

***The vowels in the linguistic environment  
of a student in the university of Biskra***

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**Abstract :**

This article shows the different vocalic systems of the languages present in the environment of a student in Biskra, that's to say Arabic – classical and dialectal- , French and English. The Amazigh vocalic system is not presented here because this language is not shared by all the students. An articulatory description, completed by acoustic features, is given for the different vocalic sounds .

**المُلخَص :**

هذه الدراسة تدور حول الأنظمة الصوتية المختلفة التي يتعرض إليها الطلبة بجامعة بسكرة ، وهي اللغة العربية (الفصحى واللهجة المحلية) ، والفرنسية وأخيرا الانجليزية. لن نتطرق إلى اللغة الأمازيغية لأنها ليست مستعملة من طرف جميع الطلبة. قد يرد وصف نطقي مدعماً بالخصائص الصوتية لمختلف الأصوات الصوتية المدروسة هنا.

**Introduction:**

When an Algerian child starts learning English he or she is in a state of diglossia: two different varieties of Arabic (dialectal and classic Arabic) are used according to well defined social situations. Fergusson(1959) (cited in Giglioli,1979) described diglossia as: "*a relatively stable language situation in which, in addition to the primary dialects of the language (which may include a standard or regional standards) there is a very divergent, highly codified (often grammatically more complex) superposed variety, the vehicle of a large and respected body of written literature , either of an earlier or in another speech community, which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation.*" The learner has already been in contact with a first foreign language which is French. French is taught in a formal setting from the third year of primary school- the case where English is chosen as a first foreign language is very rare, but this is not their first contact with the language. For historical reasons, the children are already familiar with French and even if they do not speak it fluently, their speech is interlarded with French words. (TV programmes interesting children are very often in French).

What is referred to as classical Arabic , the high variety of the language, is in fact a contemporary standard Arabic, a modernized version of classical Arabic which is the norm in use in all Arabic speaking countries today. The young pupil learns classical Arabic in a formal setting that means at school. This high variety of Arabic is used in schools, in mosques, on radio and TV programmes , in situations where preparation is possible but it is not the usual means of communication used in the every day life.

**I-The vocalic sounds in classical Arabic:**

Traditionally , and in comparison with French and English , Arabic is said to be "poor" in vowels. But when going deeper in the study of the vocalic system we can see that the range of vowel sounds is wider than what is represented visually. Classical Arabic counts three short pure vowels (*harakat*) with three corresponding long vowels.

**I-1. Short vowels :**

/a/ An open central vowel represented in writing by the diacritic above the consonant and called "fatha".

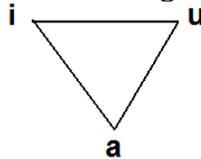
/i/ - a close front vowel- represented by the same mark this time below the consonant and called "kesra".

/u/-a close back vowel represented by the diacritic ' above the consonant and called "damma".

These names are given according to an articulatory feature: the position of the lips.

Fatha means open lips, kesra means spread lips, damma means rounded lips.

These vowels are shown in the famous triangle found in all the



descriptions of the Arabic language.

But these vowels, which are not always represented in spelling, may show considerable variation in their realizations. These variations in quality, which cannot be considered as different phonemes because the meaning of the word is the same whatever the vocalic sound used, are due to different factors:

- different geographical areas.
- different consonants adjacent to the vowel.
- different situations of word stress.

### **I-1.1.The short vowels and their variations**

#### -Variations of / a /

In Algeria /a/ is realised / ε / unless it is affected by a particular consonant :

- When preceded by an emphatic consonant (mufakhama) the point of articulation is drawn backwards and /a/ is pronounced / α / .

-The same phenomenon is observed when /a/ is adjacent to a uvular, pharyngeal or laryngeal consonant.

- eg: " قريب " /qɑ ri□b/ close or near  
" دعم " /d□ ε □ α mε / to support  
" نهر " /nɑ hr/ river

In certain words the consonants < ل > and < ر > may be "emphatic" and have the same effect on /a/

" الله " /α llα h/ God and " غادر " / √ α :dε rα / he left

In the morpheme < ال > in the word < الشمس > - the sun- / a / is obscured and reduced to /ə / a very short central vowel accompanied by the elision of the consonant < ل > /əʃ ʃ ε ms / .

#### -Variations of /u/

The pronunciation of /u/ is also affected when following an emphatic consonant or a guttural consonant

eg: apparition "ظهور" /ðohu:r/  
 bird "عصفور" /ʕ oʃ fu:r/  
 Ascension "صعود" /ʃ oʕ u:d/  
 Morning "ضحى" /d oħa /  
 The Coran "القرآن" /əlqorʔɑ :n/

The back of the tongue is lowered to the half close position and /u/ is performed /o/

#### -Variation of /i/

For /i/ the sound is nearer to the cardinal vowel number 2 (the front vowel /e/of <thé> when following the same consonants).

eg: "ظل" /ðel/ Shadow – "طب" /t eb/medecine – "صراع" /ʃ era:ʕ /fight – "ضلع" /d elʕ / rib – "قرد" /qerd/monkey – "قناع" /qenε :ʕ /mask

### I.2-Diphthongs

All the studies agree about the fact that there are two diphthongs in classical Arabic.

/ eI / "بيت" (home) and /aʊ / "قوص" (arch)

/ eI / is pronounced /aI/ in "صيف" (summer) because of "ص", an emphatic consonant.

/ eʊ / is found in in the variety of standard Arabic spoken in Algeria: زوج (pair)

/aʊ / being the pronunciation of the phoneme adjacent to an emphatic , a guttural consonant or the trill /r/: صوت (voice)

## II-Vocalic sounds in dialectal Arabic:

### II.1-Vowels:

As far as phonetics is concerned dialectal and classical Arabic cannot be considered as opposing languages in the traditional sense of the term because belonging to the same linguistic family.

Almost all the sounds existing in Classical Arabic also exist in colloquial Arabic and it is particularly true for the vowels and their variations.

/a/ in /ma/ mother

/ɑ / in /ra ħ/ he went away

/ε / in /gε l / he said

/ə/ in /məftε ħ / key

/u/ in /ljum/ today

/i/ in /ʒ ib/ bring

## II.2- Dialectal Arabic diphthongs:

/eI/ in /leII/ *night*

/ɑ I/ in /ʂɑ If/ *summer*

/aʊ / in /raʊ da/ *wheel*

/eʊ / in /leʊ xor / *the other one*

The diphthongs /eI/ and /ɑ I/ may be realized as /i:/, /aʊ / and /eʊ / as /u:/ . The word /leʊ xor / (the other one) may be heard /lɛ xor / .

## II.3-Quantity:

The length of vowels is very important in classical Arabic.

Length or quantity is a distinctive feature.

The short vowel /a/ or /ɑ / is opposed to the long vowel /a:/ or /ɑ :/ in pair of words such as :

طلب /t̤ɑ ləb/ *demand , request*  
طالب /t̤ɑ :ləb/ *student*

علم /ʕ aləm/ *flag*

عالم /ʕ a:ləm / *world.*

And we see that according to whether the vowel . – here in the first syllable- is short or long the word is given a different meaning .

The diphthongs are equivalent in length to pure long vowels that means twice the length of a short vowel .

## III-The French vocalic system:

The French vocalic system counts 16 vowels = twelve are oral and four are nasalized –( nasalized is more appropriate than "nasal"because in fact a small amount of air is expelled through the nose during the articulation , the other part escapes through the oral cavity .

### III.1-The oral vowels:

#### Articulatory features:

- /i/ in < lit> - *il-lit-joli*. It is articulated with the real front of the tongue raised in the close position. The lips are spread (cardinal vowel N°1 in Daniel Jones diagramme).

- /y/ *une , lune,pointu* .It is articulated with the front of the tongue raised in the close position.The lips are rounded .

- /e/ *été , mélange ,thé* . It is pronounced with the front part of the tongue raised in the half –close position. The lips are slightly spread (it is the cardinal vowel N°2 in the diagramme of Daniel Jones).

- / ε / *aide , elle , raide , pelle , mai* . The front of the tongue is in the half –open position (cardinal vowel N°3 in Daniel Jones diagramme ) and the lips are very slightly spread. Its variations : When belonging to an unaccented syllable followed by a stressed syllable containing a close vowel it is realised as the close vowel /e/.

- /a/ *avoir, lave, la*. The front of the tongue is in the open position. The lips are naturally open (cardinal vowel N°4 in Daniel Jones digramme).

- /  $\Phi$  / This front vowel is articulated with a part of tongue nearer to centre raised in the half-close position. The lips are rounded.

Found in "*eux*" (them), "*deux*" (two), "*heureux*" (happy).

- /  $\text{ə}$  / in "*le*": the definite article "the". The front of the tongue is a little bit retracted and raised between the half-close and half-open positions. The lips are slightly rounded.

- /  $\text{œ}$  / as in "*seul*" (alone).

In the following minimal pair / $\text{œ}$ / is opposed to /  $\Phi$  / "*jeune*" (young) "*jeûne*" (fast). A part of the tongue nearer to centre than to real front is in the half-open position. The lips are slightly rounded.

-The spelling <eu> is usually pronounced /  $\Phi$  / in a syllable of the type CV (an open syllable) as in "*veut*" (wants) and /  $\text{œ}$  / in CVC type syllable as in "*veulent*" (they want) Nevertheless certain exceptions must be mentioned: in a CVC syllable if the final consonant is /z/. The tongue is raised higher and <eu> is pronounced /  $\Phi$  /.

- / $\text{ɑ}$ / as in "*pâte*" (dough). This vowel is articulated with the back of the tongue in the fully open position with lips naturally open. It is the cardinal vowel N°5 in the cardinal vowel scale of Daniel Jones.

- / $\text{o}$ / for this vowel the back of the tongue is in the half-close position and the articulation is accompanied by a medium lip rounding. The sound is found in words such as "*eau*" (water), "*sot*" (silly), "*pot*", (pot). It is the cardinal vowel N°7. But this vowel becomes / $\text{ɔ}$ / in the word "*sol*" (floor), "*pote*" (friend). We hear again / $\text{o}$ / in "*jaune*" (yellow) and because of a regressive assimilation due to the consonant /z/ <o> is pronounced / $\text{o}$ / in "*ose*" (*dare*).

/  $\text{ɔ}$  / is articulated with the back of the tongue in the half-open position with more slightly rounded lips.

- / $\text{u}$ / as in "*doux*" (smooth). The back of the tongue is in the close position. The lips are closely rounded.

Acoustic features

|          | <b>F1</b>  | <b>F2</b>   | <b>F3</b>   |
|----------|------------|-------------|-------------|
| <b>i</b> | <b>250</b> | <b>2250</b> | <b>2980</b> |
| <b>e</b> | <b>420</b> | <b>2050</b> | <b>2630</b> |
| <b>ɛ</b> | <b>590</b> | <b>1770</b> | <b>2580</b> |
| <b>a</b> | <b>760</b> | <b>1450</b> | <b>2590</b> |
| <b>ə</b> | <b>570</b> | <b>1560</b> | <b>2560</b> |
| <b>u</b> | <b>290</b> | <b>750</b>  | <b>2300</b> |
| <b>o</b> | <b>360</b> | <b>770</b>  | <b>2530</b> |
| <b>ɔ</b> | <b>520</b> | <b>1070</b> | <b>2510</b> |
| <b>ɑ</b> | <b>710</b> | <b>1230</b> | <b>2700</b> |
| <b>y</b> | <b>250</b> | <b>1750</b> | <b>2160</b> |
| <b>Φ</b> | <b>350</b> | <b>1350</b> | <b>2250</b> |
| <b>œ</b> | <b>500</b> | <b>1330</b> | <b>2370</b> |

Oral french vowels  
(male speaker)

**III.2-The nazalized vowels**

French counts four nazalized vowels corresponding to four oral vowels. During their articulations the soft palate ,which was raised for all the oral vowels, is lowred so that a part of the air expelled escapes through the nazal cavity.

Articulatory features:

\_ / $\tilde{\text{ɛ}}$ / in "*intérieur*" (inside) , "*vingt*" (twenty) , "*ceinture*" (belt), "*étain*" (tin). It is articulated with a part of the tongue more retracted towards the centre than for / $\text{ɛ}$ / the corresponding oral vowel. The tongue is raised slightly below the half open position and the lips are naturally open.

\_ / $\tilde{\text{œ}}$ / in "*un*" (one), "*lundi*" (Monday), "*embrun*" (spray). The central part of the tongue more retracted towards the back is raised below the half open position with a slight lip rounding.

\_ / $\tilde{\text{ɑ}}$ / in "*antérieur*" (former) , "*tante*" (aunt) , "*temps*" (weather,time) , "*chantant*" (singing ). The real back of the tongue is in the fully open position. The point of articulation being more retracted than that of / $\text{ɑ}$ / .

The mouth is wide open and the lips naturally open.

\_ / ɔ̃ / in "ongle" (nail), "blonde" (fair-haired), "rond" (rounded). The back of the tongue is just below the half close position with a medium lip rounding.

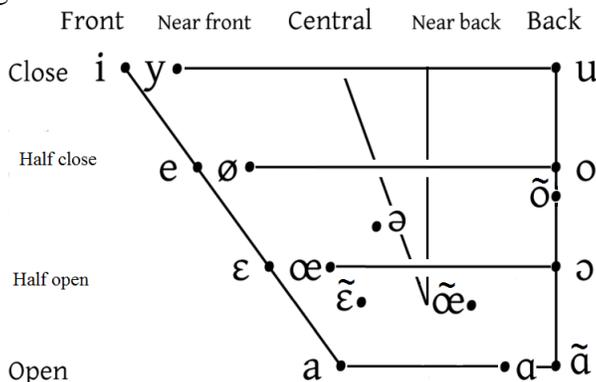


Fig.1- Oral and nasalized french vowels

Acoustic features:

|    | F1  | F2   | F3   |
|----|-----|------|------|
| ɔ̃ | 600 | 1470 | 2770 |
| œ̃ | 500 | 1280 | 2660 |
| ɛ̃ | 580 | 1090 | 2960 |
| ɑ̃ | 450 | 690  | 2940 |

French nasalized vowels

\_ Once we have described the French vocalic system we may say that most of the vowels are front vowels and give a clear resonance to this language .

All the vowels described belong to the Norm and the different varieties of French are not taken into account .

**IV-The English vocalic system:**

In RP the vocalic system is made up of twenty vowels classified as followed :

7 short pure vowels = /ɪ, e, æ, ʊ, ʌ, ʊ, ə/

5 long pure vowels = /i:, u:, ɑ:, ɔ:, ɜ:/

5 closing diphthongs : /eɪ, əʊ, aʊ, aɪ, ɔɪ/

3 centring diphthongs: /ɪə, ɛə, ʊə /

The pure vowels may be classified according to quantity and thus ,be identified as short or long vowels (a diphthong is equivalent in length to a pure long vowel) . But in English an opposition between two vowels is not based only on length.The vocalic quality is different. In

our study the classification retained is the one based on the part of the tongue involved in the articulation .

All the English vowels are oral , the soft palate being raised during their articulations .

#### **IV.1-Articulatory features:**

##### IV.1.1-Front vowels

\_ /i:/ "see" , "be" , "sea" , "piece" , "key" , "receive" , "machine". The front of the tongue is slightly below and behind the close front position. The rims making a firm contact with the upper molars The lips are spread.

\_ / I / in "sit" , "symbol" , "pretty" , "ladies" , "village" , "build" , "business" , "women". A part of the tongue retracted towards the centre is raised rims of the tongue make a light contact with the upper molars . The lips are slightly spread .

\_ /e/ in "set" , "breath" , "many" , "said" , "friend" . For /e/ the front of the tongue is raised between the half close and half-open positions . A light contact is made between the side rims and upper molars . The lips may be naturally open or slightly spread.

\_ /æ/ in "sat" , "plait".

The front of tongue is raised below the half open position . A very light contact is made between the side rims and the back upper molars . The lips are naturally open .

##### IV.1.2-Central vowels

\_ / ʌ / in "sun" , "son" , "country" , "blood" , "does" . for this short vowel / ʌ / the centre of the tongue is raised above the open position , the lips being neutrally open there is no contact between the tongue and the upper molars.

\_ / ə / in "alone" , "suppose" , "woman" , "oblige" , "possible" , "particular" and the weak form of the indefinite article "a" . It is articulated with the central part of the tongue raised between the half open and half close positions when the vowel is non final as in the examples given above .

In the words *mother* , *doctor* , *particular* , *colour*. The vowel is final and the tongue is in the half open position or a little bit lower.

The lips are neutrally open .

This short vowel occurs in unaccented syllables.

\_ / ɜ: / in "bird" , "heard" , "her" , "fur" , "word" , "journey" . During the articulation of this long R.P vowel the centre of the tongue is raised between the half-close and half-open positions with neutrally open lips .

IV.1.3- Back vowels

\_ /ɑ :/ in "father , branch , cart , heart , clerck , aunt" . For this long vowel ,the mouth is wide open and the back of the tongue is in the fully open position .

There is no contact between the rims and the upper molars . The lips are neutrally open.

\_ /ɒ / in "spot , what , yacht, cough , knowledge , because " . This short vowel is also articulated with a considerable separation of the jaws . the back of the tongue is in the open-position with no contact with the upper molars . the lips are slightly rounded.

\_ /ɔ :/ in "cord ,jaw ,bought ,daughter , water ,more , door , board , four " .

This long vowel is articulated with the back of the tongue raised between the half-close and half-open positions . There is no contact between the rims and the upper molars . The lips have a medium rounding .

\_ /ʊ / in "put , wolf, good , could" .

This short vowel is articulated with a part of the tongue between the centre and the back , raised above the half-close position. The rims make a slight contact with the upper molars . The lips are closely rounded.

\_ /u:/ in "food , lose , group , rude , juice , chew , shoe" .

The back of the tongue is almost in the close position for this R.P long vowel .There is a slight contact between the rims and the upper molars . The lips are closely rounded.

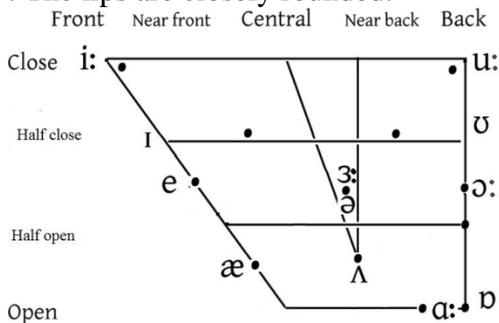


Fig.2 The English pure vowels.

**IV.2-Articulatory features of diphthongs:**

IV.2.1-Closing diphthongs:

\_ / eɪ / in "make , day , rain , eight , they , great".

For this glide the front of the tongue is first between the half open and half close positions then it moves upwards above the half close position. The lips are slightly spread.

\_ / aɪ / in "nice , my , light , height , pie , either , eye , bye" .

The starting point of this glide is a front open vowel then the tongue moves to articulate the front half-close vowel /ɪ/. The opening formed by the changes : they are first naturally open for /a/ then slightly spread for /ɪ/.

\_ / ɔɪ / in "toy , soil , voice" . For the articulation of the first element of this glide ,the back part of the tongue is in the half-open position. Then there is a movement of the front of the tongue towards the half close position accompanied by a movement of jaws. The opening of the lips changes from rounded to neutrally open .

\_ / əʊ / in " home , so , road , toe , know , though" .

First the centre of the tongue is between the half open and half close positions to articulate the starting point of this glide. Then the back of the tongue moves towards the half-close position for the second element /ʊ / . This glide is accompanied by a closing movement of the jaw with a change in the opening of the lips from neutral to rounded.

\_ / aʊ / in "house , town" .

For the articulation of the first element of this diphthong a part of the tongue advanced from true back is in the open position then moves towards the half-close position with a shift towards the centre. The lip opening changes fom neutral to slyghtly rounded.

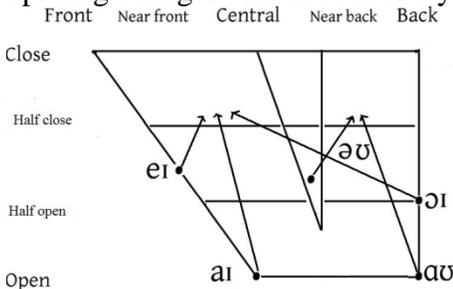


Fig.3 The English closing diphthongs.

IV.2.2-Centring diphthongs:

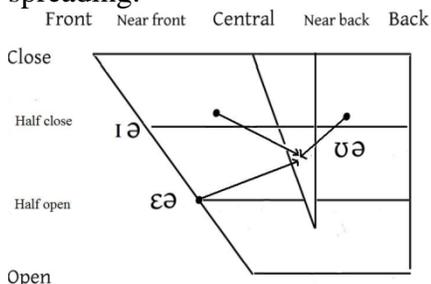
\_ /ɪə / in "deer , dear , here , idea , museum , pierce , theological".

For the first element /ɪ/ the front of the tongue (close to centre) is raised just above the half-close position . Then there is a glide towards the centre and towards the half-open position. They are slightly spread for /ɪ/ then neutrally open for /ə/.

\_ /ɛ ə / in "dare , chair, wear".

The starting point of this glide is the cardinal vowel number 3. The front of the tongue is in the half open position.The lips are neutrally open.

During the first part of the glide a part of the tongue nearer to centre than to real back is raised just above the half close position.Then it moves to a central half open position.The lip opening changes: the slight rounding associated with the starting point moves to a neutral spreading.



|              | <b>F1</b>  | <b>F2</b>   | <b>F3</b>   |
|--------------|------------|-------------|-------------|
| <b>/i:/</b>  | <b>280</b> | <b>2620</b> | <b>3380</b> |
| <b>/I/</b>   | <b>360</b> | <b>2220</b> | <b>2960</b> |
| <b>/e/</b>   | <b>600</b> | <b>2060</b> | <b>2840</b> |
| <b>/æ/</b>   | <b>800</b> | <b>1760</b> | <b>2500</b> |
| <b>/ʌ /</b>  | <b>760</b> | <b>1320</b> | <b>2500</b> |
| <b>/ɑ :/</b> | <b>740</b> | <b>1180</b> | <b>2640</b> |
| <b>/ɒ /</b>  | <b>560</b> | <b>920</b>  | <b>2560</b> |
| <b>/ɔ :/</b> | <b>480</b> | <b>760</b>  | <b>2620</b> |
| <b>/ʊ /</b>  | <b>380</b> | <b>940</b>  | <b>2300</b> |
| <b>/u:/</b>  | <b>320</b> | <b>920</b>  | <b>2200</b> |
| <b>/ʒ:/</b>  | <b>560</b> | <b>1480</b> | <b>2520</b> |

Fig.4 The English centring diphthongs.

English pure vowels

#### **IV.3-Acoustic features:**

##### **Conclusion:**

Once the description of the vocalic systems are put side by side we have to be aware of the risk of making wrong predictions about the errors and the form of errors, certain distortions are nevertheless likely to be made. The predictive capacity of contrastive analysis is all the more questionable because four languages are interfering and sometimes the way these languages influence each other may be amazing and not easily predictable.

Considering the sequence v+/n/ which exists in L1 (dialectal Arabic) and L2 (classical Arabic) we may think that our learners would not have any problem with this realization in L4 (English). But this would be underestimating the importance of L3 (French) where the visual representation of the sequence v+/n/ corresponds to the representation of the French nasalized vowels / $\tilde{\text{a}}$ /, / $\tilde{\text{e}}$ / and / $\tilde{\text{o}}$ /.