

Week 6: Vowels & Suprasegmentals

Study Guide

Last week we covered consonants. This week, we'll talk about vowels and suprasegmentals.

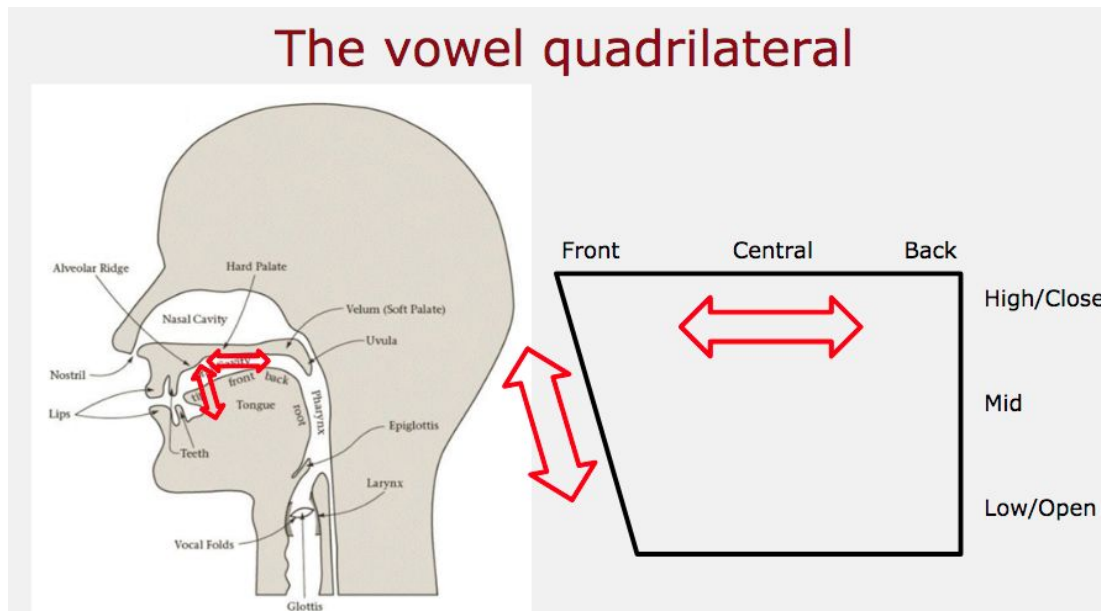
Vowels

Vowels are the most **sonorant** (intense) and the most audible sounds in the speech stream. Vowels are produced with a relatively open vocal tract, so the source of their sound is **vocal fold vibration**, which resonates around the vocal tract. The shape of the vocal tract determines the quality of the vowel.

When describing a vowel, we need to provide information about four different aspects of articulation (four different ways we change the shape of our vocal tract):

- (1) **Height:** where is the body of the tongue vertically (high (close), mid, low (open))?
- (2) **Backness:** where is the body of the tongue horizontally (front, central, back)?
- (3) **Lip rounding:** are the lips rounded or not?
- (4) **Tenseness:** is the tongue tense or not (tense or lax)?

The IPA places vowels in what is known as the vowel quadrilateral, which corresponds to the sagittal section of the vocal tract.



Height

Tongue height corresponds to where the body of the tongue is in vertical space — in other words, how **raised** or **lowered** it is. The highest point of the tongue body is considered to be the height of the vowel. Try saying {seat, set, sat} to feel the mouth opening as the tongue is lowered.

- (1) **High (close):** the body of the tongue is raised (moved up), so the mouth is less open.
 - [i] beet, [ɪ] bit, [u] boot, [ʊ] book
- (2) **Mid:** intermediate “resting” position of the tongue, which can be divided into **close-mid** and **open-mid** depending on how open the mouth is.
 - [ɛ] bet, [ə] the, about, [ʌ] but, [ɔ] bought
- (3) **Low:** the body of the tongue is lowered (moved down), so the mouth is more open.
 - [æ] bat, [ɑ] bot

Backness

Where is the body of the tongue horizontally? Besides being held high, mid, or low, the tongue can also be moved **forward (front)** or **back** in the oral cavity. Try saying {leak, lick, look, Luke} to feel the tongue move back.

- (1) **Front:** the body of the tongue is moved forward.
 - [i] beet, [ɪ] bit, [ɛ] bet, [æ] bat
- (2) **Central:** the body of the tongue is in resting position.
 - Schwa: [ə] the, about
- (3) **Back:** the body of the tongue is moved back.
 - [u] boot, [ʊ] book, [ɔ] bought, caught, [ɑ] bot

Lip Rounding

Are the lips rounded or unrounded? On the IPA vowel chart, where symbols appear in pairs, the one to the right represents a rounded vowel.

- (1) **Rounded:** lips are rounded. In English, only back vowels are rounded. But other languages (French and German for example) have front rounded vowels (see figure below).
 - [u] boot, [ʊ] book, [ɔ] bought
- (2) **Unrounded:** lips are unrounded
 - All other English vowels are unrounded.

Tenseness

Is the tongue tense or not? Tense here means a more “extreme” gesture — closer to the edge of vowel space.

- (1) **Tense:** a more “extreme” gesture
 - [i] beet, [u] boot, [ɔ] law, [ɑ] spa
- (2) **Lax:** a less “extreme” gesture
 - [ɪ] bit, [ʊ] book, [ɛ] bet, [ʌ] but, [ə] the, [æ] | [ɑ] bat

Vowels can be divided into two categories:

- (1) **Monophthongs** - simple vowel sounds
- (2) **Diphthongs** - complex vowel sounds, consisting of a transition from one vowel to another in the same syllable (move in vowel space).

Suprasegmentals

So far, we've looked at segments: consonants and vowels, but there are other things "riding on top of" the segments. We call these **suprasegmental**.

- (1) **Syllables** are the "host" for suprasegmentals. The mouth and vocal tract are well designed for repetitive cycles of opening and closing (basic activity in chewing); each such cycle corresponds (roughly) to a syllable. Syllables can be broken down into:
 - (a) **Onset** - any consonants that occur before the rhyme (optional, usually not vowels)
 - (b) **Rhyme** - the vowel and any consonants that come after it, the segments that match in words we think of as rhyming (man, can, plan)
 - (i) **Nucleus** - the vocalic part of the rhyme (vowels, usually not consonants)
 - (ii) **Coda** - the final consonants (optional)
- (2) **Length**: some speech sounds are longer than others. Sometimes this variation is due to things like speaking quickly (running out the door) or slowly (reading a story to a baby). **In some languages, differences in duration are meaningful.** For example, in Finnish, both vowels and consonants can be long or short, and the contrast can make a difference in word meaning. Long vowels are denoted with []
 - (a) i. [muta] 'mud'
 - ii. [mu ta] 'some other'
 - iii. [mut a] 'but'

Importantly, the difference between long and short segments is **dependent on the overall speech rate**; you have to compare the duration of any given segment with the duration of the other segments to figure out if it was long or short.

- (3) **Stress**: a means for marking **prominence**. Stressed syllables are usually longer, louder, higher, and vowels are fully articulated; unstressed syllables are shorter, weaker and vowels are often reduced to schwa.
 - (a) In the IPA, stress is marked before the beginning of a syllable: primary stress with [ˈ] and secondary stress with [ˌ]. In our class, stress will be denoted with CAPS on practice and exam questions.
 - (b) In some languages, **stress is predictable**.
 - (i) In Czech, stress almost always falls on the first syllable of a word.
 - (ii) In Welsh, stress is almost always on the next to last syllable of a word.
 - (iii) In French, stress is almost always on the last syllable of a phrase.
 - (c) In other languages (Russian and English for example), **stress is not predictable** and must be learned for each word. In such languages, the placement of stress can cause a difference in meaning (**contrastive**).
 - (i) PERmit (noun) vs. perMIT (verb)
 - (ii) WHITE house vs. white HOUSE
- (4) **Intonation**: we can produce voiced sounds (especially vowels) with different **itches** (or fundamental frequencies) by **changing the rate of vibration of our vocal chords**. The pattern of pitch movements across a stretch of speech is often called intonation.
 - (a) The intonation pattern of an utterance plays a role in **determining its meaning**.

- (i) a. You got an A on the test
b. Yes
- (b) One way we can think about intonation is to assume there are two different ways of marking intonation in sentences:
- (i) **Pitch accents** involve a pitch change (higher or lower) in the middle of an utterance to highlight important information.
- 1) Who kissed Peter? MARY kissed Peter.
 - 2) Who did Mary kiss? Mary kissed PETER.
 - 3) What did Mary do to Peter? Mary KISSED Peter
- (ii) **Phrase tones** involve a pitch change (higher or lower) at the end of a phrase to either affect the **overall meaning** (1) or to **group words into phrases** (2).
- 1) a. You got an A on the test. (**sentence final intonation**)
b. You got an A on the test? (**question intonation**)
 - 2) c. You got an A on the test, a C on the homework, and a B on the quiz. (**continuation rise**).
- (5) **Tone:** the pitch at which the syllables in a word are pronounced In many languages, this can make a difference in the word's meaning (**tone languages**).
- (a) Examples of tone languages: Thai; Mandarin; Vietnames; languages in New Guinea (Skou); many Bantu languages (Zulu); other African languages (Yoruba and Igbo); and many North and South American Indian languages (Apache, Navajo, Kiowa, Mazotec, and Bora).
- (b) Examples from Mandarin: **different tones, different meanings**
- | | | | |
|---------|-----|--------------------|----------|
| a. [ma] | 55 | high level | 'mother' |
| b. [ma] | 35 | high rising | 'hemp' |
| c. [ma] | 214 | low falling rising | 'horse' |
| d. [ma] | 51 | high falling | 'scold' |
- (c) In tone languages, **tones can be of two types:**
- (i) **level** - syllables are produced with a steady tone (e.g. high, mid, low); all tone languages have level tones.
 - (ii) **contour** - syllable produced with tones that glide from one level to another; some tone languages have contour tones.

Reminder: On the exam, you'll be provided with the [International Phonetic Alphabet](#), but you'll need to know how to interpret it. It is **really important** for you to try the practice questions in order to do well on the next exam.