A Theoretical Study of English and Arabic Vowels with Reference to Cardinal Vowels

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Abstract
This paper focuses on the vowels of English and standard Arabic (SA). It is concerned specifically with the differences and similarities in pronunciation of the vowels of the two languages. The researcher has found, through her working in teaching phonetics at university level that many of Iraqi students may confuse or rather do not recognize the difference in pronunciation of the vowels between their native language and the English ones. Thus, they may mispronounce the English vowels since some of them seem to be similar to their native language. It is hoped that this study will help both the teachers and students or learners of English in a better understanding the true nature of vowels of their own language. Besides, such comparison between the two languages needs to refer to a standard system which enable us to state the exact production of the sound. Hence, this study sheds light on the cardinal vowels system and its relationship to the English and Arabic vowels.
دراسة نظرية لاصوات العلة في اللغتين الانكليزية والعربية مع
الإشارة لنظام الحركات المعيارية
إعداد زينب عبدي علي

ملخص:
يركز البحث الحالي على الحركات للغتين الانكليزية والعربية. يهتم هذا البحث بشكل خاص مع الاختلافات والتشابه في نطق الحركات للغتين. وقد وجدت الباحثة من خلال تدريس علم الصوت في مرحلة الجامعة بأن العديد من الطلاب العراقيين ربما يختلطوا أو نوعا ما لا يدركون الفرق في التلفظ للحركات بين لغتهم الأم ونظرت催化 في اللغة الانكليزية. ولهذا، هؤلاء الطلاب ربما سيسيرون نطق الحركات الانكليزية بسبب أن بعضها تبدو مشابهة إلى لغتهم الأم. تتمكن الباحثة أن تساعد هذه الدراسة كل من الأساتذة والطلاب أو متعلمي اللغة الانكليزية على فهم أفضل للطبيعة الصحيحة لحركات لغتهم الأم. بالإضافة إلى ذلك، تحتاج مثل هذه المقارنة بين اللغتين إلى الاعتراف في نظام معياري يمكننا أن نستند إلى النطق المضبوط للصوت. ولهذا، تأتي هذه الدراسة الضوء على نظام الحركات المعيارية وعلاقته بالحركات في اللغتين الانكليزية والعربية.

1. Introduction

As a matter of fact, speech mainly depends on hearing and any language can be learned by listening and imitating it. It is well known that any child can learn any language perfectly if he/she is brought up surrounded by that language no matter where it was born or whose parents were. But as the child grows up, his/her ability becomes less to master the pronunciation (as well as other parts) of any foreign language. This is due to that our native language will not allow us since the habits of our language are so strong to break. So, we need a great effort to build a good knowledge of English language for foreign adult learner of English.

Vowels are more difficult than consonants and even those who are specialists in English can not pronounce them exactly like the native speaker. The misarticulation of the vowels leads to
misunderstanding and confusion to the hearers since the vowels are very close to each other in their articulation among the foreign languages. Besides, the misarticulation of the vowels is clearer and stronger than consonants and any native speaker feels difficult to illustrate such misarticulation to any foreign learner (Bisher, 1975:137-138). Many foreign learners of English do not realize that they make mistakes or may confuse in pronouncing some English vowels which do not exist in their native language. Vowels in English and Arabic have similarities and differences. They are different in number and English has more vowels than English. Both languages have some common vowels, but at the same time there are some vowels that are restricted to each one of them. Thus, this paper shows the values of the standard Arabic vowels by comparing them to the English ones. In this way, both teachers and students may focus on them for the sake of a better understanding of the English vowels.

The researcher depends on the English pronunciation symbols used in Better English Pronunciation by J.D.O’Conner, the textbook taught for first year students at the college of education /English Departments. This pronunciation is referred to as Received Pronunciation (RP), the sort of English used by educated native speakers in south-east England. Because of the different varieties of the Arabic language, the researcher concentrates on the standard Arabic sounds and their general features regardless the changes in their pronunciation in certain context; which is not our subject in this study.
List of English Vowels

<table>
<thead>
<tr>
<th>Simple vowels</th>
<th>Diphthongs</th>
<th>Vowel Sequences (Triphthongs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. /I/ as in fil / fila/</td>
<td>/ei/ as in fail / fail</td>
<td>/aI/ as in player / pleI</td>
</tr>
<tr>
<td>2. /a:/ as in feel / fila/</td>
<td>/ai/ as in file / fall</td>
<td>/Ia/ as in employer / Impl Ia</td>
</tr>
<tr>
<td>3. / as in cot / keI/</td>
<td>/ I/ as in foil / fall</td>
<td>/al/ as in flyer / flaI</td>
</tr>
<tr>
<td>4. / as in fell / fell/</td>
<td>/ai/ as in fall / fall</td>
<td>/a / as in flower / fla</td>
</tr>
<tr>
<td>5. / as in ful / foI/</td>
<td>/a / as in mouth / maI/</td>
<td>/a / as in grower / gruI</td>
</tr>
<tr>
<td>6. /u:/ as in fool / foI/</td>
<td>/ Ia/ as in tier / Ima/</td>
<td></td>
</tr>
<tr>
<td>7. /eI/ as in fell / fel/</td>
<td>/ea/ as in tear / teI/</td>
<td></td>
</tr>
<tr>
<td>8. /aI/ as in cat / keI/</td>
<td>/a / as in tear / teI/</td>
<td></td>
</tr>
<tr>
<td>9. / as in cart / k :t/</td>
<td>/a / as in tour / t :a/</td>
<td></td>
</tr>
<tr>
<td>10. /a/asin about /abaut/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. / / as in cut /k :t/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. / / as in cut /k :t/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List of Arabic Vowels

<table>
<thead>
<tr>
<th>Vowels</th>
<th>Diphthongs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. /a/ as in /fan/ ( فن ) (art)</td>
<td>/aw/ as in /?aw/ ( او ) (or)</td>
</tr>
<tr>
<td>2. /aI/ as in /baab/ ( باب ) (door)</td>
<td>/aj/ as in /laI/ ( ليث ) (lion)</td>
</tr>
<tr>
<td>3. /i/ as in /bIml/ ( بن ) (girl)</td>
<td></td>
</tr>
<tr>
<td>4. /ii/ as in /mill/ ( ميل ) (mile)</td>
<td></td>
</tr>
<tr>
<td>5. /u/ as in /XuI/ ( خد ) (take)</td>
<td></td>
</tr>
<tr>
<td>6. /uu/ as in /nuur/ ( نور ) (light)</td>
<td></td>
</tr>
</tbody>
</table>

1.1 Cardinal Vowels

The researcher has found that a brief look about the cardinal vowels system is important for this study. This system is a standard reference which enables us to state the exact position of the tongue for a certain vowel of any language and we could relate our particular sound (Christophersen :1956:30). Besides, it is a very accurate and known way of classifying vowels and shows the range of vowels that the human vocal apparatus can make. It is
devised by the phonetician Daniel Jones and this system includes primary and secondary vowels. The primary cardinal vowels are vowels that are most familiar to the speaker of most European languages (Roach, 2000:13). The secondary cardinal vowels are vowels that sound less familiar and they will not be taken into consideration since they are irrelevant to our study. The vowel quality of the cardinal vowels is classified into three elements: (1) tongue position (2) lip-position (3) tenseness and laxness. Jones (1957:36) represents the eight cardinal vowels that are produced by the tongue in the following diagram:

![Figure 1: Tongue-Positions of the Primary Cardinal Vowels](image-url)

Accordingly, Jones (Ibid.: 36-42) classifies the tongue-positions of vowels into two types:
(1) the height to which the tongue is raised
(2) the part of the tongue which is raised highest

The vowels are classified and described according to the first type as follows:

a) Close vowels: they are vowels in which the tongue is raised as high as possible like the vowels /i-u/.

b) Half-close vowels: they are vowels in which the tongue occupies a position about one-third of the distance from 'close' to 'open' like the vowels /e-o/.
c) Open vowels: they are vowels in which the tongue is as low as possible like the vowels like /ə/.
d) Half-close vowels: they are vowels in which the tongue occupies a position about two-thirds of the distance from 'close' to 'open' like the vowels /a-ə/

The second type according to which cardinal vowels can be classified is the part of the tongue which is raised highest. This type is classified as follows:
a) front vowels: they refer to the formation of which the 'front' of the tongue is raised towards the hard palate, i.e., the vowels which have their tongue-positions on or near the line /i- ə/.
b) Back vowels: they refer to the formation of which the back of the tongue is raised towards the soft palate, i.e., vowels which have their tongue-positions on or near the line /ə-ʊ/.
c) Central vowels: vowels in which the highest point of the tongue is in the centre part of the vowels.

Figures (2) and (3) represent the approximate tongue-positions of these vowels.

Figure(2) Approximate Tongue-positions of the Front Cardinal vowels.                             Figure(3) Approximate Tongue – positions of the Back Cardinal Vowels

(2)Lip-positions: this element can be classified as follows:
a) Spread: vowels with spread lips are considered unrounded like cardinal no.(1)/i/.
b) Rounded lips: the lips are classified into close lip-rounding and open lip-rounding like cardinal vowels no.(6)/u/ and no.(8)/u/.
c) Neutral lips: lips are considered unrounded as in cardinal vowel no.(5)/α/.

Tenseness and laxness that has an important contribution in determining the vowel quality is the state of the tongue and lips in relation to muscular tension. In this respect, vowels are classified into two classes:

a) Tense vowels: they are vowels that are produced with muscular tension on the part of the tongue.
b) Lax vowels: they are vowels that are produced without any muscular tension on the part of the tongue.

Thus, the difference in quality between tense and lax vowels is due to a difference of tension like the English vowels in seat /si:t/ and sit /sIt/.

However, the researcher has found that explaining the English and Arabic vowels with reference to cardinal vowels in detail take more pages of this paper and it is helpful to state the English and Arabic vowels and their approximation counterparts of the cardinal vowels. Thus, the following table can summarize the English and Arabic vowels and their counterparts of the cardinal vowels.

Table (1) The English and Arabic vowels and their counterparts of the cardinal vowels

<table>
<thead>
<tr>
<th>The English vowels and their approximation counterparts of the cardinal vowels</th>
<th>The Arabic vowels and their approximation counterparts of the cardinal vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. /i/ is close to the center than cardinal vowel no.(1)/i/</td>
<td>1./a/ is close to cardinal vowel no.(4)/a/</td>
</tr>
</tbody>
</table>
2. /i/ is close to cardinal vowel no(1)/i/
3. /u/ is close to cardinal vowel no.(5)/u/
5. / / has no close cardinal vowel
6. /u:/ is close to cardinal vowel no.(8)/u/
7. /æ/ is in a middle position between cardinal vowel no.(2)/e/ and no.(3)/a/
8. /a/ is in a middle position between cardinal vowel no.(3)/a/ and no.(4)/a/
9. /a:/ is close to cardinal vowel no.(5)/u/
10. /a/ has no close cardinal vowel.
11. / / has no close cardinal vowel
12. /u/ has no close cardinal vowel

In addition to that, the English and Arabic vowels with reference to the cardinal vowels can be represented in the following diagram:

![Figure (4) English and Arabic vowels and cardinal vowels](image)

1.2 English Vowel Sounds

It is important to note that in all the languages the vowels are formed with the air passage through different mouth-shapes that are caused by different positions of the tongue and of the lips.
differences are more difficult to be seen and described than lip
differences since the vocal organs involved are so minute that it is
impossible to assess them by visual means. Figure (5) is a diagram
showing the parts of the tongue which are important to recognize
for English vowels (O’Conner, 1980:18)

Figure (5) The parts of the tongue of English language

Furthermore, the major movable organs that are responsible
for producing the vowels are the soft palate, lips, and
tongue. There are many definitions of the vowel but the most
important one is given by Daniel Jones (1957:23-29) who defines
the vowel as "a voiced sound in forming which the air issues in a
continuous stream through the pharynx and mouth, there being no
obstruction and no narrowing such as would cause audible
friction". Hence, the characteristic qualities of vowels based on the
shape of the open passage forms a resonance chamber which
modifies the quality (tamber) of the sound produced by the
vibration of the vocal cords. Different shapes of the passage modify
the tamber in different ways and consequently this will lead to
produce a distinct vowel sound. Figure (6) is a diagram showing
the area (the dotted line) in which the vowel sounds can be
produced (the tongue must be in position below the dotted line when
the breath-force is normal and in this way the vowel sound will be
heard).
It is important to mention the major characteristics of the vowels which are stated by some phoneticians as the following:

1) All the vowels are voiced whether they are oral or nasalized vowels, i.e., there is a vibration in the vocal cords.

2) The vowels are sounds that are articulated without any stricture in the air passage and the air passes continually through the pharynx and the mouth (Crystal, 1987:152).

3) The most important feature of the vowels is that their auditory sonority strength is more clear than consonants in terms of auditory relationships (Bisher, 1975:74).

Generally, Gimson (1970:35), AL-Hamash (1984:33) and Roach (2002:15) describe the English vowels according to four major variables (1) frontness-backness (2) tongue height (3) the shape of the lips (4) the position of the soft palate.

1) Frontness-backness: They mean that part of the tongue raised towards the palate, i.e., the highest point of the tongue arch. Vowels are usually front like /iː, eɪ, ɪ, ɜː/ central like /ə, ɒ, ʊ/ and back like /aː, ɔː, uː/.
2) Tongue height: it refers to the extent to which the tongue rises in the direction of the palate. Gradually, vowels are classified as follows:
   a. Close vowels like /i:, u: /
   b. Open vowels like /a:, /
   c. Half close vowels like /ɪ, , : /.
   d. The vowels between half close and half open positions like /e, , : /.
   e. Half open vowels like /, œ /
   f. The vowels between half open and open position like / /

   Besides, it is very difficult to be aware of the position of the tongue in vowels, but it is possible to get an impression of the tongue height by observing the position of the jaw while saying the words (Ladafoged, 1975: 74).

3) The shape of the lips, i.e., whether the lips are spread like /i:, ɪ /, rounded like /u:, , :, /, or neutral like /, œ , , : /.

4) The position of the soft palate: the part of the soft palate is raised for oral vowels whereas it is lowered for nasalized vowels (Crystal, 1987: 152). Nasalized vowel is the case in which the soft palate is lowered and the air can pass through the nose and the mouth, for example, the word 'can' /'kæn/ can be pronounced as /kæ/ indicating that the vowel /æ/ is nasalized with the soft palate lowered since it is followed by nasal consonant (O'Conner, 1980: 50). However, all the following English vowels that will be described are oral ones in which the air completely passes through the mouth.
Accordingly, O’Conner (Ibid.: 79-90) classifies the English vowels into three categories (1) simple vowels (2) diphthongs (3) vowel sequences. Jones, AL-Hamash, Gimson and O’Conner have agreed on the description of the following vowels as follows:

(1) Simple Vowels: These include short and long vowels and they are also called pure vowels as they remain constant and do not glide. There are seven short vowels and five long vowels. The total simple vowels are twelve which are /I, i:, :, u:, e, æ, :ə, ə/. Table (2) shows the classification of the English simple vowels.

<table>
<thead>
<tr>
<th>Tongue Height</th>
<th>Tongue Retraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front</td>
<td>Central</td>
</tr>
<tr>
<td>High</td>
<td>i:</td>
</tr>
<tr>
<td>Mid</td>
<td>e</td>
</tr>
<tr>
<td>Low</td>
<td>æ</td>
</tr>
</tbody>
</table>

Table (2) The Classification of the English Simple Vowels (adopted from AL-Hamash, 1984)

However, the simple vowels are described as follows:

a) /I/: It is a high front unrounded short vowel. It is shorter than the vowel /i:/ but the position of the tongue and lips is similar to the long /i:/ but the tongue is lower and retracted. This vowel is pronounced when the height of the tongue is nearly half-close and the highest of the tongue part is the hinder part of the front. The lips are slightly spread. AL-Hamash (1976:5) states that this vowel is similar
to, but shorter than, the Arabic short vowel 'kasrah' /i/ as in /min/(من) (from).

b) /i/: It is a high front long unrounded vowel. It is produced when the height of the tongue is nearly close and the part of tongue which is highest is the center of the front. The lips are slightly spread. It is very similar but it is a little longer than the Arabic long vowel 'jaa' /ii/ as in /fiil/ (فیل) (elephant) (Al-Hamash, Ibid.; Tiffen, 1976: 24)

c) /ouis/: It is a mid back rounded short vowel. It is formed with the tongue when it is held in the lowest and most backward position. The highest of the tongue is fully open and the highest of the tongue part is the back. English foreign learners usually substitute this vowel for /a/ vowel and pronounce words like phonetics /fənetiks/ as /f netɪks/.

d) /ouis/: It is a mid central rounded long vowel. It is longer than the short vowel /ouis/ but is nearer in quality to it. The lips are more rounded than the short vowel /ouis/. English foreign learners usually confuse between this vowel and the short one /ouis/.

e) /ouis/: It is a high back rounded short vowel. It has a tongue-position considerably higher than the long /ouis/ and almost advanced. It is produced when the height of the tongue is just above half-close and the highest of the tongue part is the front part of the back. The lips are fairly rounding. AL-Hamash (1976:13) and Tiffen (Ibid.: 27) indicate that this sound is approximately close to the Arabic short vowel 'amma'/u/ as in /kutub/ (كتب) (books).
f) /u:/ : It is a high rounded long vowel. It is longer than the short vowel /u/ but it is near in quality to /æ/. The height of the tongue is nearly close and the highest of the tongue part is the back. The lips are close rounding. It is similar to the Arabic long vowel 'waaw'/uu/ as in /duur/ (دور) (houses) (Al-Hamash, Ibid.:4).

g) /e/ : It is a mid front unrounded short vowel. It is very close in quality to /I/. This is why English foreign learner substitutes /I/ for this vowel. It is produced when the height of the tongue is intermediate between the half-close and half-open. The part of the tongue which is raised is the front, and the lips are slightly spread.

h) /æ/: It is a low front unrounded medium or short vowel. The lips are quite open. It is produced when the height of the tongue is between half-open and open and the highest of the tongue part is the front. There is no similar Arabic vowel which is equivalent to this vowel but the Arabic speakers substitute for /æ/ a fully open vowel, e.g. the /aa/ in /baab/ 'door'. (Tiffen, Ibid.:25)

i) /a:/ : It is a low back unrounded long vowel. It is produced when the tongue is low in the mouth. It is produced when the tongue is held very low down in the mouth. The height of the tongue is fully open and the highest of the tongue part is in the point somewhat in advance of the center of the back. The lips are neutral. Gimson (1970:113) assures that /a:/ and /a/ in RP may be heard in such words where the vowel is followed by /f, θ, ð, s/ or by nasal consonant + consonant like
"lather, transfer, elastic, plastic, etc.. AL-Hamash (1976:5) states that this vowel is similar somewhat to the Arabic long vowel ' alif' /aa/ as in /saara/ (سار) (he walked).

j) /ə/: It is a mid central unrounded short vowel. It is called central or neutral vowel. It is a short version of /ː/. This vowel is not clear and it seems like /a/ when it occurs in final position before a pause as in Asia /eI ə/. However, this vowel when it is followed by velar consonants /k, g, ʁ/, the tongue is slightly more raised and retracted, e.g., 'long ago' /l ʁæɡə/ but in final position like in 'mother' /mæðə/, it is articulated either in the half-open central position or in the most open region of the central area (Gimson, 1970:124). This vowel is difficult since there is no single letter can stand for this vowel. It is produced in final positions so short with the mouth open than in other positions. It presents difficulty to Arabic speakers who tend to use a "spelling pronunciation" or when in final position often substitute /ɪ/ or /a/ in words such as butter /bærə/ (Tiffen, 1976:29)

k) /ː/: It is a mid central unrounded long vowel. It is not very close in quality to any of the other vowels and usually it seems rather obscure and indistinct to the foreign learner. It is produced when the central part of the tongue is raised to about 'mid-way' positions. The height of the tongue is about half-way between 'open' and 'close' and the highest of the tongue part is the central part which is culminating at the junction between 'front' and 'back'. The lips are spread.
1) /ɨ / : It is a lower variety of the mid central vowel. It is articulated with a separation of the jaws and with the lips are neutrally open. It is produced when the height of the tongue is half-open and the highest of the tongue part is the fore part of the back. It occurs between /ː/ and /œ/. The nearest Arabic vowel to it is /i/ 'fatha' in word like /fam/ (فم) (mouth). However, the English vowel is much stronger (Ibid.). Arabic speakers usually confuse between this vowel and the English vowel /ə/.

(2) Diphthongs: The diphthong is defined as a glide from one vowel to another, and the whole glide acts like one of the long. O'Conner (1980:85-86) classifies the diphthongs into three groups:
   1. Those end in /a/ which are /a, a, eI, aI, I/
   2. Those end in /I/ which are /eI, aI, I/
   3. Those end in /ə/ which are /lə, eə, ə/

   According to Roach (2002:21) diphthongs are composed of closing and centering diphthongs. The closing diphthongs /a, a, eI, aI, I/ are also known by Gimson (1970:138) as falling diphthongs since most of the length and stress is concentrated on the first element and closing since they glide towards a closer vowel. It is a glide from a relatively more open towards a relatively more close vowel is produced. Here, the tongue moves closer to the roof of the mouth as well as rounding movement of the lips. The centering diphthongs are /lə, eə, ə/ which are a glide towards the /ə/ 'shwa' vowel. It is important to say that the first part of the diphthong is much longer than the second part, for example, most of the diphthong /aI/ as in word 'eye' /aI/ consists of /a/ vowel and only in about the last quarter of the diphthong does the glide to /I/
happens, the loudness of the sound decreases. Besides, the centering diphthongs have also a falling feature except in some exceptional cases of / Iә, ә/ (Gimson, 1970: 142). However, there are eight diphthongs in RP. The following diagram contains the English diphthongs. The dots show the starting points and the arrows show the direction in which the diphthongs proceed.

Figure (7) The English Diphthongs

Jones (1957:98-125), AL-Hamash (1964:64), Gimson (1970: 130-146) and O’Conner (1980:84-86) describe the following groups of the diphthongs as follows:

a) /eI/: This diphthong is a glide smooth from /e/ to / I/. It is a mid front unrounded glide. It starts at about the English /e/ and moves in the direction of / I/ as shown in Fig.(7). AL-Hamash (1976:91) indicates that this diphthong is similar to the Arabic diphthong /aj/ as in /bajt/ ( البيت) (home).

b) /al/: It is a glide smooth from / a/ to / I/. It is a low front unrounded glide. It is produced when the height of the tongue is low and the part of the tongue raised is the front.
c) /I/: It is a glide smooth from /:/ to /I/. It starts with a vowel half-way between /:/ and /:/ and ends near /I/. The tongue movement extends from back to centralized front and the lips are neutral.

d) /ɘ/: It starts with /:/ and ends in /\. It is a mid back rounded glide. The English diphthong /ɘ/ starts with a tongue-position in advance of and somewhat lower than that of cardinal vowel no.(7)/o/ and a lip-position of medium rounding in which the speech organs then move in the direction of /u/. The height of the tongue is a little nearer to 'half-close' than to 'half-open' and the part of the tongue raised is the fore part of the back. The lips are slightly rounded. Arabic speakers are often confused between this vowel and the long vowel /:/ and such words like no /nɘ/ and go /gɘ/ are pronounced as /n:/ and go /g:/.

e) /a/: It starts with /:/ and ends in /:. It is a low front unrounded glide. It is produced when the height of the tongue is low and the part of the tongue raised is the hinder part of the front. The lips are neutral. AL-Hamash (Ibid.:23) mentions that the nearest Arabic diphthong to it is /aw/ that can be found in words like /lawn/ (لون) (colour). The two diphthongs are different in spite of the seeming similarity. Such 'hidden' difference are often the sources of difficulty for speakers of Arabic learning English.

f)/Iɘ/: It glides from /I/ to /ɘ/. The starting point is a little closer than /I/. This diphthong is considerably rare in Arabic but it can be found in some words as in /hIɘ/ ( فهي) (she). English
foreign learners are faced difficulty in distinguishing between this diphthong and the English diphthong /œ/.

g) /œ/:This diphthong glides smoothly from /æ/ to / / .The starting point of this diphthong is about cardinal vowel no.(3)/ε/. It is produced when the height of the tongue is half-open and the part of the tongue raised is the front. The lips are spread to neutral .

h) / œ/ :It starts from / / and glides to /œ/.RP speakers may also use /œ/ instead of / œ/ in words like poor/pœ/, surely /œl/.Other words like fewer , bluer, etc. are usually pronounced with both / œ/ or / œ/ like /fœ œ/ or /fœ œ/. This diphthong starts at English vowel no.(8)/ / and ends at a sound /œ/. It is a falling diphthong. It can not be found in Arabic but it is heard in such words like /h œ/(ھﻮ)(he).

(3) Vowel Sequences (Triphthongs): The third category that O’Conner (1980:88) used in his classification of the vowels is the vowel sequences which are also called 'triphthongs'. They refer to one vowel (or diphthong) follows another and they are produced smoothly with a glide between them. There are five sequences end in /œ/ which are /alœ, a œ, elœ, œ œ, ɵœ /. The first two sequences are very common whereas the last three sequences are less common . Christopherson (1956:84) represents the tongue position for the triphthongs /alœ, a œ, elœ/ in the following diagrams:
Furthermore, there are other vowel sequences that can be summarized as follows:

i. As the diphthong when followed by another vowel like in the word 'going' /goʊ ɪŋ/.

ii. when /iː/ and /uː/ are followed by /ə/ as in 'freer' and 'bluer'. These can be pronounced like /friːə/ or /frIə/ and /bluːə/ or /bləʊ/ respectively.
iii. Vowel sequences that are found within words and between words as in 'beyond' /bI nd/ and 'go out' /gɔ t/.

It is worth mentioning that one important feature which can apply for the English vowels is that the voiceless consonant sounds make the preceding vowels shorter and the voiced consonant sounds make the preceding vowels longer, e.g., the long vowel /u:/ in 'loose' /lu:s/ and 'lose' /lu:z/ should pronounce longer in the first word than the second one since the former is followed by voiceless and the latter is followed by voiced consonant. Similarly, the voiceless and voiced consonant sounds have also an effect on the length of both the vowel and the nasal consonant, e.g., the short vowel /I / and /n/ sound in 'since' /sIns/ before voiceless sounds are pronounced shorter than the short vowel /I / and /n/ sound in 'sins' /sInz/ before voiced sounds (O'Connor, 1980:49-50). This feature can not be found in Arabic language system.

For many of the details presented in this section, the researcher is greatly indebted to Daniel Jones (1957).

1.3 Arabic vowel Sounds

The most important fact is that human apparatus can produce various possibilities in the number and variety of sounds about the pronunciation of any language in general. So, by using the same organs of speech used in producing English sounds but slightly in different ways, one can produce the standard Arabic Vowels.

Vowels are called differently. The major ones are 'AL-harakat' (الحركات), As-Sawa'at ('الصوائم), 'huruuf AL-'illah' (الحروف العلية), and Ath-Thawa'ab' (النواتب). Figure (10) is a diagram showing the parts of the tongue in used in producing the Arabic vowels.
Consequently, there are six vowels and two diphthongs in SA. Three of them are short which are /a, i, u/ 'fatḥa, kasrāh, ammā' . They are written as marks over or below the consonant or a long vowel which are / ٦, ٦, ٦ / respectively. The other three are long vowels and they are written by doubling the same short vowels /aa, ii, uu/. It has been stated that Arabic vowels are voiced sounds produced with no obstruction or constriction in the mouth. According to Ibn Jinnī, who has called first the vowels as 'hurūf AL-Madd Walleen' and then are rendered as the sounds of lengthening and prolongation that can be short 'harakāt' or long vowels 'hurūf ALMadd'. He defines AL-Harakat as "the element which if occurs between two identical consonants, it will prevent them from being doubled". Moreover, they are called 'harakat AL-Madd Walleen' since they are represented by the letters / ٠ / as in /baab/ (باب) (door), /ja'a/ (ياء) as in /jatruk/ (يترك) (he leaves), and /waaw/ (و) as in /ruuḥ/ (روح) (soul). One important thing should be mentioned here is that these letters have the same letters of long vowels. Each may stand for a consonant and a vowel, for example / baah/ (اباه) (his father), /jurīd/ (يريد) (he wants), and

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1 Ibn Jinnī is an ancient great Arabic linguist
/waduud/ (ودود) are consonants while /aa,ii,uu/ are vowels though they are represented by the same letters in Arabic orthography (Al-Na'aemy, 325:1980). Furthermore, AL-Ani (1970: 11 ) in acoustic study of the Arabic vowels has found that long vowels are twice the length of their short counterparts. The most distinctive feature of the Arabic vowel is the relative length and that long vowels should be represented by doubling the same symbole, i.e, (vv). Gemination is a term used by some writers like Nasr (1967:9) to indicate the relative length of the vowels. Thus, short vowels here are geminates of the same vowel. Bisher (1975:85-86) states that in Arabic there are two cases of 'waaw' and 'jaa ' either they are considered consonants (semi-vowels) or vowels. On one hand, they are consonants if they are followed by a vowel or unvoweled consonants and preceded by the vowel 'fatha', i.e, consonant with /sukuun/ as in /walad/ (ولد) (boy), /jalid/ (يولد) (give birth to), /haw/ (حوض) (tank), and /bajt/ (بيت) (home) respectively. In this case they have the same structure and function of the consonants. On the other hand, they are similar to vowels because they have the same auditory sonority strength and they are called the letters of prolongation as in / d uu/ (ادعو) (pray) and / rmii/ (ارمي) (throw). This is why they are called semi-vowels because they sometimes function as consonants and vowels. In this respect, AL-Moosawy (2007:99) describes the unvoweled 'jaa ' when the front of the tongue is raised more than short kasrah /i/ towards the middle of the palate and this forms a narrowing in which the air passes through it causing a slight friction. In the case of unvoweled 'waaw' , the back of the tongue is raised more than the ' short amma' and this forms a narrowing in which the air pases through it causing a slight friction. This is why both unvoweled 'jaa ' and 'waaw' are called semi-vowels.
Al-Sa’aran (1962:184) and Nasr (1967:4) classify the Arabic vowel sounds according to three criteria (1) frontness and backness (2) closeness – openness (3) lip-position.

1) Frontness and backness: they indicate which the tongue part will raise in the production of the vowels. In this way, vowels are front, back and central vowels.

2) Closeness-openness: they indicate how far up or down that part of the tongue moves. Thus, Arabic vowels are close, half-close, half-open, and open vowels.

3) Lip-position: It refers to the shape of the lips. So, Arabic vowels are spread, rounded, and neutral.

Accordingly, the Arabic vowels are described according to three criteria as the following:

a) /a/ 'fatha': It is a low front open rounded vowel. The lips are spread. Al-Moosawy (2007:91) and Abdul Jalil (1998:203) indicate that this vowel is produced when the tongue is straight in the mouth with a slight height in the front of the tongue.

b) /i/ 'kasrah': It is a high front close unrounded vowel. It is produced when the front of the tongue is raised towards the middle of the palate. The lips are spread.

c) /u/ 'amma': It is a high close back rounded vowel. It is produced when the back of the tongue is raised towards the palate.

d) /aa/ 'alif': It is also known as the 'long fatha' or 'extended alif'. If 'fatha' is extended and takes much time in its
production, it is called the 'long fatha'. It is usually the long fatha /aa/ is longer than short fatha /a/.

e) /ii/ 'jaa /ii/ : It is called 'the long kasrah' or 'extended jaa '. If the 'kasrah' is extended and takes much time in its production, it is called the 'long kasrah'. It is usually that the long kasrah /ii/ is longer than short kasrah /i/. It is found that the English long vowel /i:/ is very close to the Arabic vowel /ii/ but the former is longer than the latter.

f) /uu/ 'waaw' : It is called the 'long amma' or 'extended waaw'. If the 'amma' is extended and takes much time in its production, it is called the 'long amma'. It is usually that the 'long amma' is longer than the 'short amma'. This vowel is approximately equivalent to English long vowel /u:/ but it should be produced with greater tension and stronger rounding and protrusion of the lips as in the word /zajtu:n/ (زيتون (olive)).

AL-Hamad (2002:155) assures that the major number of the Arabic vowels are three which are /fatha, kasrah, amma/ whereas the quantities number of these vowels are six. Here, the quantity feature means the relative length between the short and long vowels. The difference between them can be seen in the opening amount of the mouth, for example, /alif/ in /kaatib/ (writer) is produced with more opened lips than /fatha/ in /kataba/ (he wrote). Besides, some writers like Dr. Maslooh (1980:244) cited in AL-Hamad (2002:155-156) illustrates that the quantitative difference between 'fatha' and 'alif' is less clear than 'kasrah' and 'jaa', 'amma' and 'waaw'. Conversely, AL-Hamad (2002:155)
assures that the quantitative difference of 'fatha' is more clear than 'kasrah, jaa' and 'amma, waaw'.

It is interesting to note that fortunately Arabic Aleen sounds (short vowels) do not differ in their way of pronunciation as it is explained in the English sounds. The length of the Arabic sound does not affect its production or pronunciation but it is pronounced similarly wherever it is lengthened or shortened (Anees, 1961:131). This can be seen very clear in the description of Arabic and English vowels. The Arabic long vowels are twice of the short vowels and if the short vowels are extended they take much time in their production and the tongue and lips are held absolutely steady from start to finish, i.e., Arabic long vowels are pure. Conversely, English long vowels differ in their way of production from the short vowels like in the tongue position or height and the shapes of the lips.

In addition to that, there are two diphthongs in SA which are /aj/ and /aw/ as in /bajt/ (بيت) (home) and /haw/ (حوض) (tank) respectively. The diphthongs are also called 'المزدوج' in Arabic. Nasr (1967:41) defines the Arabic diphthong as two sounds that are combined together to make a single syllable. It is made by one impulse of the breath. Also, the Arabic diphthong is described as "a sequence of two vowels that can be found in one syllable" (AL-Hamad, 2002: 155). The diphthongs are longer than the short and long vowels because of the time they take to glide from the first vowel to the next (Nasr, 1976:41).

It is worth mentioning that some phoneticians like Bisher (1975:86) refuse the idea that there are diphthongs in SA and that both 'waaw' and 'jaa' in /haw/ and /bajt/ should be not considered as a part of diphthongs and any diphthong must be composed of
one unit that can not be found in the two previous words because they are composed of two separate units which are the vowel plus consonant: /haw/ (حوض) → ٍٍ + waaw, /bajt/ (بيت) → ٍٍ + jaa

Al-Hamad (2002:156) adds that these diphthongs have the same function of the consonants when they are preceded and followed by a vowel, for example, the structure of the word /wa ada/ (وعاد) (he promised) has the same syllables of the word /kataba/ (كتاب) (he wrote) and (و) equals (ك). Similarly, the two words /bajt/ (بيت) (home) and /badr/ (بدر) (full moon) contain the same syllable of the word and (ب) equal (ب). Nevertheless, he concludes that one can not say that there are no diphthongs in Arabic but one can state that there are two cases of 'jaa' and 'waaw' either they are vowels or consonants and the two can be distinguished between them phonetically and phonology. Phonetically, they are produced freely without any obstruction in the air stream and they are consonants if they are produced with a slight friction passing through them. Phonologically, they are consonants if they occupy the same environment of the consonants as they are preceded and followed by a vowel otherwise they should be considered vowels. Nasr (1967:42) describes the Arabic diphthongs as the following:

1) /aj/ : this diphthong starts in the position of /ا/ and moves towards the position of /اI/. The first element is tense whereas the second is lax.

2) /aw/ : this diphthong starts in the position of /ا/ and moves towards the position of /ا/. The first element is tense whereas the second is lax.
1.4 Conclusion

In the light of the previous explanation of both English and Arabic vowel sounds, the researcher may summarize the findings as follows:

1. The English vowel system has twelve simple vowels, eight diphthongs, and five triphthongs (vowel sequences). On the contrary, Arabic vowel system has only three short vowels with their long counterparts and two diphthongs. The following table shows the vowel system of English and Arabic language:

<table>
<thead>
<tr>
<th>RP Vowels system (25)</th>
<th>SA Vowels System (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simple Vowels (12)</strong></td>
<td><strong>Diphthongs (8)</strong></td>
</tr>
<tr>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>1./a/</td>
<td>/a:/</td>
</tr>
<tr>
<td>2./i/</td>
<td>/i:/</td>
</tr>
<tr>
<td>3./u/</td>
<td>/u:/</td>
</tr>
<tr>
<td>4./e/</td>
<td>/e:/</td>
</tr>
<tr>
<td>5./ә/</td>
<td>/ә:/</td>
</tr>
<tr>
<td>6./ә/</td>
<td>/ә:/</td>
</tr>
<tr>
<td>7./u/</td>
<td>/u:/</td>
</tr>
</tbody>
</table>

It seems, throughout looking at the above table, that English language system has many more vowels, diphthongs and triphthongs than Arabic language system and this is why most of...
the English foreign learners find it difficult to learn the English vowels.

2. Arabic short vowels are indicated by signs which put on to or below the consonants whereas the English short vowels are indicated by symbols which have their full place and independent existence in English alphabet and constitute integral part of the English words.

3. The vowels of the two languages are described and classified according to the same variables (1) the front-back position of the tongue (2) tongue height (3) lip-position but the English language has also an addition variable which is the position of the soft palate in which the soft palate determines whether the vowel is oral or nasal. Oral and nasalized vowels can occur in English whereas the oral vowels can only occur in Arabic language. All the vowels in English and Arabic language are voiced and are produced with a vibration in the vocal cords.

4. Throughout investigating the English and Arabic vowels, the researcher has found out that there are no exact correspondences between the two languages since any language varies from one speaker to other speaker and influenced by his/her native speaker. Therefore, any comparison between English and Arabic vowels is at least an approximation study and intends only as a general guide to help English foreign learners in a better understanding of the pronunciation of both languages. In this respect, the major differences and approximation similarities between the two languages can be stated as follows:

   1) It seems that the English vowels /ɪ/, ː, e, æ, ə, ə/ are not found in Arabic language but the rest are approximately the same in both languages with a little difference.

   a) The two English vowels /ɪ/ in 'sin' /sɪn/ and /iː/ in 'seen' /siːn/ are similar to the two Arabic vowels /i/ 'kasrah' in /sɪn/ (سن) (tooth)

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and /ii/ 'jaa' in /siin/ (سّين) (the letter S) respectively except that the former is shorter than the Arabic vowel /i/ 'kasrah'.

b) The two English vowels /i/ in sun /sun/ and /æ/ in 'father' /fa:ðə/ are somewhat similar to the two Arabic vowels /a/ 'fatha' in /dam/ (دم) (blood) and /aa/ 'alif' in /saara/ 'he walked' respectively with a little difference in which the Arabic short vowel /a/ 'fatha' should be produced more strongly than the English one.

c) The two English vowels /t/ in 'put' /pət/ and /u:/ in 'food' /fu:d/ are very close to the two Arabic vowels /u/ 'amma' in /kutub/ 'books' and /uu/ 'waaw' in /zajtu:n/ (زيتون) (olive) respectively. Further, the Arabic long vowel /uu/ 'waaw' should be produced with a greater tension and stronger rounding and protrusion of the lips than the English one.

The following diagram includes the English and Arabic vowels. The vowels inside circles represent the approximation similarity of the vowels between the two languages.
2) The English diphthongs /aɪ, ɪ,ə, ø, uə/ have no equivalent Arabic vowels except that the two diphthongs /ɪ, uə/ can be found in some rare Arabic words like /hɪ/ (ھی) and /huə/ (هو). Besides, the two English diphthongs /eɪ / and /aɪ / are very similar to the Arabic diphthongs /aj/ and /aw/ but the latter has a little difference which is called by some like Khalil AL-Hamash as "hidden difference" that has an important role in causing difficulty for English foreign learners to learn English vowels. The following diagram shows the approximation similarity of the diphthongs between the two languages.

3) Concerning the diphthongs, English language has triphthongs which can not be found in Arabic language.

5) Unlike English vowels, Arabic vowels are not different in their criteria when they are lengthened, e.g., the long vowels are twice the length of their short counterparts with the same criteria and this is why they are called pure vowels. The English long vowels have
different criteria from their short counterparts, e.g., there is a difference between the two vowels /a/ and /u:/ since the former is produced with a tongue position which is almost advanced and the lips are fairly rounding whereas the latter is produced with the tongue position which is rather lower and more forward and the lips are close rounding. Besides, the height of the tongue of the short vowel /a/ is just above half-close and the highest of the tongue part is the front part of the back whereas the height of the tongue of the long vowel /u:/ is nearly close and the highest of the tongue part is the back.

6) The English vowels are influenced by the neighboring sounds. The vowels are shortened when they are followed by the voiceless consonants and they are lengthened when they are followed by the voiced consonant sounds, for example, the long vowel /i:/ in 'leaf' /liːf/ is produced longer than the long vowel /i:/ in 'leave' /liːv/ since the former is followed by voiceless consonant and the latter is followed by voiced consonant whereas the Arabic vowels are not influenced by the neighboring voiceless and voiced consonant sounds.
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