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Criteria for the Classification of the English Consonant Phonemes

In phonetics, the English consonant phonemes are described according to four parameters, namely, place of articulation, manner of articulation, voicing and force of air. Following is a brief description of each of these aspects.

Place of Articulation

The place of articulation is determined by the speech organs involved in the production of a given sound. According to this criterion, consonant sounds are classified as follows.

1. **Labials**, if the lips are used. There are two types of labial consonants, namely:
 - a. **Bilabials**. They are consonants made with the upper and lower lips; e.g., /p,b,m/.
 - b. **Labiodentals**. They are consonants made with the lower lip and the upper front teeth; e.g., /f,v/.
2. **Dentals**, if the tip of the tongue makes contact with the upper front teeth. However, if the tip of the tongue is put between the lower and upper front teeth, the consonants are called **interdentals**. For example, /θ,ð/ can be produced with a dental place of articulation or with an interdental place of articulation.
3. **Alveolars**, if the tip of the tongue is raised toward the alveolar ridge; e.g., /t,d,s,z,l,n/.
4. **Postalveolars**, if only the rear part of the alveolar ridge is involved in the production of the consonants; e.g., /r/.
5. **Palatals**, if the front of the tongue is raised toward the hard palate; e.g., /j/.
6. **Alveopalatals** or **palatoalveolars**, if the tongue tip also rises toward the alveolar ridge and simultaneously the front of the tongue is raised toward the hard palate; e.g., /ʃ,ʒ,tʃ,dʒ/.
7. **Velars**, if the back of the tongue rises toward the soft palate; e.g., /k,g/.
8. **Labiovelars**, if the back of the tongue rises toward the soft palate and at the same time the lips are rounded to produce the consonants; e.g., /w/.
9. **Glottals**, if the sounds are made at the glottis, that is, the opening between the vocal cords; e.g., /h/.

Notice how these terms are pronounced:

Place of articulation [ˈplɛɪs əv ɑːrtɪkjəˈleɪʃn]

bilabial /bɑːlɪˈbiəl/	palatoalveolar [ˈpʰælətouæɪˈvi:lər] or
labiodental [ˈleɪbiouˈdentʃ]	alveopalatal [æɪˈviouˈpælətʃ]
dental [ˈdentʃ]	palatal [ˈpʰælətʃ]
alveolar /æɪˈvi:lər /	velar /ˈvi:lər /
postalveolar /pʰouˈstæɪˈvi:lər /	labiovelar /ˈleɪbiouˈvi:lər/
	glottal [ˈglɒtʃ] (or [ˈglɑːtʃ])

Manner of Articulation

The manner of articulation is determined by the type of closure of the air-passage produced by the movement of the flexible speech organs. According to this criterion, English consonant sounds are classified as follows.

1. **Plosives** (or **stops**), if the speech organs make a complete closure of the oral cavity and cause the air-flow to stop momentarily. When the speech organs separate, the air escapes quickly producing a slight plosion; e.g., /p,t,k,b,d,g/. There are two subtypes of plosives:

a. **Aspirated**, if the release stage of the voiceless plosives is accompanied by an extra puff of air, or aspiration¹; e.g., [p^h,t^h,k^h].

b. **Unaspirated**, if such an extra puff of air is not present; e.g., [p,t,k].

2. **Fricatives**, if the speech organs make a light contact with each other, slightly narrowing the air-passage. Such a narrowing causes the air to escape through the small opening with difficulty, producing audible friction; e.g., /f,v,θ,ð,s,z,ʃ,ʒ,h/.

3. **Affricates**, if the speech organs first make a complete closure of the air-passage, thus stopping the flow of the air momentarily, and then separate a little bit, leaving only a narrow opening for the air to escape with audible friction; e.g., /tʃ,dʒ/.

4. **Nasals**, if the speech organs make a complete closure of the air-passage in the oral cavity and the soft palate (specifically the uvula) is lowered, allowing the air to escape freely through the nasal cavity; e.g., /m,n,ŋ/.

5. **Liquids**, if the speech organs either make a partial closure of the air-passage or simply narrow it, allowing the air to escape freely without friction. When the tongue closes the center of the oral cavity, so the air can escape on one or both sides of the tongue, the sounds are called **laterals**; e.g., /l/. When the tongue tip is curled back and raised toward the rear part of the alveolar ridge, without touching it, the sounds are called **frictionless continuants** (or sometimes **retroflex**); e.g., /r/.

6. **Glides** (or **semivowels**), if the tongue moves (or glides) from one position to another during the production of a sound. During the production of glides, the tongue is raised toward the palate but without touching it, so the air passes freely through the oral cavity; e.g., /j,w/. These sounds share many characteristics with vowels (for instance, their resonance) but they function as consonants.

Some observations must be made about the manner of articulation:

a. Because of the friction or hissing noise, present during the production of the fricatives /s,z,ʃ,ʒ/ and the affricates /tʃ,dʒ/, these two types of consonants are included into the common category of **sibilants**.

b. Because the air-stream is stopped from going out through the oral cavity during the production of nasals, nasal consonants are also referred to as **nasal stops**. The other stop consonants and all the other (non-nasal) sounds are called **oral sounds** because during their production the soft palate is raised against the pharyngeal wall, closing the nasal passage and forcing the air to escape only through the oral cavity.

c. As the passage of the air is obstructed somewhere in the vocal tract during the production of stops, fricatives, affricates and nasals, these three classes of sounds are grouped into the common category of **obstruents**. However, as during the production of nasals the air can escape

¹ **Aspiration** is represented by a superscripted little 'h' [h].

freely through the nasal cavity, nasals are also considered to be, together with liquids and vowels, **continuant** (or **resonant**) **sounds**.

d. Like vowels, liquids and nasals can be prolonged and can also be **syllabic** (i.e., they can be the nucleus of a syllable); e.g., [l, r, ŋ, m, ŋ].

e. The semivowels and frictionless continuants together are usually referred to as **approximants**.

Notice how these terms are pronounced:

Manner of articulation ['mænər əv ɑ:rtɪkjə'leɪʃn]

plosive /'plɔ:sv/ or stop [stɒp]	lateral /'lætərəʔ/
fricative /'frɪkətɪv/	frictionless continuant
affricate /'æfrɪkɪt/	['frɪktʃn̩ləs kən'tɪnʃuənt]
nasal ['neɪzʔ]	approximant [ə'prɒksɪmənt]

Voicing

Voicing is determined by action of the vocal cords, that is to say, by the presence or lack of vibration of the vocal cords during the production of sounds. According to this criterion, consonants are classified into two groups, as follows:

a. **Voiced consonants**, if the vocal cords vibrate; e.g., /b, d, g, m, n, l, r, ð, dʒ, ʒ, v, z, j, w/. In certain positions (esp. word-initially and word-finally), these consonants can be **devoiced** (i.e., they lose part of their voicing). Vowels and diphthongs are also voiced sounds.

In certain word positions, the voiced consonants can become **partially devoiced**; that is to say, the vocal cords may not vibrate all the way during the production of the sounds. Partial devoicing is usually represented by a little circle beneath the phonetic symbols [◌̚], as in [b̚, d̚, m̚, ŋ̚, l̚, r̚, ð̚, dʒ̚, ʒ̚, v̚, z̚]. In some cases, the diacritic must be put on top of the symbol [◌̚̚], as in [g̚̚, ʒ̚̚].

b. **Voiceless** (or **unvoiced**) **consonants**, if the vocal cords do not vibrate; e.g., /p, t, k, θ, s, ʃ, tʃ, h/.

Notice how these terms are pronounced:

Voicing /'vɔɪsɪŋ/

voiced /'vɔɪst/	devoiced /dɪ'vɔɪst/
voiceless /'vɔɪsləs/ or unvoiced /ʌn'vɔɪst/	

Force of Air

Force of air is the strength of the breath and muscular effort used in the production of the sounds of a language. According to this criterion, consonants are classified into two groups, as follows:

a. **Fortis**, if the sounds are made with a strong force of air; e.g. [p,t,k,θ,s,ʃ,tʃ,h]. Notice that all the voiceless consonants are considered to be fortis sounds.

b. **Lenis**, if the sounds are made with a weak force of air; e.g. [b,d,g,m,n,l,r,ð,dʒ,ʒ,v,z,j,w]. Notice that all the voiced sounds are considered to be lenis sounds.

Notice how these terms are pronounced:

Force of air /'fɔ:rs_əv_ɪə/

fortis ['fɔ:rtɪs] (or ['fɔ:rɪs])

lenis /'li:nɪs/