



## Segmental Analysis of English and Arabic Vowels

Dr. Dalal Alfadhil Attaher Salheen\*

English Department, Faculty of Arts, Bani Waleed University, Bani Walid, Libya

### تحليل مقاطع الحروف المتحركة في اللغتين العربية والانجليزية

د. دلال الفضيل الطاهر صالحين\*

قسم اللغة الانجليزية، كلية الآداب، جامعة بنى وليد، بنى وليد، ليبيا

\*Corresponding author: [dalalsalheen@bwu.edu.ly](mailto:dalalsalheen@bwu.edu.ly)

*Corresponding author	<a href="mailto:dalalsalheen@bwu.edu.ly">dalalsalheen@bwu.edu.ly</a>	*المؤلف المراسل
تاريخ النشر: 2024-09-05	تاريخ القبول: 2024-09-01	تاريخ الاستلام: 2024-07-22

#### Abstract:

When learning another language, learners must consider various factors that can either support or conflict with the learning process. Regarding the sound system, particularly the differences between English and Arabic, Arabic learners face challenges as some sounds in English do not exist in Arabic, and vice versa. Notably, the vowel systems of the two languages differ significantly, and this discrepancy needs to be recognized and addressed by Arabic learners of English. This paper studies the vowel sounds of English and Arabic, highlighting the equivalents between the two languages. Based on the existing literature, there is a great difference between vowels in English and Arabic. The difference lies in quality and in quantity, as each language has its distinctive features of articulation. This paper suggests that Arabic learners of English must consider the differences at the early stages of language learning, as this would improve their perception and production of sounds. Subsequently, communication would be more effective, which is the goal that drives all language learners from the very start.

**Keywords:** Vowels, English, Arabic, British Monophthongs, Diphthongs.

#### المخلص

عند تعلم لغة أخرى، يجب على المتعلمين النظر في عوامل مختلفة والتي من شأنها أن تدعم أو تتعارض مع عملية التعلم. فيما يتعلق بنظام الاصوات، وخاصة الاختلافات بين الإنجليزية والعربية، يواجه متعلمو اللغة العربية تحديات حيث أن بعض الأصوات في اللغة الإنجليزية لا توجد في اللغة العربية، والعكس صحيح. والجدير بالذكر أن أنظمة الحروف المتحركة في اللغتين تختلف بشكل كبير، ويجب على متعلمي اللغة الإنجليزية من العرب الاعتراف بهذا التناقض ومعالجته.

تدرس هذه الورقة أصوات الحروف المتحركة في اللغة الإنجليزية والعربية، وتسلط الضوء على المتشابهات بين اللغتين. استناداً إلى الأدبيات السابقة، هناك فرق كبير بين الحروف المتحركة في اللغة الإنجليزية والعربية. يكمن الاختلاف فيما يعرف بالجودة وهو طريقة نطق الاصوات وعددها في كل لغة، حيث تتمتع كل لغة بسمات نطق تميزها عن غيرها. تقترح هذه الورقة أن متعلمي اللغة الإنجليزية من العرب يجب أن يأخذوا في الاعتبار الاختلافات في المراحل المبكرة من تعلم اللغة، لأن هذا من شأنه أن يحسن إدراكهم وإنتاجهم للأصوات. وبالتالي، سيكون التواصل أكثر فعالية، وهو تحقيق الهدف الذي يدفع جميع متعلمي اللغة منذ البداية.

**الكلمات المفتاحية:** الحروف المتحركة، اللغة العربية، اللغة الانجليزية، الحروف المتحركة الأحادية في اللهجة الإنجليزية البريطانية، ثنائيات الحروف المتحركة.

## 1. Introduction

Acquiring another language is a complex and challenging task, requiring mastery of multiple layers. Learners need to become proficient in areas such as phonetics, phonology, semantics, syntax, and pragmatics. For English language learners (ELLs), achieving native-like proficiency in all these aspects of the target language (TL) is a significant hurdle. Regarding this discussion, several theories have emerged to explain the process of language acquisition and to develop effective language inputs. These include the Motor Theory (MT), the Direct Realistic Theory (DRT), the Perception Assimilation Theory (PAM and PAM-L2), the Contrastive Analysis Hypothesis (CAH), and the Speech Learning Model (SLM). These theories provide a framework for explaining the process of language learning, making sense of it, and identifying potential solutions for any obstacles encountered by learners.

The global population of ELLs is rapidly increasing. For instance, between the 1994-1995 and 2004-2005 school years, the number of ELLs rose by over 60% [23]. This significant growth highlights the importance of speech intelligibility in second language (L2) learning and acquisition [10, 17]. In this regard, scholars emphasize the crucial role of vowels in speech intelligibility, suggesting that they have a greater impact than consonants [15, 13, 14].

Therefore, this study focuses specifically on vowel systems, examining the differences between English and Arabic. The primary objective is to identify equivalent sounds in systems, highlighting any discrepancies and explaining how sound changes can affect word meaning. The study further investigates how these dissimilarities might impact learners' communication. The significant differences between English and Arabic provide a rich context for this examination. The findings of this study aim to raise awareness among Arabic EFL learners and offer valuable insights into the challenges they face.

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## 2. Why vowels?

Apart from the consonant sounds, which are similar in many languages, vowels are the core of this study for several considerations. At first, vowels are classified as any sounds created without interference, or "blocking" from articulatory organs such as tongue, teeth or lips. This lack of obstruction creates the open vowel sound. However, vowels are considered an essential element when it comes to communicating with others in the target language. Particularly, vowels are classified as the building blocks of any language; they bear numerous aesthetic qualities to the language such as melody, rhythm, intelligibility, as well as establishing the actual core of communication [14]. Regardless of the fact that vowels normally take advantage of the consonants while produced, they are produced with higher concentration and longer continuation than consonants. Unlike consonants, vowels involve different articulatory gestures such as less vocal band shrinking and different tongue muscle properties [9, 7].

Of special concern is that the phonological inventories contain fewer vowels than consonants in most languages, including English TL and Arabic NL. Why vowels? Because vowels are tending to be more volatile, not only in the case of learning another language but also among dialects within the native language. This makes vowels an ideal ground for better evaluation of any claim about L2 learning. Therefore, this is a vowel-centered research with more focus, in depth, on the difference between Arabic vowels and English vowels from a non-native (Libyan) perspective.

## 3. Comparative Structure of English and Arabic Vowels

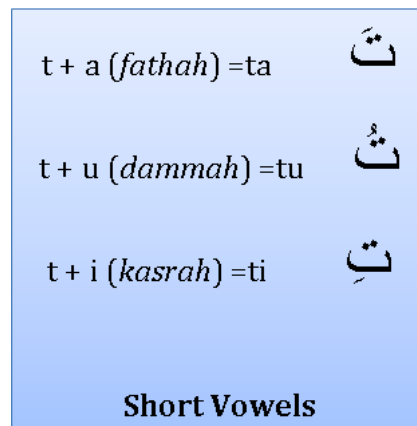
To help Arabic language learners of English understand the sound systems in both languages, this document clarifies the vowel inventories of Arabic and English, highlighting vowel quality and quantity, respectively.

### a. The Arabic Vowels Inventory

Arabic, a Semitic language, is not only spoken in the Arabian Peninsula and North African countries as a main language, but is also used by more than 300 million people from Asia to the Atlantic Ocean [18, 22]. As early as the 7<sup>th</sup> and 8<sup>th</sup> centuries, with some references even alluded to as early as the 4<sup>th</sup> century, Arabic has been used extensively and because of that its alphabet has been adopted by many languages such as Urdu, Persian, Hebrew, Turkish, Slavic, Spanish, Malay, Berber, Swahili, and Sudanese. However, it is considered a conservative and gradually changing language [24, 25].

Pointing out the Arabic vowel portfolio is a debatable, confusing topic. Versteegh and Versteegh [6], stated that there are just three vowels in classical Arabic (a, i, and u) which are similar to the short English vowels (a, i, and u), as Figure (1) shows. The long vowels are just combinations of short vowels with a glide which tend to be categorized and called (*h.arf al-lin wa-l-madd*). Another reference gives a clearer explanation for a vowel

inventory in Arabic, where it is indicated that there are exactly three kinds of vowels. The first one refers to the three vowel letters (/a/: Ailf, /u/: Waw, and /i/: Ya'a), the second one represents what is a so-called "Hamza" (ء), which is a small sign that could be put on, under or beside one of the vowel letters, and the last one is the vowel marks [3]. However, the vowel marks are essential for making sure the meaning of a word is accurately absorbed, as Table (1) displays. These marks, which are called 'Harakat' or 'Tashkeel', are named 'Fathah', 'Dmmah', 'Kasrah', and are positioned below or above letters as a facilitator for making a sound in a way similar to English vowel sounds /a/, /u/, /i/ [3].



**Figure 1:** Schematic representation of sound marks in Arabic

Necklace	عَقْدٌ
Decade	عَقْدٌ
Contract	عَقْدٌ
Held	عَقْدٌ
Complicated	عَقْدٌ
Knots	عَقْدٌ

**Table 1:** The effect of vowel marks in word meaning.

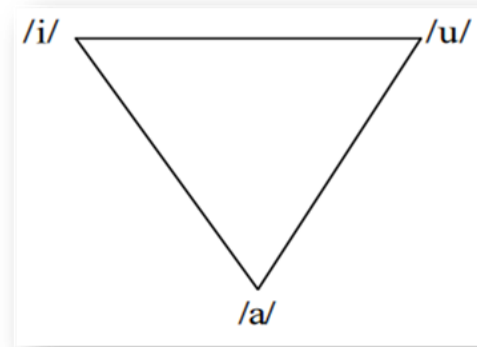
A broader division of vowel system in Arabic has been identified, which provides a phonetic guide for better understanding of Arabic pronunciation. Besides being similar to other references indicating the three vowel letters (/a/: Ailf, /u/: Waw, and /i/: Ya'a), and the vowel marks: *Fathah*, *Dmmah*, *Kasrah*, other concepts are mentioned as part of vowel classification; these are *Maddah*, *Khanjariyah alif*, *Alif waslah*, *Shaddah*, *Sukun*, *Tanwin*. However, most resources state that there are three short vowels /i/, /a/, /u/ and accompanying long ones /i:/, /a:/, /u:/ [1, 16].

Consequently, it is of vital knowledge to take into consideration L1 phonology in order to understand how L2 adults categorize and absorb L2 phonology. It is vital and necessary to be aware of the interplay role with L1 and L2. Just as there is a variety of English, there are different dialects of Arabic spoken across the Arabic world. However, the reference criteria for this study will be the Modern Standard Arabic (MSA), as British English (BE) is the standard for this study. In many languages, there are two main phonetic parameters used to describe vowels in terms of different phonological aspects: vowel quality and vowel quantity. The term quality is used to point out differences in the place of articulation, tongue position in the vocal tract, the size of the stricture, the shape of lips, and whether the vowel is nasalized or not. Quality differences are seen in the acoustic signal in different spectral patterns for different vowels. In contrast, vowel quantity is a concept which refers to

the phonological distinct length, as this description is part of its phonemic (i.e. vowel) identity. In other words, the concept here simply states whether the vowels are short or long [11].

### I. Vowel Quality

Describing vowels of any of the worlds' languages, phoneticians normally go directly to consider the acoustic concepts and how elegantly they articulate the description, as cited by American researcher G. Oscar Russell in Newman and Verhoeven [16]. This is considered correct for the basic general quadrilateral depictions of vowel systems of languages over the entire world, including the Arabic language. Describing Arabic vowels generally starts with the famous vowel 'triangle' of the 'fundamental' vowels as named by Gairdner in Newman and Verhoeven [16]. Gairdner, who created a modern Arabic phonetic, also put the Arabic vowels within what is known as the Cardinal Vowel diagram. See Figure (2).



**Figure 2:** Classical Arabic vowel triangle /i/ /u/ /a/

The triangle approximately represents the physical placement of vowels in regard to points made by the pioneer Arabic philologists like Sibawayh – the nom de plume of Abu Bishr Amr b. Uthman b. Qanbar (d. late 8th c.) – and Ibn Jinni (floruit 10th c.) in relation to input processing of vowels as it specifies to tongue situation. As Mitchell mentioned in Newman and Verhoeven [21], the vowel system of either the classical Arabic (CA) or the Modern Standard Arabic (MSA) can be described as one of three vowel units: open, closed front, closed back.

### II. Vowel Quantity

In Arabic, all three vowels have both characteristics; short and long. The long vowels are termed as: /a: / *Ailf*, /u: / *Waw*, and /i: / *Ya'a*, whereas the short ones are called /a / *Fathah*, /u/ *Dammah*, and /i / *Kasrah*. Table (2) introduces vowels quantity in Arabic, and gives a clear classification for the three.

The six vowels fall into two groups:			
(3) Short and (3) long as follows			
<u>Short</u>		<u>Long</u>	
◌َ	a	ā	aa
◌ُ	u	ū	uu
◌ِ	i	ī	ii

**Table 2:** Vowel Quantity in Arabic

## b. English vowel Inventory

Before stating how many vowels there are in English, it is widely known that there are two main recognized “Englishes” in the world; British English (BE) and American English (AE). Under each, there are, as is the case of the Arabic language, different dialects and accent specialists for different regions. The question now is: how many vowels are there, and in the case of both Englishes do they have the same vowel sounds? According to Deterding [12], American English has fewer vowels than British English. Particularly, the vowel sound /ɒ/ does not exist in American English, instead the sound /ɑ:/ is pronounced. In addition, the sound /r/ is normally pronounced at the end in American English, unlike in British English where it can only exist before vowels. As a consequence, this would affect three diphthongs existing in BE: /Iə, eə, və/; these vowel sounds simply occur instead: /I, e, v/; However, the model English for this research is BE.

### I. Vowel Quality

Usually, with respect to the term “Phonetic quality”, the description of vowels are accompanying what is a so-called “vowel space”. Three dimensions need to be considered; two of them are labeled as high- low (or close-open), and front-back which are correlations of tongue and jaw place. The third is labeled as (rounded unrounded), which represents the lip shape [21]. Simply, each English vowel is vowel can be classified by the shape of the tongue and the lips when it is pronounced.

With regard to the high-low (close-open) feature, vowels are classified based on the vertical position of the tongue. A high vowel indicates the tongue is positioned high in the mouth, while a low vowel indicates the tongue is positioned low in the mouth. However, some vowels are pronounced with an intermediate tongue position. These vowels are described as ‘mid’, falling between ‘high’ and ‘low’. The front-back feature describes the horizontal position of the tongue. Vowels are classified as front, central, or back depending on whether the tongue is positioned towards the front, center, or back of the mouth. Finally, vowels are classified as rounded or unrounded based on the 10 shapes of the lips. Rounded vowels are produced with the lips rounded or pursed, while unrounded vowels are produced with the lips spread or relaxed [4]. Figure (3) and (4) illustrate the tongue position in the oral cavity for each vowel sound in English, as well as the corresponding lip shape.

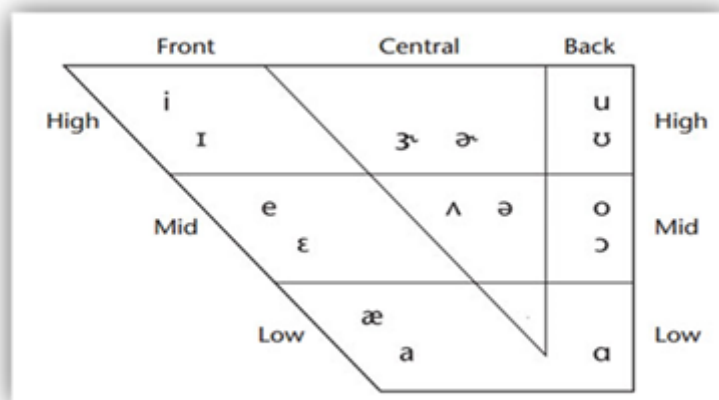


Figure 3: The tongue position in the oral cavity.

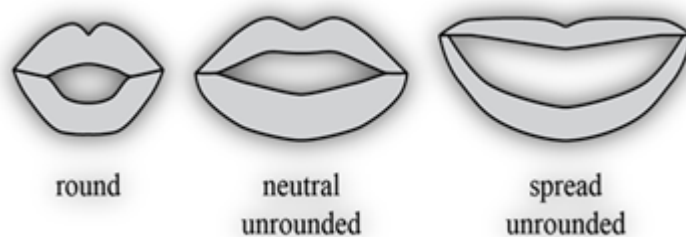


Figure 4: The shape of the lips during articulation.

## II. Vowel Quantity of English

As stated earlier, vowel quantity indicates the length of vowel, or the duration that it takes to be produced, which is greater for a long vowel than the same short vowel. The 11 long vowels are represented with a colon [:]. In English, out of twelve British monophthongs, there are five long vowels; the rest are the short ones. These are the long vowels in standard RP English: /i:/ as in sheep, /u:/ as in boot, /ɜ:/ as in learn, /ɔ:/ as in door, /ɑ:/ as in car. The short vowels with examples as well: /ɪ/ as in ship, /ʊ/ as in book, /e/ as in egg, /æ/ as in cat, /ʌ/ as in cup, /ɒ/ as in hot, and /ə/ as in mother. See Figure (5).

i:	ɪ	ʊ	u:
sheep	ship	good	shoot
e	ə	ɜ:	ɔ:
bed	teacher	bird	door
æ	ʌ	ɑ:	ɒ
cat	up	far	on

Figure 5: Schematic Display of British Monophthongs Vowels.

What is worth mentioning here, is that vowels affect the word meaning, especially if learners are not aware of the distinct properties of each one. Notice the difference between the meanings of these words, as Table (3) illustrates, with a single vowel sound difference:

Sheep	Vs.	Ship
/ʃi:p/		/ʃɪp/
Ten	Vs.	Tin
/ten/		/tɪn/
Fun	Vs.	Fan
/fʌn/		/fæn/

Table 3: The effect of vowel sound on lexical meaning.

### Conclusion

When Arabic learners start to learn English, they find differences between the two languages (Arabic and English), and this distinction is worth recognizing. The sound system, particularly vowel sounds, differs in terms of quality and quantity. With regard to vowel quality, describing English vowels involves three aspects: high vs. low, front vs. back, and rounded vs. unrounded. However, the Arabic vowels can be characterized as either: short or long, and the long ones are equivalent to /a:/ Alif, /u:/ Waw, and /i:/ Ya'a. Regarding quantity, Arabic and English vary greatly. Arabic has only 3 vowels which have two forms: long and short [2]. Yet, English has at least 12 monophthongs, 8 diphthongs, and 5 triphthongs.

The disparity in the sound system between Arabic and English is perplexing and leads to misunderstandings when Arab learners pronounce sounds inaccurately. On the other hand, the more learners distinguish the distinctive features of each vowel sound in English and the equivalent sounds in Arabic, the more competent users they can become. Vowels bear a notable weight, as the meaning of a word can be completely changed by a

single vowel. That is, vowel sounds have a big influence on how words are pronounced in a language, which can lead to misunderstandings. And communication relies on shared understanding; when misunderstanding occurs, thoughts are not conveyed effectively. Hence, gaining an understanding of the phonetic and phonological properties of vowels is essential to improving pronunciation, and to become a competent user of a language.

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