

# PHONETICS

- the general study of the characteristics of speech sounds.

In order to describe speech sounds, it is essential to know what an individual sound is, and how each sound differs from all other sounds. When we speak, the sounds seem to run together and it isn't often obvious where one sound ends and the next begins.

Speakers of English can separate words, e.g. *keepout* into the two words *keep* and *out* because they know the language. There is usually no pause between words (unless when one needs to take a breath).

Compare the pronunciation of these expressions:

*grade A*    *gray day*  
*I scream*    *ice cream*

If you know a language you have no difficulty segmenting the continuous sounds of speech. Everyone who knows a language knows how to segment sentences into words, and words into sounds.

The science of phonetics tries to describe all of the sounds used in all languages of the world.

<b>acoustic phonetics</b>	focuses on the physical properties of sounds,
<b>auditory phonetics</b>	focuses on how listeners perceive these sounds,
<b>articulatory phonetics</b>	focuses on how the vocal tract produces the sounds of language,

**Orthography/ alphabetic spelling** does not represent the sounds of a language in a consistent way.

The problems that appear:

- The same sound can be represented by many letters or combination of letters:  
*people*    *key*    *she*    *sea*
- The same letter can represent a variety of sounds:  
letter "a" in: *father*    *wanted*    *many*    *made*
- a combination of letters may represent a single sound:  
*either*    *deal*    *character*
- a single letter may represent a combination of sounds:  
*xerox*
- some letters in a particular word may not be pronounced at all:  
*sword*    *lamb*    *write*
- there may not be a letter to represent a sound that appears in a word:  
*use*    *cute*

In 1888 members of the International Phonetic Association developed a **phonetic alphabet** to symbolize the sounds of all languages. Ordinary letters and invented symbols were used. Each character of the alphabet had exactly one value across all of the world's languages. A person

who knows this alphabet will know how to pronounce a word written in it, and upon hearing a word pronounced, will know how to write it using the alphabetic symbols. The symbols do not say everything about the sounds, which may vary from person to person and which may depend on their position in a word.

**TABLE 6.1 | A Phonetic Alphabet for English Pronunciation**

Consonants						Vowels			
p	pill	t	till	k	kill	i	beet	ɪ	bit
b	bill	d	dill	g	gill	e	bait	ε	bet
m	mill	n	nil	ŋ	ring	u	boot	ʊ	foot
f	feel	s	seal	h	heal	o	boat	ɔ	bore
v	veal	z	zeal	l	leaf	æ	bat	a	pot/bar
θ	thigh	tʃ	chill	r	reef	ʌ	butt	ə	sofa
ð	thy	dʒ	gin	j	you	aɪ	bite	aʊ	bout
ʃ	shill	ɹ	which	w	witch	ɔɪ	boy		
ʒ	measure								

Using the IPA symbols, we can now unambiguously represent the pronunciation of words.

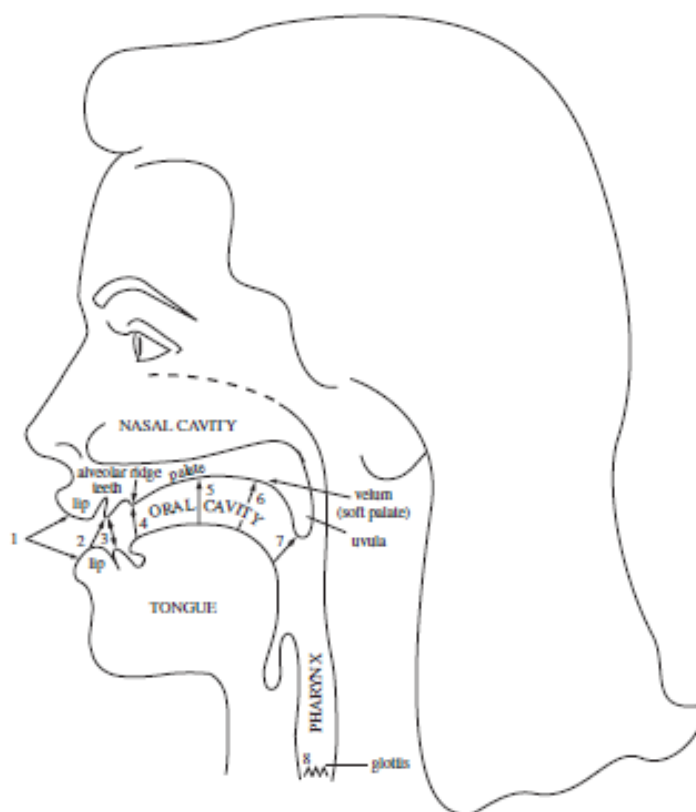
Spelling	Pronunciation
though	[ðoʊ]
thought	[θɔt]
rough	[rʌf]
bough	[baʊ]
through	[θru]
would	[wʊd]

The production of any sound involves the movement of air. Most speech sounds are produced by pushing lung air through the vocal cords. The sounds of all languages fall into two classes: consonants and vowels.

**Articulatory Phonetics**

The production of any sound involves the movement of air. Most speech sounds are produced by pushing lung air through the *vocal cords*. We classify consonants according to where in the vocal tract the airflow restriction occurs. It is called the **place of articulation**.

- The major places of articulations are: bilabial, labiodental, interdental, alveolar, (alveo)palatal, velar uvular, glottal



**FIGURE 6.1** | The vocal tract. Places of articulation: 1. bilabial; 2. labiodental; 3. interdental; 4. alveolar; 5. (alveo)palatal; 6. velar; 7. uvular; 8. glottal.

## Consonants- place of articulation

**Bilabials** [p] [b] [m] using both (= bi) upper and lower lips (= labia), articulation by bringing both lips together

**Labiodentals** [f] [v] articulation by touching the bottom lip to the upper teeth. These are sounds formed with the upper teeth and the lower lip.

**Interdentals/Dentals** [θ] [ð] These sounds, both spelled *th*, are pronounced by inserting the tip of the tongue between the teeth.

**Alveolars** [t] [d] [n] [s] [z] [l] [r] all of these sounds are pronounced with the tongue raised in various ways to the alveolar ridge.

- [t,d,n] the tongue tip is raised and touches the ridge, or slightly in front of it
- [s,z] the sides of the front of the tongue are raised, but the tip is lowered so that air escapes over it
- [l] the tongue tip is raised while the rest of the tongue remains down, permitting air to escape over its *sides*; hence, [l] is called a **lateral** sound.

- [r] air escapes through the central part of the mouth

**Palatals** [ʃ] [ʒ] [tʃ] [dʒ] [j] the constriction occurs by raising the front part of the tongue to the palate

**Velars** [k] [g] [ŋ] the sounds are produced by raising the back of the tongue to the soft palate or velum,

**Uvulars** [ʀ] [q] [ɢ] uvular sounds are produced by raising the back of the tongue to the uvula, the fleshy protuberance that hangs down in the back of our throats. The *r* in French is often a uvular *trill* symbolized by [ʀ]. The uvular sounds [q] and [ɢ] occur in Arabic. These sounds do not ordinarily occur in English.

**Glottals** [h] The sound is from the flow of air through the open *glottis*,

The table below summarizes the classification of these English consonants by their place of articulation.

**TABLE 6.2 | Place of Articulation of English Consonants**

<b>Bilabial</b>	p	b	m				
<b>Labiodental</b>	f	v					
<b>Interdental</b>	θ	ð					
<b>Alveolar</b>	t	d	n	s	z	l	r
<b>Palatal</b>	ʃ	ʒ	tʃ	dʒ			
<b>Velar</b>	k	g	ŋ				
<b>Glottal</b>	h	ʔ					

### Manner of Articulation

The manner of articulation is the way the airstream is affected as it flows from the lungs and out of the mouth and nose.

- Voiceless sounds are those produced with the vocal cords apart so the air flows freely through the glottis super [supər]
- Voiced sounds are those produced when the vocal cords are together and vibrate as air passes through buzz [bʌz]

rope/robe      fate/fade      rack/rag

## Nasal and Oral Sounds

The voiced/voiceless distinction differentiates the bilabials [b] and [p]. The sound [m] is also a bilabial, and it is voiced. What distinguishes it from [b]?

Sounds produced with the velum up, blocking the air from escaping through the nose, are oral sounds, because the air can escape only through the oral cavity.

Most sounds in all languages are oral sounds. When the velum is not in its raised position, air escapes through both the nose and the mouth. Sounds produced this way are nasal sounds. The sound [m] is a nasal consonant. Thus [m] is distinguished from [b] because it is a nasal sound, whereas [b] is an oral one.

There are three ways of classifying sounds based on phonetic features: by voicing, by place of articulation, by nasalization

[p] is a voiceless, bilabial, oral sound

[n] is a voiced, alveolar, nasal sound

## Stops [p] [b] [m] [t] [d] [n] [k] [g] [ŋ] [tʃ] [dʒ] [ʔ]

Stops are consonants in which the airstream is completely blocked in the *oral* cavity for a short period (tens of milliseconds). All other sounds are **continuants**, meaning that the airflow is continuous through the oral cavity.

The sound [t] is a stop, but the sound [s] is not, and that is what makes them different speech sounds.

## Fricatives [f] [v] [θ] [ð] [s] [z] [ʃ] [ʒ] [h]

Fricatives are produced by severely obstructing the airflow so as to cause friction

## Affricates [tʃ] [dʒ]

These sounds are produced by a stop closure that is released with a lot of friction

## Liquids [l] [r]

They are produced by causing some obstruction of the airstream in the mouth, but not enough to cause any real friction.

## Glides [j] [w]

The sounds [j] and [w], the initial sounds of *you* [ju] and *we* [wi], are produced with little obstruction of the airstream.

**\*Approximants** In some books the sounds [w], [j], [r], and [l] are alternatively called approximants because the articulators approximate a frictional closeness, but no actual friction occurs.

## Trills and flaps

Trill - produced by rapidly vibrating an articulator

Flaps - produced by a flick of the tongue against the alveolar ridge

**TABLE 6.4** | Some Phonetic Symbols for American English Consonants

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
<b>Stop (oral)</b>							
voiceless	p			t		k	ʔ
voiced	b			d		g	
<b>Nasal (voiced)</b>	m			n		ŋ	
<b>Fricative</b>							
voiceless		f	θ	s	ʃ		h
voiced		v	ð	z	ʒ		
<b>Affricate</b>							
voiceless					tʃ		
voiced					dʒ		
<b>Glide</b>							
voiceless	ɱ					ɰ	
voiced	w				j	w	
<b>Liquid (voiced)</b>							
(central)				r			
(lateral)				l			

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## VOWELS

Vowels are produced with little restriction of the airflow from the lungs out the mouth and/or the nose. The quality of a vowel depends on the shape of the vocal tract as the air passes through. Different parts of the tongue may be high or low in the mouth; the lips may be spread or pursed; the velum may be raised or lowered.

**Vowels** are classified by how **high** or **low** the tongue is, if the tongue is in **the front** or **back of the mouth**, and whether or not the **lips are rounded**.

## Tongue Position

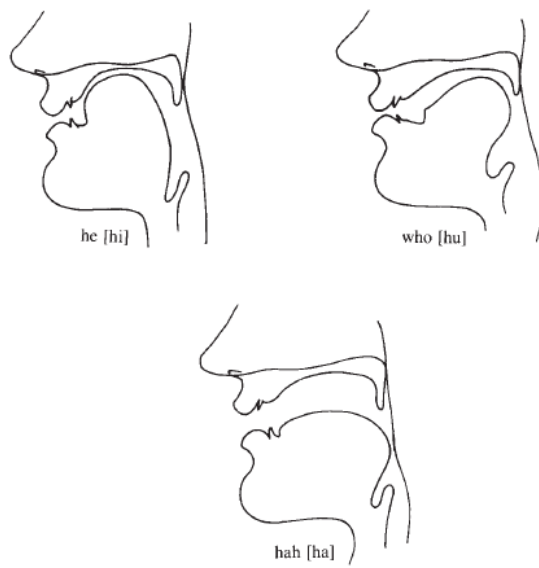


FIGURE 6.4 | Position of the tongue in producing the vowels in he, whp, and hah.

	Front	Central	Back
High	i		u
Mid	ɪ e ɛ	ə ʌ	ʊ o ɔ
Low	æ		a

[i] *eat, key, see*

[ɪ] *hit, myth, women*

[e] *great, tail, weight*

[ɛ] *dead, pet, said*

[æ] *ban, laugh, sat*

[ə] *above, sofa, support*

[ʌ] *blood, putt, tough*

[u] *move, two, too*

[ʊ] *could, foot, put*

[o] *no, road, toe*

[ɔ] *ball, caught, raw*

[a] *bomb, cot, swan*

[aj] *buy, eye, my*

[aw] *cow, doubt, loud*

[ɔɔj] *boy, noise, void*

**Diphthongs:** [aɪ] [aʊ] [ɔɪ]

a sequence of two vowel sounds

*boy* [bɔɪ]    *bout* [baʊt]

**Tense and lax vowels:**

- **Tense vowels:** produced with greater tension of the tongue muscles, they may occur at the end of words
- **Lax vowels:** produced with less tongue tension

<b>Tense</b>		<b>Lax</b>	
i	beat	ɪ	bit
e	bait	ɛ	bet
u	boot	ʊ	put
o	boat	ɔ	bore
a	hah	ɔɪ	boy
aɪ	high	æ	hat
aʊ	how	ʌ	hut
		ə	about

Sources:

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Yule, G. (2006) *The Study of Language* Cambridge University Press