Phonology

Description of Articulation of Consonants of English

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I. Introduction

Motivation

Human languages display a wide variety of sounds, called phones or speech sounds. There are a great many speech of sounds, but not an infinite number of them-the class of possible speech sounds is finite, and a portion of the total set will be found in the inventory of any human language. Different sounds are produced by varying the speed of the column of air, the size and shape of the resonating chamber, and by introducing various kinds of vibrations into the column. This is why different musical instruments sound different. English speech sounds are formed by forcing a stream of air out of the lungs through the oral or nasal cavities, or both. This air-stream provides the energy for sound production in the mouth, either by making the vocal fold vibrate or by making hissing or popping noises as air escapes through narrow openings in the mouth. Language can be written, record mechanically, and even produced by computers in limited ways, but nevertheless, speech remains the primary way we encode it.

Phonetic transcription

Since the sixteenth century, efforts have been made to devise a universal system for transcribing the sounds of speech. The best-known system, the International Phonetic Alphabet (IPA), has been developing since 1888. The system of transcription attempts to represent each sound of human speech with a single symbol. These symbols are enclosed in brackets [ ] to indicate that the transcription is phonetic and does not represent the spelling system of a particular language. For example, the sound spelled *th* in English this is transcribed as [ð] .

IPA uses this symbol to represent the sound in whichever language it is heard. The use of a standardized phonetic alphabet enables linguistics to transcribe languages consistently and accurately. In North American usage, however, some phonetic symbols differ form those employed by IPA transcription. For example, the sound heard at the beginning of the English word shark is transcribed as [ʃ] [ʒ], [tʃ], [dʒ] in IPA, but usually as [š], [ž], [č], [ǰ], in North America. (IPA table see the next page)

THE INTERNATIONAL PHONETIC ALPHABET (revised to 1993)

CONSONANTS (PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q G		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	N		
Trill	B			r					R		
Tap or Flap				ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

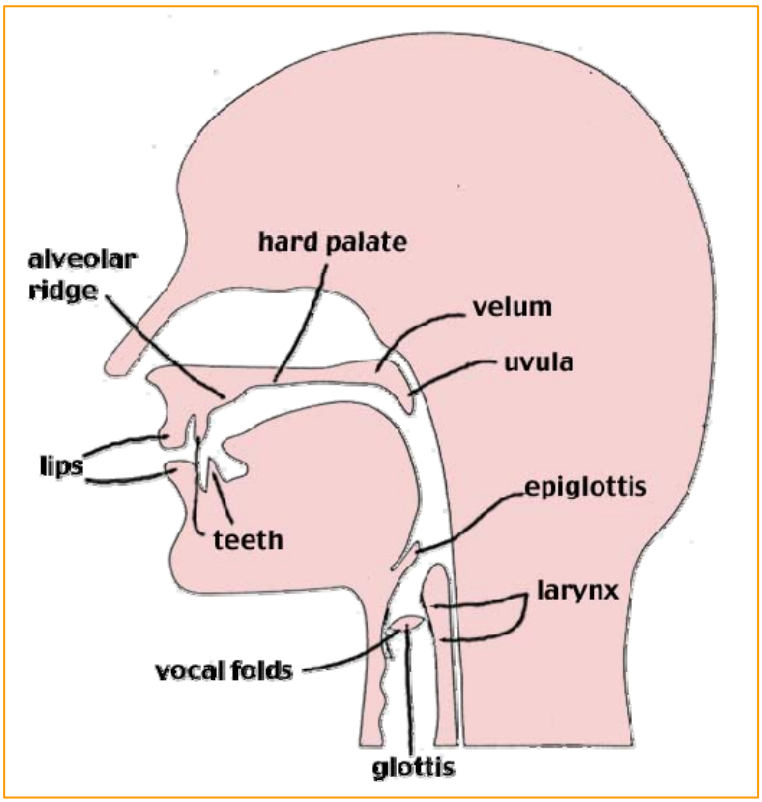
Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

Many languages use a Roman alphabet like that used in the English writing system, the IPA utilized many Roman letters as well as invented symbols. These alphabetic characters have a consistent value, unlike ordinary letters that may or may not represent the same sounds in the same or different languages.

II. Place and Manner of articulation

What is “Place of articulation”?

Different consonantal sounds result according to place of articulation, which is where in the vocal tract the airflow restriction occurs. Movement of tongue and lips, called the articulators, cause the restriction, reshaping the oral cavity in various ways to produce thee various.



Lips: **Bilabial consonants** are made by bring both lips closer together. There are four such sounds in English. [p] pat, [b] bat, [m]mat , [w] with.

Lips and teeth: **Labiodental consonants** are made with the lower lip against the upper front teeth. English has two labiodentals: [f] fat, [v] vat.

Teeth: Interdental consonants are made with the tip of tongue protruding between the front teeth. There are two interdental sounds in most varieties of America English: [θ] thing and [ð] thy.

Alveolar ridge: Alveolar just behind your upper front teeth there is a small ridge called the alveolar ridge. English makes six sounds with tongue tip at or near this ridge: [t] tab, [d] dad, [s] sip, [z]zip, [n] noose, [l] loose.

Central palate (or hard palate): If you let your finger glide back along the roof of your mouth you will note that the front portion is hard and the back portion is soft. Sounds produced by raising the front part of the tongue to the alveolar ridge are called alveolar ridge .Sounds made **palatal consonants** [ʃ], [ʒ],[r], [tʃ] [ʃ], [dʒ], [y].

Velum (or soft palate): Velar articulating by raising the back of the tongue to the soft palate. **Velum consonants** [k], [g], [ŋ]

Glottis: Sounds are produced at the larynx. The space between the vocal folds is the glottis. English has two glottises. One is easy to hear: [h], as in high and history. The other is called a glottal stop and is transcribed phonetically as [?].

What is “Manner of articulation”?

Speech sounds also very in the way the airstreams is affected as it flow form the lungs up and out of the mouth and nose. It may be blocked or practically blocked; the vocal cords may vibrate or not vibrate. It refers to this as the manner of articulation. The process by which the moving column of air is shaped is called the manner of articulation. For English, these are:

Stops: [p], [t], [k], [b], [d], [g]

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

Affricates: [tʃ], [dʒ]

Nasals: [m], [n], [ŋ] (sometimes called “nasal stops”)

Liquids: [l], [r]

Glides: [w], [y], [hw]

Stops

Stop to refer to the sounds produced with the characteristics of airstreams stopped completely in the oral cavity when they enter the oral cavity. Stops occur when the air

stream stops completely for an instant before it exits the vocal tract. Voiceless stops in English are the[p] in ‘pour’ and ‘slap,’ the [t] in ‘time’ and ‘adept,’ and the [k] in ‘cold’ and ‘poke.’ Voiced stops are the [b] in ‘bow’ and ‘crab,’ the [d] in ‘dock’ and ‘blood,’ and the [g] in ‘game’ and ‘bag.’

Fricatives

Fricatives occur when the air stream is audibly disrupted but not stopped completely. Voiced fricatives are the [v] in ‘very’ and ‘shove,’ the [ð] in ‘thy’ and ‘bathe,’ the [z] in ‘zoo’ and ‘wise,’ and the [ʒ] in ‘measure’ and ‘Zha Zha.’

Voiceless fricatives are the [f] in ‘fool’ and ‘laugh,’ the [θ] in ‘thigh’ and ‘bath,’ the [ʃ] in shock’ and ‘nation,’ the [s] in ‘soup’ and ‘miss,’ and the [h] in ‘hope’ and ‘ahead.’

Affricates

An affricate starts out as a stop, but ends up a fricative. There are two affricates in English both of which are palatal. Therefore we do not need to mention place of articulation to describe affricates. The voiceless affricate is the [ʧ] in ‘lunch’ and ‘chapter.’ The voiced affricate is the [ʤ]in ‘germ,’ ‘journal’ and ‘wedge.’

Nasals

Nasals occur when velum is lowered allowing the air stream to pass through the nasal cavity instead of the mouth. The air stream is stopped in the oral cavity, so sometimes nasals are called "nasal stops." We will just call them "nasals." Nasals are the [m] in 'mind' and 'sum,' the [n] in 'now' and 'sign,' and the [ŋ] in 'sing,' 'longer' and 'bank'.

Liquids

The "lateral" liquid, [l], is pronounced with the restriction in the alveolar region at the beginning of syllables, as in 'low' and 'syllable,' but in the velar region at the ends of syllables, as in 'call,' 'halter,' and 'syllable.' It is called "lateral" because air flows around the sides of the tongue The "central" liquid is the [r] in 'rough' and 'chore.' This also has various pronunciations. It is called "central" because air flows over the center of the tongue. So the terms "central" and "lateral" replace the place of articulation in descriptions of the liquids.

Glides

Glides occur when the air stream is unobstructed, producing an articulation that is Vowel-like, but moves quickly to another articulation making it a consonant. Sometimes glides are described as semi-vowels. There are two sounds in English, [w] and [j], having vowel-like features as far as their articulation is concerned, but which differ from their vowel counterparts [u] and [i] respectively through their distribution, force of articulation and length. When we articulate a glide the articulatory organs start by producing a vowel-like sound, but then they immediately change their position to produce another sound. It is to the gliding that accompanies their articulation that these sounds owe their name. As we have seen earlier, precisely because of their ambiguous nature they are also called semivowels or semi-consonants. Unlike vowels, they cannot occur in syllable-final position, can never precede a consonant and are always followed by a genuine vocalic sound. The glides in English include the [w] in ‘witch’ and ‘away,’ and the [y] in ‘yes’ and ‘yoyo.’ Some English speakers have a voiceless alveolar glide. This is transcribed /hw/ and occurs in ‘whether,’ ‘which,’ and why.

III. Description of articulation of consonants

Consonant articulation: Airflow is modified in the oral cavity by the placement of th tongue and the positioning of the lips. These modifications occur at specific places or points of articulation. The major places of articulation used in speech production are outlined in this section.

Classification of English Consonants by manner and place of articulation

Place of articulation	**Manner of articulation**				
	plosive	fricative	semi-vowel	liquids, incl. laterals	nasal
labial *(lips)*	p b		w		m
labio-dental *(lips and teeth)*		f v			
dental *(teeth)*		θ th			
alveolar *(gums)*	t d	s z	y	l r	n
palatal *(hard palate)*		sh zh			
velar *(soft palate)*	k g				ng
glottal *(glottis (vocal folds))*		h			

Plosives – the flow of air is blocked and suddenly released, a bit like an ex**plosi**on. So for example, p *(labial)* is produced by closing the lips and releasing them.

voiceless	**voiced**
[p] as in pat	[b] as in bat
[t]as in tap	[d] as in dog
[k]as in cat	[g] as in got

Fricatives – the flow of air is restricted to make a hissy sound, a bit like **fric**tion.

voiceless	voiced
[f] as in fat	[v] as in vat
[θ] as in thin	[ð]as in then
[s] as in sap	[z]as in zap
[ʃ] as in shine	[ʒ]as the middle of pleasure
[h]as in hat	-

Semi-consonants are produced by keeping the vocal tract briefly in a vowel like position, and then changing it rapidly to the position required for the following vowel.

voiceless	voiced
	[w] – similar to 'oo', as in wet
	[y] – similar to 'ee', as in yet

Laterals – l is the only English lateral, and is produced by putting the tip of the tongue against the gums and letting the air pass on either side of the tongue. (Memorable because lateral = sides)

voiceless	voiced
	[l] as in let

Nasal consonants are made with the soft palate down – air passing through the nose.

voiceless	voiced
	[m] as in met
	[n] as in net
	[ŋ] as in sing

IV. Conclusion

Many consonants are far from universal. The most common consonants around the world are the three voiceless plosives [p], [t], [k] and the two nasals [m], [n]. Most English consonants can be classified using three articulatory parameters: Voicing: vibration or lack of vibration of the vocal folds. Place of Articulation: the point at which the air stream is most restricted. Manner of Articulation: What happens to the moving column of air. Consonants, unlike vowels, are speech sounds produced with a narrowing somewhere in the vocal tract. This prevents them form being loud enough to function as syllable nuclei. This is also why different people sound different when they talk. By changing the speed of the column of air, the shape of the resonator, and the kind of vibration introduced into the air stream, we produce the phonetic differences that constitute the sounds of speech.

V. Reference

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