

Phonetics

Phonetics is the study of the inventory and structure of language sounds.

Sounds in language - phones/ speech sounds

Nonspeech sounds - raspberry, burp, growl

Two approaches to the study of phonetics:

articulatory phonetics - the physiology of speech production

acoustic phonetics - the physics of speech sounds

In this section we will focus on articulatory phonetics

There have been efforts since the 16th century to devise a universal system to transcribe speech sounds. The best known is the International Phonetic Alphabet (or [IPA](#))

Goal: represent each sound of human speech with 1 symbol.

These sounds are written in square brackets [] to indicate that they are individual speech sounds that stand apart from a language's organization of the sound system.

Although the ideal is to use a single symbol for a single sound, phoneticians take shortcuts when writing down the sounds for languages. For example, [p] is used for different sounds in English and Russian. English speakers press their lips together while Russian speakers draw their lips slightly inward. But since each form is frequent in its respective language, phoneticians write both as [p].

However, [p] and [t] are distinct categories of sound in all languages.

Speech requires:

air supply lungs
sound source - vibrator larynx (vocal cords)
set of filters pharynx
 oral cavity
 nasal cavity

Air flows out lungs, up trachea (windpipe) and through the larynx (a box of cartilage and muscle - voice box/Adam's apple). Sheets of muscle line the inner wall. A set of these muscles flare outward - the vocal folds/cords. The folds can be pulled together or apart. The space between the folds is the glottis. The glottis has various positions or glottal states:

1. voiceless - the vocal folds are pulled apart
2. voiced - the vocal folds are close together and vibrating. This produces voicing, which can be felt by touching the voice box with your finger while speaking.
3. whisper - the front of the folds are closed while the back is open.

Sound Classes

The phones can be grouped together on the basis of their phonetic properties
 e.g. voiced vs. voiceless

The most basic distinction is between Consonants and Vowels

Consonants - made with a narrow or complete closure of the vocal tract

Vowels - produced with little obstruction. They are more sonorous than consonants. They seem louder and last longer.

Consonants are distinguished by their place of closure/constriction place of articulation
 labial, dental, alveolar, palatal, velar, uvular, pharyngeal and glottal

The manner of articulation specifies the type of constriction

stop - a complete closure of the airway

nasal - lower velum (allow air to pass through the nose)

fricative - continuous airflow with an audible noise

stridents - loud [s, z, ʃ, ʒ], not [f, v, θ, ð]

sibilant is another term for strident

affricates - combine a stop and fricative - a slowly released stop

liquids - [r, l] - continuants without an obstruction

laterals - [l] - air passes over the sides of the tongue

retroflex - [ɻ] - curling back tongue tip or bunching tongue up and back in mouth

Another [r] sound is the flap - tongue tip strikes the alveolar ridge as it passes across it.

[D] - e.g., bitter, butter

Vowels are produced by varying the shape of the oral cavity

	Front	(Central)	Back
High	iy		uw
	ɪ		ʊ
Mid	ey	ə	ow
	ɛ	ʌ	ɔ
Low	æ	a	

[iy, ey, ɔ, ow, uw] are tense vowels - they have a greater degree of constriction in the tongue body or tongue root.

Lax vowels have less constriction.

	Tense		Lax
heat	[iy]	hit	[ɪ]
mate	[ey]	met	[ɛ]
		mat	[æ]
		cut	[ʌ]
		about	[ə] also sofa

shoot [uɹ] should [ʊ]
coat [oʊ] caught [ɔ] in some dialects
vs. cɔt [ɑ]

Syllabic liquids and nasals are so resonant they function as syllabic nuclei.

bird [bɹd] [bærd] [bærd]
American IPA
button [bʌt̬n̩]
rhythm [rɪð̬m̩]

Glides [y] yes, boy IPA [j]
[w] wet, now

[y] ~ [ɪ] when prolonged
[w] ~ [u] “ “
sometimes transcribed as sequence [iɛs]

voiceless [w̥] [ɱ] which, when, where

Simple vowels and diphthongs - change in quality
pit, set, cat, dog, but, put, suppose - no change in voice quality

say, buy, cow, ice, lout, go, boy - change in voice quality

It is harder to feel vowel articulations since they have less constriction

Diphthongs
eyes [aɪ] tied [aɪ]
loud [aʊ] down [aʊ]

Nasalized vowels are made with a lowered velum
win [wɪ̃n]

French pain [pɛ̃] ‘bread’

Other vowels and consonants

	Unrounded	Rounded
High	ɪ	ü
	ɪ	ʊ
Mid	e	ö
	ɛ	œ
Low	æ	

Length long vs. short vowels and consonants

Yap [θis] 'to topple' [θi:s] '(a) post'

Italian [fatɔ] 'fate' [fat:ɔ]

Stress, or prominence, combines the effects of pitch, loudness and length

primary ' acute

secondary ` grave

present [prɛzənt] [pri:zɛnt]

Coarticulation is how the articulation of one sound affects that of another
e.g., the nasalization of a vowel before a nasal consonant

bank [bæŋk] keep cool

Coarticulation makes articulation easier, less effortful

Articulatory processes are adjustments in articulation

Assimilation - one sound becomes more like another

backwards or regressive [bæŋk]

forwards or progressive please [pli:z] pure [pyʊr]

negative morpheme /in-/

impossible, intangible, inconsequential

Dissimilation is when one sound becomes less like another

fifths [fθs] [fts]

Deletion is the elimination of a sound

fifths [fθs] [fs]

parade [pərəyd] [prɛyd]

Epenthesis is the insertion of a vowel or consonant

prince [prɪns] [prɪnts]

Metathesis is the reordering of a sound sequence

spaghetti [pæsɛDɪj]

children often modify the initial [spə] [pəs]

prescribe perscribe