Phonetics

General Linguistics

Oujda λinguistics Club

www.oujdalinguistics.club

Phonetics?

Phonetics is the study of speech sounds. Phonetics is divided into 3 branches:

- **Articulatory**: the study of how the vocal tract produces the sounds of language. (speaker)
- **Auditory/Perceptional**: concerned with how listeners perceive these sounds. (listener)
- **Acoustic**: focuses on the physical properties of sounds and how speech sounds are transmitted in the airstream by a speaker to a listener. (both)

Segment Sounds

Everyone who knows a language knows how to **segment** sentences into words, and words into sounds.

The Phonetic Alphabet

Orthography (or spelling) does not necessarily represent the sounds of a language in a consistent way.

Examples

1. The same sound may be represented by many letters or combination of letters. (e.g. he, key, seize...)
2. The same letter may represent a variety of sounds. (e.g. father, made, village...)
3. A combination of letters may represent a single sound. (e.g. shoot, character, Thomas...)
4. A single letter may represent a combination of sounds. (e.g. xerox...)
5. Some letters may not be pronounced at all. (e.g. autumn, sword, resign, psychology...)
6. There may be no letter to represent a sound that occurs in a word. (e.g. cute, use...)

The IPA

- In 1888, the International Phonetic Alphabet (IPA) was developed in order to have a system in which there was a one-to-one correspondence between each sound in a language and each phonetic symbol.
- Someone who knows the IPA knows how to pronounce any word in any given language.

Articulatory Phonetics

Most speech sounds are produced by pushing lung air through the vocal cords.

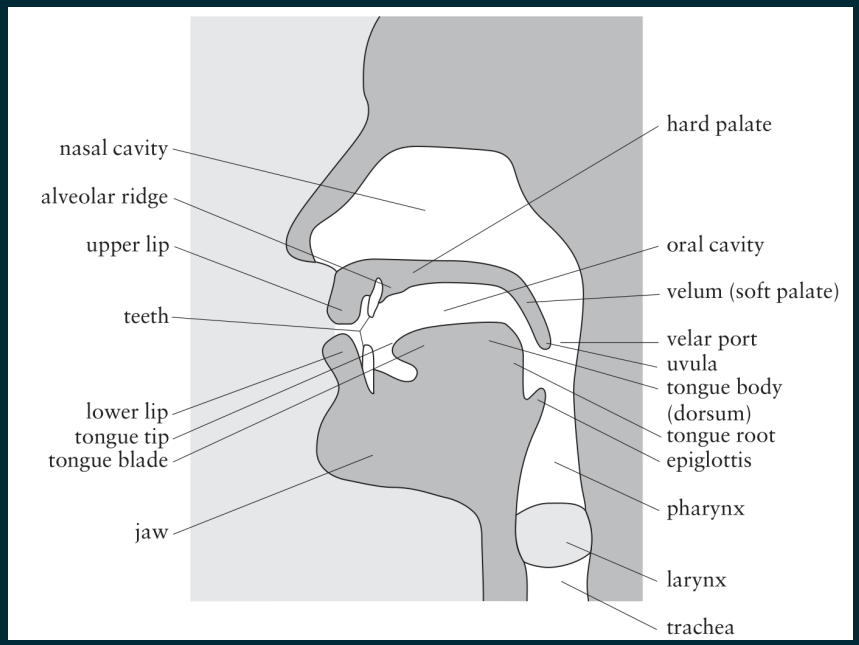

Figure: The upper vocal tract

Consonants

The sounds of all languages fall into two classes: consonants and vowels. Consonants are classified according to:

- **Place of Articulation**: where in the vocal tract the airflow restriction occurs.
- **Manner of Articulation**: how the airstream is affected as it flows from the lungs up and out of the mouth and nose.
- **Voicing**: specifies whether the vocal cords are vibrating.

IPA Table for Consonants

For the pronounciation of the "full" IPA Chart, visit:
http://www.ipachart.com/

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stop	p b			t d		k g	ʔ
Nasal	m			n		ŋ	
Fricative		f v	θ ð	s z	ʃ ʒ		h
Affricate					tʃ tʒ		
Glide	ʍ w				j	ʍ w	
Liquid				r l			

Table: Consonants Chart for American English

Vowels

Vowels are produced with little restriction of the airflow from the lungs out through the mouth and/or the nose. They involve the highest degree of loudness and pitch. They are all voiced. Vowels are classified according to:

1. **Vowel quality**
   - Height: whether the tongue is high or low.
   - Backness: whether the tongue is in the front or the back of the mouth.
   - Roundness: whether or not the lips are rounded.
2. **Vowel quantity**
   - Longness: whether the duration of the articulation of a vowel is long or short.

Vowels

- **Round** vowels: [u] [ʊ] [o] [ɔ]
  - Produced by rounding the lips
  - English has only back round vowels, but other languages such as French and Swedish have front round vowels
- **Diphtongs**: [aɪ] [aʊ] [ɔɪ]
  - A sequence of two vowel sounds (as opposed to the **monophthongs** we have looked at so far)
- **Nasalization**:
  - Vowels can also be pronounced with a lowered velum, allowing air to pass through the nose
  - In English, speakers nasalize vowels before a nasal sound, such as in the words *beam*, *bean*, and *bingo*.
  - The nasalization is represented by a tilde on the nasalized vowel: *bean* [bĩn]

Vowels

- **Tense** vowels:
  - Are produced with greater tension in the tongue
  - May occur at the end of words
- **Lax** vowels:
  - Are produced with less tongue tension
  - May not occur at the end of words

Tense vowels:

i beat

e bait

u boot

o boat

a hah

aɪ high

aʊ how

Lax vowels:

ɪ bit

ɜ bet

ʊ put

ɔ bore

ɔɪ boy

æ hat

ʌ hut

ə about

Vowels

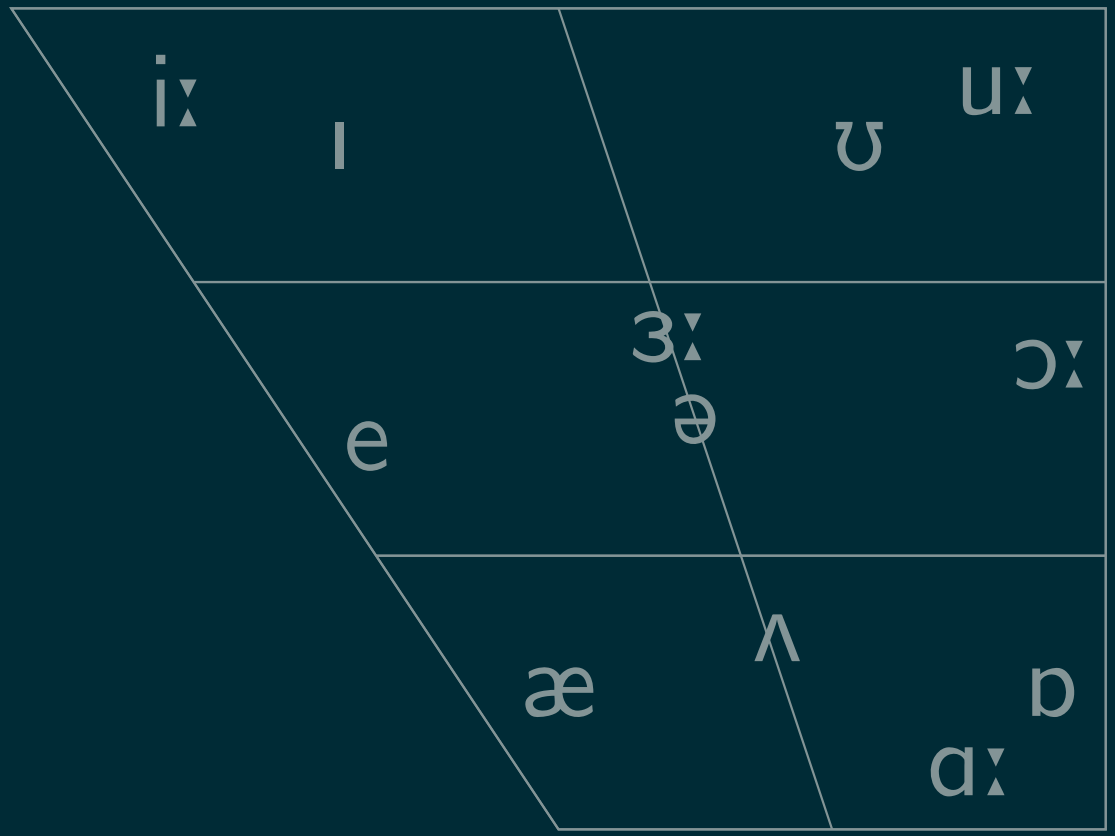

Figure: The Cardinal Vowel Chart

Vowels

[iː] cream [kriːm]

[ɪ] bit [bɪt]

[e] bet [bet]

[æ] cat [kæt]

[ɜː] firm [fɜː(r)m]

[ə] about [əboʊt]

[ʌ] cut [kʌt]

[uː] boot [buːt]

[ʊ] put [pʊt]

[ɔː] corn [cɔː(r)n]

[ɒ] dog [dɒg]

[ɑː] hard [hɑː(r)d]

Major Phonetic Classes

- **Noncontinuants**: the airstream is totally obstructed in the oral cavity.
  - Stops and affricates
- **Continuants**: the airstream flows continuously out of the mouth
  - All other consonants
- **Obstruents**: the airstream has partial or full obstruction
  - Oral stops, fricatives, and affricates
- **Sonorants**: air resonates in the nasal or oral cavities
  - Vowels, nasal stops, liquids, and glides

Major Phonetic Classes (cont.)

- **Consonantal**: there is some restriction of the airflow during articulation
  - All consonants except glides
- Consonantal sounds can be further subdivided:
  - **Labials**: articulated with the lips. ([p] [b] [m] [f] [v] [w] [m])
  - **Coronals**: articulated by rising the tongue blade. ([θ] [ð] [t] [d] [n] [s] [z] [ʃ] [ʒ] [tʃ] [dʒ] [l] [r])
  - **Anteriors**: produced in the front part of the mouth (from the alveolar area forward). ([p] [b] [m] [f] [v] [θ] [ð] [t] [d] [n] [s] [z])
  - **Sibilants**: produced with a lot of friction that causes a hissing sound, which is a mixture of high-frequency sounds. ([s] [z] [ʃ] [ʒ] [tʃ] [dʒ])
- **Syllabic** sounds: sounds that can function as the core/the nuclee of a syllable. (e.g. dazzle, rhythm)
  - Vowels, liquids, and nasals

Primary vs. Secondary Articulation

- Primary articulation: is the original articulation of speech sounds without any additional allophonic realization.
- Secondary articulation: is the allophonic realization of speech sounds. It is a kind of coloring and modification.

Prosodic Features

- **Prosodic**, or **suprasegmental** features of sounds, such as length, stress and pitch, are features above the segmental values such as place and manner of articulation.
- Prosodic features are dealt within the sub-branch of Phonetics: Prosody.
- **Prosody** is the examination of prosodic features that doesn't exist on the level of writing.

Prosodic Features: Length

- **Length** is associated with timing. In some languages, such as Japanese, the length of a consonant or a vowel can change the meaning of a word (Hence contrastictive/lexical):

Examples

biru [biru] "building"	biiru [biːru] "beer"
saki [saki] "ahead"	sakki [sakːi] "before"

Prosodic Features: Stress

- **Stress** is associated with increased loudness and is a relative prominence on the syllable. In English, grammatical differences can be signaled by the placement of primary stress. The word survey as a verb is stressed on the 2nd syllable, but as a noun on the first. Compound nouns and noun phrases, such as blackbird and black bird, also exemplify stress differences.

Prosodic Features: Pitch

The pitch of a sound is how high or low it is. We produce high pitched sounds when our vocal folds have a high-frequency vibration, and when our vocal folds vibrate more slowly, the resulting sound is lower in pitch.

Pitch: Tone

- Some languages use pitch information to signal changes in word meaning. If a language uses pitch this way, the pitch information is called **tone**.
- **Tone**: is the quality of the sound; it is basically the pitch pattern (high, mid, low, falling, rising and so on) of a syllable or a vowel. In the majority of African and SE Asian languages, tone is contrastive/lexical and a feature of the lexicon. (Pike, 1948) defines as tonal any language having significant, contrastive but relative pitch on each syllable.

Examples from Nupe (Nigeria)

High: [bá] "to be sour"

Mid: [bā] "to cut"

Low: [bà] "to count"

Pitch: Intonation

- Languages also use pitch in another way, not to change word meaning, but to signal information at the level of the discourse, or to signal a speaker's emotion or attitude. When pitch is used this way, it's called **intonation** rather than tone.
- The same sequence of words may have different connotations depending on the pitch contours, so that You're coming! uttered with a falling intonation - a command - means something different from the same sequence with a rising contour, You're coming? - a question.