

General Facts about Vowels

Unlike consonants, vowels are produced with relatively free passage of the airstream; the articulators do not touch and so do not significantly obstruct the flow of air from the lungs.

If the articulators are not involved, then how do we get different vowel sounds?

Changes in the position of the lips and tongue (and thus the jaw), result in changes to the shape of the oral cavity.

Different shapes produce different resonance (remember the bottle analogy from your reading), hence different vowel qualities are produced.

General Facts about Vowels

To describe vowels, we use the position of the tongue and the shape of the lips. If you think about it what is happening in the mouth when you produce a vowel:

- the tongue body can move up or down (tongue height)
- the tongue can move forward or back (tongue frontness/backness)
- the lips can be rounded or not (lip rounding)

Typically, we describe these movements in the following way:

Height

high (close)

mid-high (close-mid)

mid-low (open-mid)

low (open)

Frontness

front

central

back

Lip Rounding

unrounded

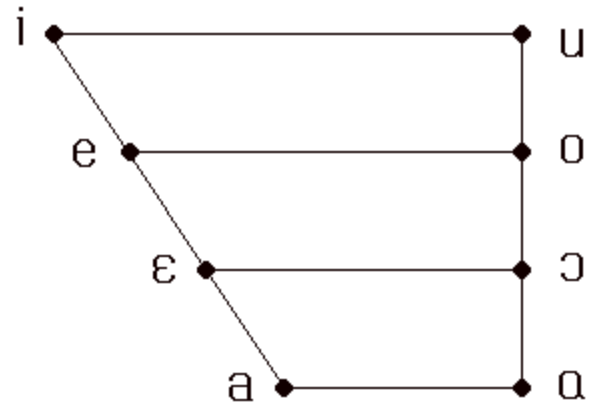
rounded

General Facts about Vowels

These descriptors allow us to describe the consonants of any language *relative to another*.

⇒ That is the “i” in *steed* is high compared to the “e” in *stayed*, where “high” does not refer to any discrete measure of height but to a relative measure on a continuum of possibilities.

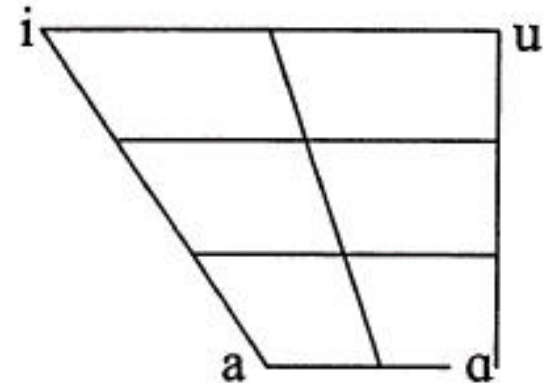
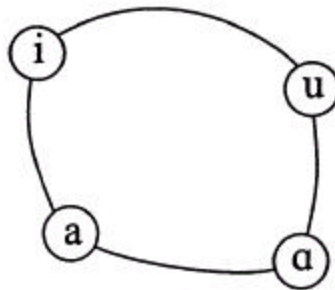
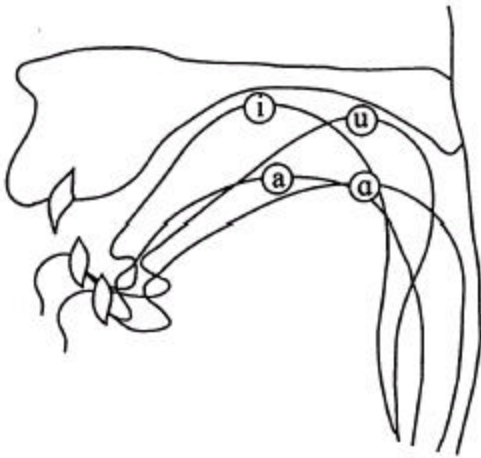
The shape of the IPA vowel chart (the vowel quadrilateral) is meant to represent the possible space in which vowels in languages can occur - along the dimensions of height and frontness/backness.



The Vowel Quadrilateral

The four corners of the vowel quadrilateral represent extreme tongue positions:

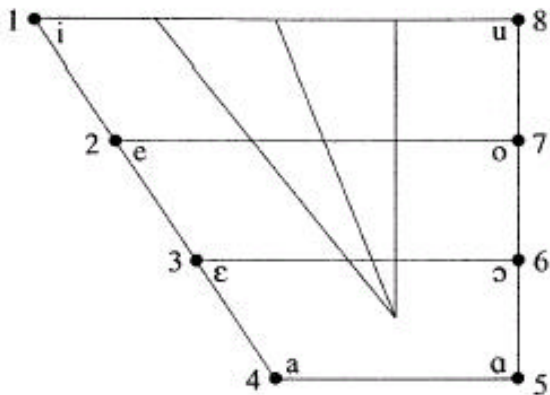
- upper left is the farthest forward, highest vowel possible
- upper right is the farthest back, highest vowel possible
- lower left is the farthest forward, lowest vowel possible
- lower right is farthest back, lowest vowel possible



Cardinal Vowels

The vowels in the corners of the chart and those equally spaced in between (equally spaced in terms of auditory quality) are called **cardinal vowels** and do not represent the vowels of any actual language.

Rather, given that vowels can vary in numerous possible ways, the cardinal vowels were created (by English phonetician Daniel Jones) as a means to standardize the way we describe vowels.



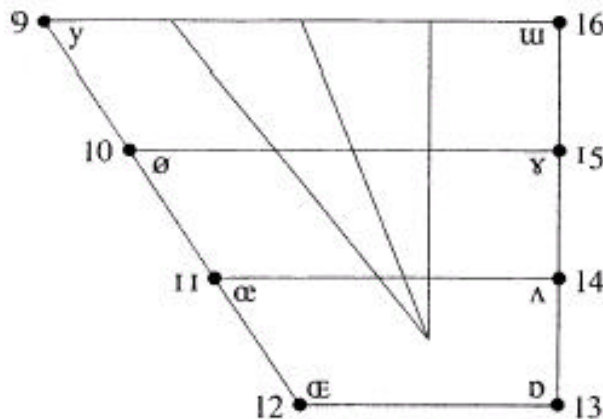
There are 16 cardinal vowels divided into two sets of 8; the 8 on the left are the *primary cardinal vowels*.

[Listen to the primary cardinal vowels](#)

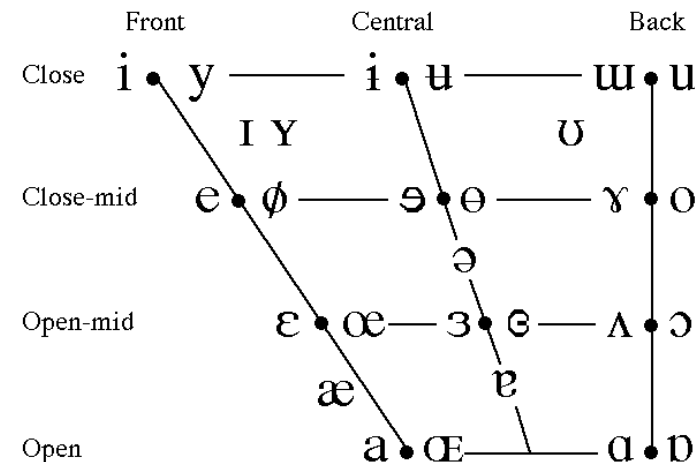
Secondary Cardinal Vowels

The *secondary cardinal vowels* were created to distinguish vowels with various degrees of lip rounding. These vowels have the reverse lip rounding of the primary cardinal vowels.

The secondary cardinal vowels:



All vowels:



Where symbols appear in pairs, the one to the right represents a rounded vowel.

Cardinal Vowel Nearest Equivalents

Even though no language actually has any of the cardinal vowels, some languages come close.

Primary cardinal vowel nearest equivalents:

cardinal [i]: French *si*

cardinal [e]: French *thé*

cardinal [ɛ]: French *même*

cardinal [a]: French *la*

cardinal [u]: German *gut*

cardinal [o]: French *rose*

cardinal [ɔ]: German *Sonne*

cardinal [ɑ]: French *pâte*

Cardinal Vowel Nearest Equivalents

Secondary cardinal vowel nearest equivalents:

cardinal [y]: German *über*

cardinal [ɯ]: ??

cardinal [ø]: French *peu*

cardinal [ɤ]: ??

cardinal [œ]: German *zwölf*

cardinal [ʌ]: SBr.Eng *cup*

cardinal [æ]: ??

cardinal [ɒ]: Br.Eng *hot*

Other Vowel Descriptors

Monophthong: vowel produced with a single, unchanging sound quality, like the vowel in English “do”.

Diphthong: vowel produced with a gradually changing articulation, like the vowel in English “cow”.

Tense/Lax Distinction: refers to how stiffly the tongue is held during the production of a vowel.

- Tense: like the vowel in English “deed”
- Lax: like the vowel in English “did”

English Vowels

English Monophthongs (1)

/i/ high front unrounded tense

➤ seed, lease, machine, Caesar, Phoenix, ceiling

☒ Not before /ɪ/ in same syllable, /fi.ɪ/ ≠ fear

/ɪ/ mid-high front unrounded lax

➤ limp, cyst, women, Mickey, picking, city

☑ Used before /ɪ/ in same syllable, /fɪ.ɪ/ = fear

English Monophthongs (2)

/e/ mid-high front unrounded tense unstressed

➤ chaotic, locate, holiday, **e**ighteen

/ɛ/ mid-low front unrounded lax

➤ bet, again, **f**riend, **a**ny, **b**ear

☑ Used before /ɪ/ in same syllable, /bɛɪ/ = bear

English Monophthongs (3)

/u/ high back rounded tense

➤ sue, ooze, few, canoe, cruise, dilute

☒ Not before /ɪ/ in same syllable, /pʊɪ/ ≠ poor

/ʊ/ mid-high back rounded lax

➤ wood, put, should, bull, brook, hoof, sugar

☑ Used before /ɪ/ in some dialects, /pʊɪ/ = poor

English Monophthongs (4)

/ɔ/ mid-high back rounded tense unstressed

➤ notation, potato, vocation

/ɒ/ mid-low back rounded tense (dialectal variant of /ɑ/)

➤ orange, law, caught, dog, cough

☑ Used before /ɹ/ in same syllable, /fɒɹ/ = four

English Monophthongs (5)

/æ/ low front unrounded lax

➤ bad, hand, thank, glass, **Alabama**

☑ Used before /ŋ/, /hæŋ/ = hang

/ʌ/ mid-low central/back unrounded lax stressed

➤ rough, nut, **once**, puppet, bucket

English Monophthongs (6)

/ɑ/ low back unrounded tense (dialectal variant of /ɔ/)

➤ father, honor, doll, opera, calm, cod

☑ Used before /ɹ/ in same syllable, /fɑɹ/ = far

⇒ Br. English also has /ɒ/, which is further back and more rounded

⇒ Br. English also has /a/, which is a front low vowel

[Listen](#)

Where're the Central Vowels?

Schwa, [ə], is used to represent a range of mid central unstressed vowels.

All English vowels can “move” to become schwa when in an unstressed syllable, but do not always do so.

e.g., beauty vs. beautiful

⇒ Some dialects of Am. English also have a high central vowel referred to as “barred-i”, [ɪ], commonly found in the last syllable of the word “chicken”.

⇒ Br. English also has a mid central [ɜ], which occurs in words like “bird”.

[Listen](#)

English Diphthongs (1)

/eɪ/ stressed version of /e/

➤ way, paid, trade, eight, steak

☒ Not before /ɪ/ in same syllable, /beɪ/ ≠ bear

/oʊ/ stressed version of /o/

➤ rotate, mold, know, shoulder, boat

☒ Not before /ɪ/ in same syllable, /boʊ/ ≠ bore

[Listen](#) to the difference between these and [e] and [o]

English Diphthongs (2)

/aɪ/ low central to mid-high front

➤ **sigh**, **aisle**, **tyke**, **rhyme**, **bike**

/aʊ/ low central to mid-high back

➤ **cow**, **doubt**, **round**, **chowder**

/ɔɪ/ mid-low back to mid-high front

➤ **toy**, **spoil**, **foyer**, **turquoise**

English Diphthongs (3)

Br. English has more diphthongs:

/əʊ/ central to mid-high front

/ɪə/ mid-high front to central

/ɛə/ mid-low front to central

/aə/ low front to central

Occur because of
omission of final “r”

Rhotacization

= “r-coloring”; the effect of [ɹ] on a preceding vowel.

Rhotacized vowels:

Stressed: [ɜ^r]

bird, fur, her, herd

Unstressed: [ə^r]

father, verbose

Both:

murmur, further, perverse

⇒ How is [ɹ] different?

[Listen to](#) Am. English
and Br. English vowels

Nasalization

Occurs when a vowel precedes a nasal consonant.

team $\Rightarrow$ /tĩ m/

seen $\Rightarrow$ /sĩ n/

sing $\Rightarrow$ /sĩ ŋ/

Other Vowel Changes

Diphthongization: occurs when a vowel normally pronounced as a monophthong is produced as a diphthong.

yes	/jɛs/	becomes	/jɛə s/
kat	/kæ t/	becomes	/kæ ə t/

Monophthongization: occurs when a vowel normally pronounced as a diphthong is produced as a monophthong.

ice	/aɪ s/	becomes	/a s/
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other vowels
(by height)

Other High Vowels

[Listen](#) to these in isolation

Swedish has [y, ʏ, ɥ]: [listen](#)

Norwegian has [y, ɥ]: [listen](#)

Turkish has [y, ɯ]: [listen](#)

/y/ high front rounded

⇒ occurs in French, German, Norwegian, Swedish, Turkish, etc.

/ʏ/ high front rounded (lax/short)

⇒ occurs in Swedish, Dutch, German

/ɥ/ high central rounded

⇒ occurs in Swedish, Norwegian

/ɯ/ high back unrounded

⇒ occurs in German, Burmese, Thai, Turkish, etc.

Other Mid-High Vowels

[Listen](#) to these in isolation

/ø/ mid-high front rounded

⇒ occurs in French, German, Dutch, Hungarian, Turkish, Korean, etc.

/ə/ mid-high central unrounded

⇒ occurs in Dutch

/ɵ/ mid-high central rounded

⇒ occurs in Swedish, Cantonese

/ɤ/ mid-high back unrounded

⇒ occurs in Dutch, Bulgarian, Vietnamese, some English dialects!, etc.

Swedish has [ø, ɵ]: [listen](#)

Turkish has [ø] (and y, ɯ): [listen](#)

Gaelic has [ɤ] (and ɯ): [listen](#)

Other Mid-Low Vowels

/œ/ mid-low front rounded

⇒ occurs in French, German, Icelandic, Swedish, etc.

/ɜ/ mid-low central rounded

⇒ occurs in Dutch

[Listen](#) to these in isolation

Swedish and German have [œ]: [listen Swedish](#), [listen German](#)

Other Low Vowels

/ɐ/ low central unrounded

⇒ occurs in Bulgarian, Cantonese, etc.

/œ/ low front rounded

⇒ occurs in Danish

[Listen](#)

Vowel Modifications In Other Languages

Nasalization: unlike English vowels, which are nasalized only in nasal contexts, nasal vowels can be used contrastively in many languages; i.e., words identical but for the presence or absence of nasality on the vowels mean different things.

For example:

- French has nasal and non-nasal vowels: [listen](#)
- Chinantec has two degrees of nasality on vowels: [listen](#)
- In Sudanese, nasalization on vowels spreads when affixation occurs: [listen](#)

Vowel Modifications In Other Languages

Length: unlike in English, where length differences on vowels do not affect meaning, vowel length in many languages is contrastive; i.e., that is words identical but for the presence or absence of length on the vowel mean something different.

For example:

- Danish has long and short vowels: [listen](#)
- Icelandic has long and short diphthongs: [listen](#)
- Finnish has long and short vowels *and consonants*: [listen](#)

Vowel Modifications In Other Languages

Voice quality: as we discussed earlier in the semester, changes in phonation on vowels can affect meaning in many languages when other properties of the word are kept the same.

Changes in phonation include:

- breathy/murmur
- creaky/laryngealized
- pharyngealized
- strident (epiglottalized)
- voicing
- retroflexion

!Xóõ has breathy, pharyngeal, and strident vowels: [listen](#)

Mazatec has breathy and creaky vowels: [listen](#)

Japanese has voiceless vowels: listen to Naomi!

Badaga has retroflex vowels: [listen](#)

Examples of Vowel Inventories

3 vowels:
(Classical Arabic)

i u
a

5 vowels:
(Spanish
Latin, Swahili)

i u
e o
a

[Listen](#)

7 vowels:
(Italian)

e i u
o
ɛ ɔ
a

8 vowels:
(Igbo)

e i u
o
ɛ ɔ
a ɑ

10 vowels:
(Danish)

i y u
e ø o
ɛ œ ɔ
a

(Vietnamese)

i ɯ u
e ʏ o
ɛ ʌ ɔ
a