have not found a difficulty in identifying the shortened long vowel / ɜː / Iraqi learners easily recognized the shortening of long vowels more than short vowels .

The third hypothesis is not validated because there are non significant differences between males and females , because the calculated t-value of both sexes for the single word pairs is less than 2.06 . The calculated t-value for the entire test for females is -1.404 , and the calculated t-value for the entire test for males is 0.578 which are lower than the tabulated t-value , that is 2.06 .

4. Conclusions

The major conclusions that can be drawn from the present investigation are the following :

1- Since the voicing feature of voiced consonants in English has long been cited as a crucial cue for vowel duration , we conducted a perceptual experiment to see whether Iraqi learners were aware of vowel duration and the effect of a final consonant on the preceding vowel duration or not . Nevertheless , voiced and voiceless consonants did seem to be an available cue for distinguishing vowel duration in single word pairs , for example (bit / bid) , (bet / bed) , and (batch / badge) .

2- It is quite evident that Iraqi EFL learners were competent enough in recognizing vowel shortening .

3- Perceptually , Iraqi EFL learners were not much affected by the phonemic inventory of their native language , especially in as far as the perception of centralized vowels / ə / and / ɜː / are concerned .

4- Duration was found to affect the realization of Iraqi learners for long vowels more than the remaining short vowels .

5- The data presented here provide a strong confirmation for the first and second hypotheses presented in section 1.4 because the statistical means and differences are significant .The data that are related to the third hypothesis (gender differences) provide aweak confirmation because the statistical analysis is non significant .

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Appendix : The Test items

Dear student,

You are kindly requested to listen to the following words spoken by a native
speaker of English and recognize the shortened vowels .

General information

Name :

Gender : Male   Female

1- b<u>it</u>   b<u>i</u>d

2- b<u>e</u>t   b<u>e</u>d

3-b<u>a</u>tch   b<u>a</u>dge

4-b<u>uzz</u>   b<u>us</u>

5-cl<u>og</u>   cl<u>o</u>ck

6-p<u>ull</u>   p<u>u</u>sh

7-<u>a</u>gain   <u>a</u>ttain

8-t<u>ee</u>th   t<u>ee</u>the

9-s<u>ea</u>rch   s<u>u</u>rge

10-h<u>ea</u>rt   h<u>a</u>rd

11-c<u>au</u>ght   c<u>o</u>rd

12-pr<u>o</u>ve   pr<u>oo</u>f

تمييز تقصير اصوات اللين في اللغه الانجليزية من متعلمي اللغة الانجليزية

في المستوى الجامعي : دراسه سمعية

الملخص :

يعد هذا البحث دراسة تجريبية لتمييز عملية تقصير اصوات اللين في اللغة الانجليزية من قبل متعلميها من العراقيين في مراحل متقدمة . فهو في الواقع دراسه سمعيه يقع في ثلاثة اجزاء : جزء نظري واخر عملي واستنتاج .

يبين الجزء النظري المعايير التي تم استخدامها في تصنيف ووصف اصوات اللين في اللغة الانجليزية وذكر خصائصها ومن ثم ذكر الفروقات بين اصوات اللين والاصوات الصحيحة . ويعرف ايضا عملية تقصير اصوات اللين وانواعها. بينما يركز الجزء العملي على الاختبار الذي اجري في هذا البحث ومناقشة اهميته و يستعرض الاسلوب الذي اتبع في اجراء خطوات الاختبار المطلوبة في الدراسة وكذلك تحليل العينات المختارة حيث يعتمد هذا التحليل وبنسبة كبيرة على الاختبار التائي الاحصائي كما ويقدم هذا الفصل مناقشة النتائج النهائية . ويعرض الجزء الاخير المستخلصات الاساسية لهذه النتائج .

ينتهي البحث بقائمه المراجع التي اعتمد عليها البحث وملحق .