

5. THE ENGLISH CONSONANTS

Consonants are sounds that are produced with the articulators more or less close. That is, they are produced with a **close articulation**, going from completely together to only approximating.

Consonantal sounds are classified according to three dimensions:

- a) **Voicing**
- b) **Place of articulation**
- c) **Manner of articulation**

Voicing refers to the activity of the vocal folds. When the vocal folds are wide apart, consonants are said to be **voiceless**, when they are closely together and vibrating, consonants are said to be **voiced**.

The **place of articulation** refers to that area in one of the resonating cavities (larynx, mouth) where the articulators are opposing some kind of stricture or obstacle to the passing of air.

The **manner of articulation** refers to the way the articulators are set so that the resonance effect is possible.

5.1. Place of Articulation

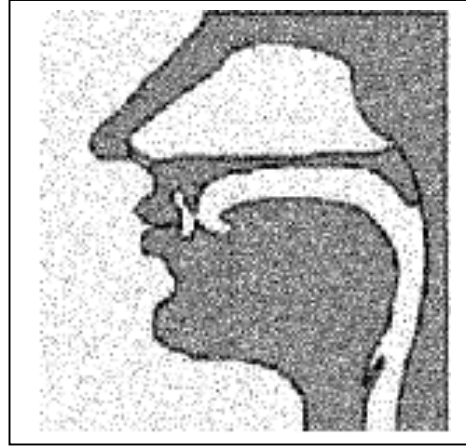
The **place of articulation** is the description of the place where the obstruction in the vocal tract takes place. To describe the place of articulation of a consonant we must state which of the lower articulators articulates with which of the upper articulators.

Bilabial:

There are three **bilabial** sounds in English: /b, p, m/ in words such as *bee, pea, me*. The first and the last are **voiced**, the second is **voiceless**. For the /b, p/ the soft palate is raised, that is, they are produced at the oral cavity only and so are defined as being **oral**, whereas /m/ is **nasal**, that is, it is produced with the soft palate being lowered which produces the air escape through the nose and mouth. As for the **place of articulation**, in the three of them the upper lip articulates with the lower lip (more specifically, producing a complete contact).

b

Example: beat, boat, big, bag



Possible positioning

- word initial as in burn, boy, boat
- word medial as in cabbage, lobby, labor
- word final as in cub, sob, cab
- Silent /b/ can occur as in limb, thumb, comb

Say 'b' to yourself a few times. Feel your neck for the vibrations that tell you that it is a voiced consonant. You can clearly feel the use of both of your lips, demonstrating that it is a bilabial sound.

Voicing: **Voiced**

Place of articulation: **Bilabial**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

p

As in pig, peat, pot, path.



Possible positioning

- word initial as in people, person, pole
- word medial (intervocalic) as in topmost, capable, gospel
- word medial (/s/ preceding) as in spin, Spain, spill
- word final as in cheap, slip, pump
- Silent /p/ can occur as in psychologist, receipt, psalm.

You should not be able to feel your throat vibrate, indicating that it is a voiceless consonant. You can clearly see that both of your lips are required to make the sound, making it a bilabial sound.

Voicing: **Voiceless**

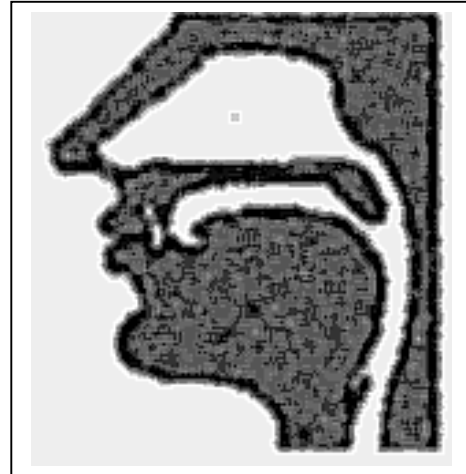
Place of articulation: **Bilabial**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

m

As in meat, mop, mat, mint.



Possible positioning

- word initial as in middle, mud, mild
- word medial as in fumble, lemon, simple
- word final as in rhythm, seem, lamb

You can feel this sound vibrate on the throat to vibrate and so is voiced. You can clearly see both of your lips being used to create the sound and so is therefore bilabial. If you hold your nose with two fingers, you will notice that the production of the sound is not possible.

Voicing: **Voiced**

Place of articulation: **Bilabial**

Manner of articulation: **Plosive**

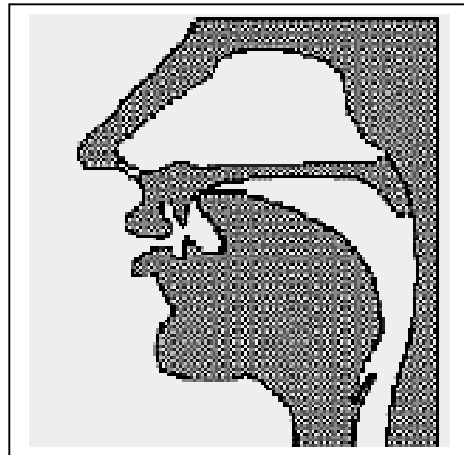
Position of the soft palate: **Nasal**

Alveolar:

There are six **alveolar** consonants in English: /d, t, z, s, n, l/ as in *take, day, see, zoo, never* and *later* (the last one is **lateral**). Of the group, /t, s/ are **voiceless** and the rest /d, z, l, n/ are **voiced**. As for the **place of articulation**, the **tip of the tongue** (the **blade of the tongue** for some speakers) articulates with the alveolar ridge, therefore, these consonants are actually described as being **apico-alveolar** or **laminal** (depending on the part of the tongue which participates in the articulation).

d

As in dog, dip, day, deer.



Possible positioning

- word initial as in dog, dear, dish
- word medial as in middle, admit, badly
- word final as in third, mad, old

You can feel that your throat vibrates as you say the letter, so it is voiced. You should be able to feel your tongue touch the alveolar ridge, making it an alveolar sound. And, you can feel a small explosion of air on your hand if you hold it in front of your mouth, which demonstrates that it is a plosive sound.

Voicing: **Voiced**

Place of articulation: **Alveolar**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

t

as in tin, tear, top, tank.



Possible positioning

- word initial as in town, take, talk
- word medial as in fatal, steak, butter
- word final as in but, fit, boat

You can clearly feel your tongue touch the alveolar ridge and the distinct explosion of air that marks it as being plosive.

Voicing: **Voiceless**

Place of articulation: **Alveolar**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

Z

As in zoo, zip, zeal, zone.



Possible positioning

- word initial as in zest, zinc, Zulu
- word medial as in easy, bosom, lazy
- word final as in has, was, does

This sound is very clearly a voiced sound. It is the voiced equivalent of /s/. You can feel air being forced through the tongue and the alveolar ridge, meaning that it is a fricative being articulated at the alveolar.

Voicing: **Voiced**

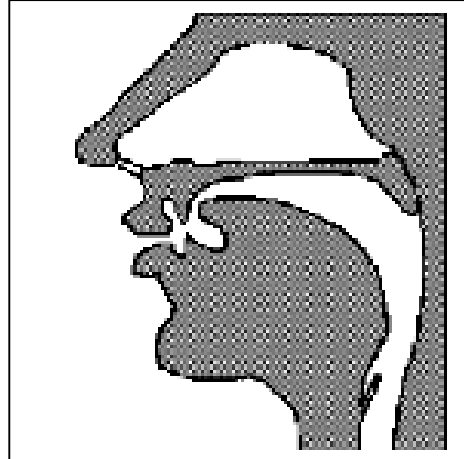
Place of articulation: **Alveolar**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

S

As in song, sip, soap, seat.



Possible positioning

- word initial as in seal, cease, sit
- word medial as in essay, escape, pencil
- word final as in pass, goose, famous

This sound is totally voiceless. You should be able to feel air being forced between the tongue and alveolar ridge. The fact that there is friction means that it is a fricative, being articulated in the alveolar region.

Voicing: **Voiceless**

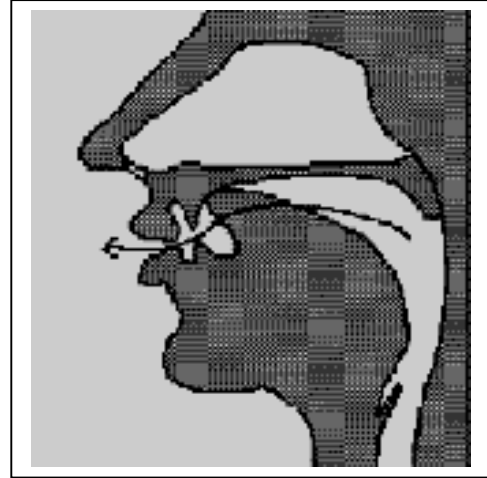
Place of articulation: **Alveolar**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

l

As in little, low, long, leaf.



When you say /l/, you should be able to feel the air flowing over the sides of the tongue, indicating that it is a lateral sound.

/l/ is divided into two distinct sounds: the dark /l/ and the clear /l/. If you say *little*, you should be able to hear the difference between the first and the second /l/.

In both the light and dark /l/, the tip of the tongue is in contact with the alveolar ridge. The difference between the two stems from the position of the back of the tongue. In the light /l/, the back of the tongue is in a more forward position. In the dark /l/, the back of the tongue is further back in the mouth.

/l/ is usually voiced, but if it comes after a voiceless plosive, such as /p/ or /k/, then /l/ is devoiced. Try saying *play* and *clip*.

Voicing: **Voiced**

Place of articulation: **Alveolar**

Manner of articulation: **Lateral**

Position of the soft palate: **Oral**

n

as in nice, nip, note, near.



Possible positioning:

- word initial as in kneel, nail, nose
- word medial as in inside, thinker, dinner
- word final as in fin, pen, down

If you put your fingers on your throat, you should be able to feel vibration, indicating voice. You should also be able to feel your tongue against your alveolar ridge, indicating that it is an alveolar sound. If you hold your nose with two fingers, you will notice that the production of the sound is not possible.

Voicing: **Voiced**

Place of articulation: **Alveolar**

Manner of articulation: **Stop**

Position of the soft palate: **Nasal**

Velar:

Velar sounds are produced with the back of the tongue against the **soft palate**. They are actually called **dorso-velar**. There are three velar sounds in English: /g, k, ŋ/, the first one is **voiceless**, the last two are **voiced**. The last one is **nasal**. Examples are: *queen, gain*, and the last sound in *sing*¹.

g

As in: goat, girl, gone, got.



Possible positioning

- word initial as in goat, god, grapefruit
- word medial as in figure, begin, angry
- word final as in rug, dog, vague

This letter is the voiced version of /k/. Switching between the two, you should be able to feel the voice of /g/. It is easy to tell that the sound is being made at the back of the throat. It might also be possible for you to feel the back of your tongue touching the soft palate as you make the sound.

Voicing: **Voiced**

Place of articulation: **Velar**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

¹ The consonant /ŋ/ only appears in final position.

k

As in king, cot, caught, key.



Possible positioning

- word initial as in catch, keep, close
- word medial as in baker, secret, equal
- word final as in back, desk, duck

This sound is the voiceless equivalent of /g/. The place of articulation should be felt as being the soft palate at the back of your mouth.

Voicing: **Voiceless**

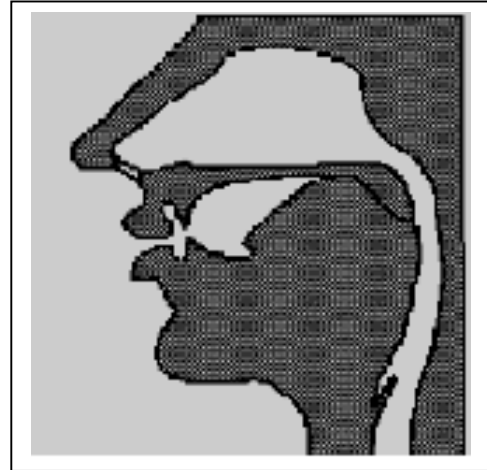
Place of articulation: **Velar**

Manner of articulation: **Plosive**

Position of the soft palate: **Oral**

ŋ

as in hang, song, thing, singer.



Possible positioning

- This sound does not appear in word initial positions in RP
- word medial as in singer, longing, hanger
- word final as in bang, wrong, tongue

This sound is never found at the beginning of a word. It is a voiced sound made by the back of the tongue stopping against the soft palate. If you place your finger in front of your nose, you should be able to feel the expulsion of air through your nose, which makes it a nasal consonant.

Voicing: **Voiced**

Place of articulation: **Velar**

Manner of articulation: **Plosive**

Position of the soft palate: **Nasal**

Labiodental:

There are two **labiodental** sounds in English: /v/ and /f/ in *veal, laugh*. The first one is **voiced**, the second **voiceless**. In the production of these two consonants, the **lower lip** articulates with the **upper teeth**, barely touching each other. Both are **oral**.

V

As in vine, veal, vault, vote.



Possible positioning

- word initial as in vast, vain, voice
- word medial as in ever, over, silver
- word final as in behave, groove, of

The sound can be clearly felt to have voice, if you put your fingers on your throat. You should also be able to feel the air being squeezed past your lower lip and upper front teeth, indicating that /v/ is a labio-dental, fricative.

Voicing: **Voiced**

Place of articulation: **Labiodental**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

f

As in fine, feel, fur, foot.



Possible positioning

- word initial as in first, final, flip
- word medial as in defend, affair, selfish
- word final as in laugh, loaf, roof

There is no vibration in the throat whatsoever, indicating that the sound is voiceless. You can feel that your top teeth are touching your lower lip, and so is a labio-dental sound. Finally, you should be able to feel the friction of the air as it forces its way between the lips and teeth, and this is what is called a fricative.

Voicing: **Voiceless**

Place of articulation: **Labiodental**

Manner of articulation: **Fricative**

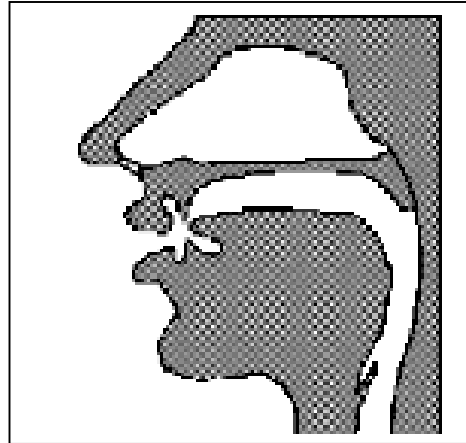
Position of the soft palate: **Oral**

Dental:

Two **dental** sounds occur in English: /ð/ and /θ/ (**voiced** and **voiceless**, respectively), in words such as *teeth* and *they*. They are **oral**. They are actually defined as being **apico-dental** sounds, as the **tip of the tongue** (lower articulator) articulates with the **teeth**. In this case, the articulation implies a very soft contact between the two articulators.



As in the, this, that, thy.



Possible positioning

- word initial as in *though, there, they*
- word medial as in *within, leather, father*
- word final as in *with, soothe, see the*

If you feel your throat, you should be able to detect the vibrations of a voiced consonant. You can also feel your tongue tip acting against your upper front teeth. The fact that air is forced between the tongue and the teeth means that it is a fricative consonant.

Voicing: **Voiced**

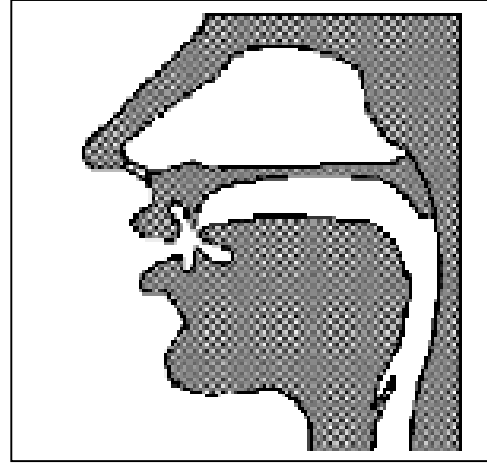
Place of articulation: **Dental**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**



As in think, thigh, thought, thank.



Possible positioning

- word initial as in think, thirst, thin
- word medial as in ether, lethal, author
- word final as in heath, path, cloth

You cannot feel any vibration of the throat indicating that it is a voiceless sound. You can feel air being forced between the tip of your tongue and your upper front teeth. Any sound articulated at the teeth is a dental sound, whereas any sound that is created by creating friction by forcing air through a narrow channel is known as a fricative.

Voicing: **Voiceless**

Place of articulation: **Dental**

Manner of articulation: **Fricative**

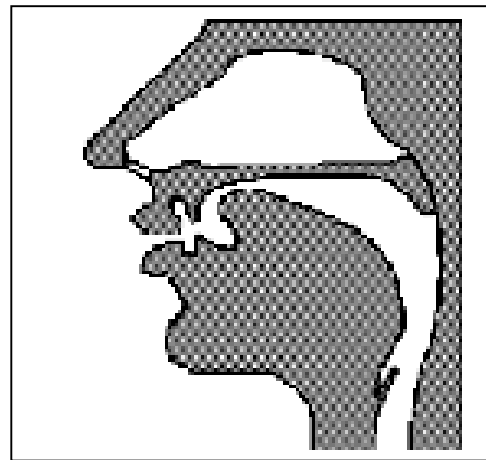
Position of the soft palate: **Oral**

Palato-alveolar:

There are four palato-alveolar sounds in English: /ʃ, ʒ, tʃ, dʒ/². For the first two, the blade of the tongue is arched near the alveolar area with a simultaneous approximation of the front of the tongue towards the hard palate. Examples are *shoe* and *genre*. For the last two sounds, besides the close approximation of the front part of the tongue towards the hard palate, the blade of the tongue comes in contact with the alveolar area and then separates progressively. Examples are the first consonants in *chair* and *John*. According to the part of the tongue that participates in the articulation, these sounds are, then, **laminal**.

ʃ

as in ship, shape, sheep, shop.



Possible positioning

- word initial as in shop, sheep, shirt
- word medial as in fissure, mission, bishop
- word final as in wish, cash, finish

This sound clearly carries no voice. However, it is quite difficult to differentiate where in the mouth it is articulated. It seems to be between the alveolar ridge and the hard palate and so some people call it a palato-alveolar. As the sound is being forced between the tongue and the palato-alveolar, it is a fricative

Voicing: **Voiceless**

Place of articulation: **Palato-alveolar**

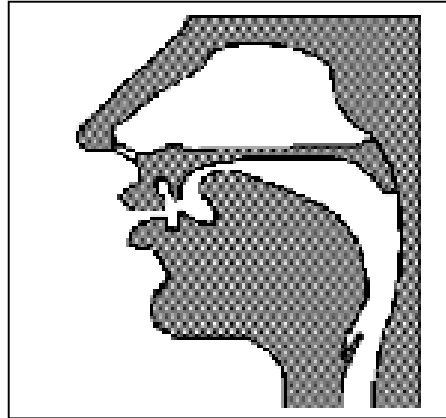
Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

² Instead of IPA symbols, some authors use /š, ž, č, ĵ/ for /ʃ, ʒ, tʃ, dʒ/

ʒ

As in genre, measure, leisure, seizure.



Possible positioning

- word initial (in French loan words) as in gigolo, genre
- word medial measure, usual, confusion (early French loan words)
- word final (in recent French loan words) as in prestige, rouge, beige

Placing your finger over your throat, you can clearly feel the vibration of voice. The position of the tongue is somewhere around where the hard palate and the alveolar ridge meet, making it a palato-alveolar consonant. You should also be able to feel the air being forced between the tongue and the palato-alveolar ridge, making it a fricative. This sound is usually found in the middle of English words, but is also often heard at the beginning of foreign loan words found in English (e.g. gendarme, Jean Paul).

Voicing: **Voiced**

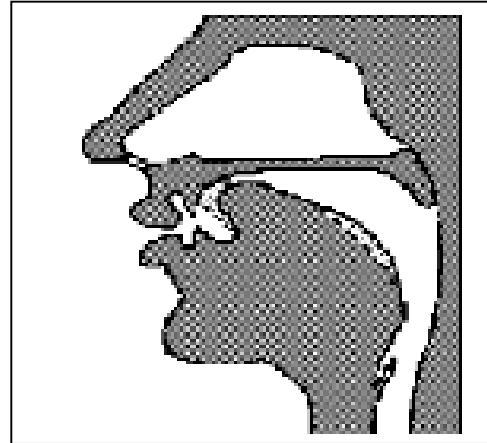
Place of articulation: **Palato-alveolar**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

ts

As in cheap, chair, Charles, chomp.



Possible positioning

- word initial as in cheese, cheap, charm
- word medial (intervocalic) as in richer, nature, feature
- word medial (consonant preceding) as in mischief, juncture, capture
- word final (intervocalic) as in catch, much, coach
- word final (consonant preceding) as in bench, branch, inch

If you place your hand on your throat you can clearly feel that this sound carries no voice. Also, the fact that it is a fricative means that the tongue is spread over the hard palate and the alveolar ridge making it a palato-alveolar sound.

Voicing: **Voiceless**

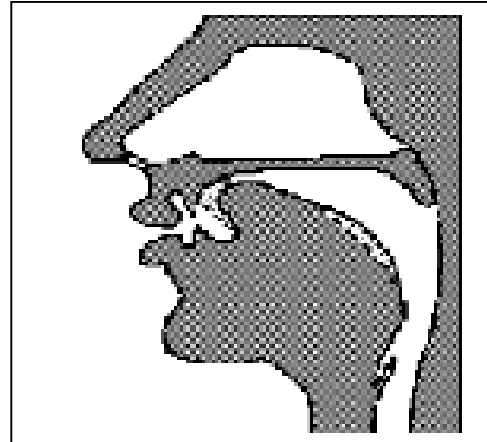
Place of articulation: **Palato-alveolar**

Manner of articulation: **Affricate**

Position of the soft palate: **Oral**

dʒ

As in jeep, gesture, joust, jump.



Possible positioning

- word initial as in jest, jar, jerk
- word medial (intervocalic) as in midget, fragile, urgent
- word medial (consonant preceding) as in danger, soldier, object
- word final (intervocalic) as in ridge, large, age
- word final (consonant preceding) as in change, sponge, hinge

This sound is the voiced equivalent of the /tʃ/ sound. The fact that it is a fricative means that the tongue is spread over the hard palate and the alveolar ridge making it a palato-alveolar sound.

Voicing: **Voiced**

Place of articulation: **Palato-alveolar**

Manner of articulation: **Affricate**

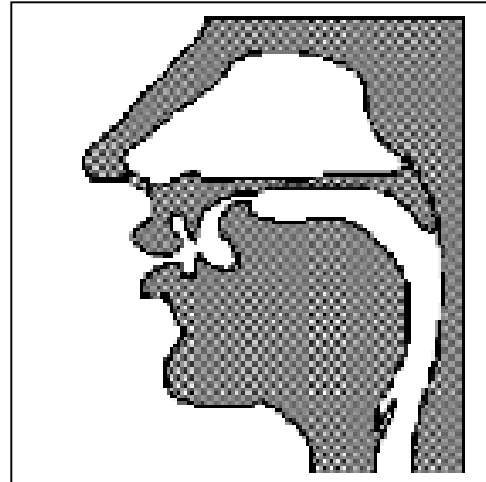
Position of the soft palate: **Oral**

Retroflex:

There is one **retroflex** sound in English, the first sound in *red* /ɹ/ or /r/. Retroflex means that the tip of the tongue (therefore, an **apical** sound) is curled up and back towards the rear part of the alveolar ridge³. In this sense, the sound could also be considered **postalveolar** (the **Postalveolar** area is right behind the alveolar ridge, on the border of the hard palate), but the special position of the tongue gives it its **retroflex** characteristic. The tip of the tongue does not touch the upper articulator, there is only approximation⁴.



As in red, road, wrong, read.



Possible positioning

- word initial as in rope, real, rob
- word medial as in mirror, very, arrow
- word final as in far, poor, here but only when the next sound is a vowel.

/r/ is a very tricky consonant. Many people think that /r/ is still rolled in the mouth: although this could be said about Scottish English, it is not true of RP. The tongue-tip is fairly close to the back of the alveolar ridge with the sides of the tongue in contact with the sides of the palate.

/r/ is not pronounced when it comes before a consonant (even if it is written). The same is true if /r/ comes at the end of a word. So, it is only pronounced if the following word begins with a vowel.

Voicing: **Voiced**

Place of articulation: **Postalveolar**

Manner of articulation: **Retroflex, approximant**

Position of the soft palate: **Oral**

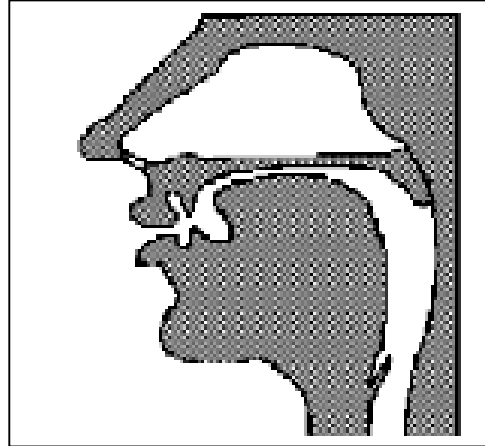
³ Some speakers make what we call a **bunched** /ɹ/, meaning that the tip of the tongue is kept down, and it is the body of the tongue that is pulled up and back.

⁴ The symbol /r/ also represents a **trill** (as in Spanish *río*).

Palatal:

Palatal sounds are made with the front of the tongue articulating against the **hard palate**. There is one palatal sound in English: /j/ in words such as *yes, yesterday, yawn*⁵.

j



Possible positioning

- word initial as in *year, young, you*
- word medial as in *lawyer, beauty, value*

This may look like a /j/ sound, but it is the phonetic representation of the /y/⁶ sound. It is a semi-vowel, having some of the qualities of a vowel and of a consonant. It seems to start like the vowel /i/ before moving to a more obstructionist sound traditional of the consonants. This symbol is known as the “yod” or “jod”.

Voicing: **Voiced**

Place of articulation: **Palatal**

Manner of articulation: **Approximant**

Position of the soft palate: **Oral**

⁵ Sometimes the alveolar sound /l/ is also pronounced as a palatal one.

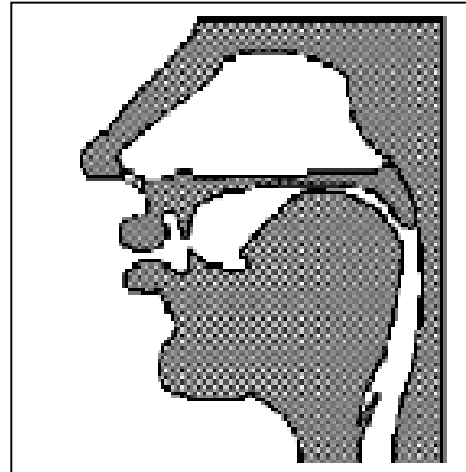
⁶ This sound is represented like /y/ in the American English tradition.

Labial-velar:

As the palatoalveolar consonants, the sound /w/ has a **double place of articulation**, meaning that it is produced at the **labial** and the **velar** area. For the production of this consonant, the **lips** get approximated at the same time that the back of the tongue and the soft palate get near. Examples are *wet* and *nowhere*. It is considered **voiced**⁷.

W

As in win, witch, wall.



Possible positioning

- word initial as in weather, watch, worth
- word medial as in twig, twelve, queen
- This sound doesn't appear in word final positions in RP

This consonant is also known as a semi-vowel. The articulation of this letter makes it sound as if it starts out as the /u/ vowel before becoming an obstruction of the airflow. The obstruction never causes enough friction to make it sound like a fricative.

Voicing: **Voiced**

Place of articulation: **Labial-velar**

Manner of articulation: **Approximant**

Position of the soft palate: **Oral**

⁷ In GA, there exists a **voiceless** counterpart /w̥/, which establishes the distinction between *wet* and *whet* (the first one being voiced, the second one voiceless). That distinction is not present in RP.

Glottal:

There is only one **glottal** sound in English /h/ in words such as *hen*, *ahead*. Glottal refers to the glottis, where this consonant is produced by the close contact of the **vocal folds** that produce friction. The sound is ordinarily produced as a voiceless vowel, but it functions as a consonant. We say that is actually produced as a vowel because in its articulation there is no obstruction in any of the resonators (more specifically the oral cavity) and, thus, can be paired with any other vowel. However, this consonant never functions as a vowel, whose main position is that of being central in the syllable. English /h/ can only appear in syllable initial position, more common at the beginning of the word and rarely in the middle: *he*, *his*, *hate*, *how*, *who*, *anyhow*.



As in: hot, hotel, hole, happy.

Possible positioning

- word initial as in heart, heal, help
- word medial as in behave, ahead, adhere
- Does not appear in word final positions

This sound carries no voice. You should be able to feel that the sound comes from the very back of your mouth. In fact, it is articulated by the glottis, which is as far back as you can get. Being so far back, it is hard to feel that the air is being forced through the vocal cords as a fricative.

We can show no sagittal section representation of the sound because it is produced at the glottal area.

Voicing: **Voiced**

Place of articulation: **Glottal**

Manner of articulation: **Fricative**

Position of the soft palate: **Oral**

There is a **glottal** plosive sound in English, but it is not characteristic of the language, only of a specific accent. It is, therefore, considered an **allophone**: [ʔ] in Cockney (south of London). The production of the consonant takes place at the glottis, being the **vocal folds** the articulators that get in contact, presenting an obstacle to the outgoing airflow. Many English speakers use a **glottal stop** in expressions like *uh-oh*.

To account for every place of articulation, three areas can be distinguished:

- a) **Labial**: bilabial, labiodental, labial-velar
- b) **Coronal**: dental, alveolar, postalveolar, palatoalveolar, retroflex
- c) **Dorsal**: palatal, velar, labial-velar

5.2 Manner of Articulation

Manner of articulation means the way the articulators are positioned in shaping the vocal tract, that is, the **degree of constriction** that the articulation represents.

Stops⁸:

A **stop** involves a complete closure of the articulators, preventing the escape of the air. After the closure, there is a release stage. English shows six oral stops (of which the first element in the couple is voiceless and the second voiced) /p, b/ (**bilabial**) /t, d/ (**alveolar**) and /k, g/ (**velar**), and three **nasal stops**⁹ /m, n, ŋ/ (**bilabial, alveolar** and **velar**). In the case of the oral stops, the escape can only be possible when the obstacle disappears, while for nasal ones the escape is already taking place through the nose because the soft palate is kept in its lowered position.

⁸ Also known as **plosives**

⁹ All of the nasal stops are **voiced**

Fricatives:

Fricatives are sounds that are produced with a close approximation between the articulators, which allows the air to escape with some friction. The escaping air is turbulent and is called **frication**. The following consonants are fricative in English: /f, v, θ, ð, s, z, ʃ, ʒ, h/. It is important to remember that frication does not mean a complete closure, so it is the next degree of constriction in the way articulators are set.

Approximants:

After frication, articulators can become approximated, without producing any kind of friction, nor contact. **Approximant** consonants in English are: /l, r, w, j/. All approximants in English are **voiced**.

/r/ is a **retroflex** sound and /l/ has been described as an alveolar. However, we must add that it is an **alveolar lateral**, which means that, while the tip of the tongue is touching the alveolar ridge, the escaping air is released through both sides of the tongue being left separated from the hard palate. This position gives the sound its "laterality".

As we have seen, the consonants /w, j/ are considered **approximants** and **glides** at the same time. Although they function as consonants, they are phonetically moving vowels. For some authors, they have different behaviors. For example, /w, j/ function as consonants when they form the first sound in the syllable (*wet*) but they function as vowels when they appear in the center of the syllable, preceded by another consonant and accompanying another vowel, for example in *tune*.

Affricates:

Affricates are the sequences of stop plus fricative. The articulators get together and then the release stage is done progressively (not suddenly, as in the case of stops), producing friction. The affricate sounds in English are /tʃ, dʒ/ (voiceless and voiced) in words such as *church* and *Janet*. Affricates must be considered a single consonant, despite the fact that an affricate implies the combination of two articulatory sequences.

Nasals:

Nasal sounds happen when there is velic opening and there is a complete obstruction at some point in the mouth so that the airflow escapes only through the nose. We will consider nasal consonants as a distinctive type of articulation. That means that all other manners of articulation previously mentioned are actually oral sounds, where velic

opening does not take place because the soft palate is raised. Nasals are really **nasal stops**, /m, n, ŋ/ (**bilabial**, **alveolar** and **velar**) representing the counterpart of **oral stops** /p, b/ (**bilabial**) /t, d/ (**alveolar**) and /k, g/ (**velar**). The difference between oral and nasal stops lies in the fact that when nasality takes place the escape is still possible, despite the closure that takes place in the oral cavity.

5.3 Further classification

We have said that consonants are sounds produced with a more or less **degree of constriction** in the passage of air out of the oral cavity (with the exception of the /h/ sound). This constriction actually stays for the closing of the articulators that shape the resonators and give each sound its distinctive quality. At the low level of this constriction we find stops, fricatives and affricates, which are usually called **obstruent** sounds for that reason. Above on the scale we have **non-obstruent** sounds, also known as **sonorant**: nasal stops, approximants, glides and vowels. This scale represents the energy that is emitted by the production of each sound. It is easy to understand that the more open the articulation is the more energy is expelled and, as a result, the more sonorant the sound will be perceived by the listener. That is why this so-called **sonority scale** (also **sonority hierarchy**) includes every single type of sound in the language, not only consonants but also vowels.

Sonority refers to the relative loudness of sounds. If we look at the waveform of the word *loving*¹⁰, we can easily see that the intensity (which we perceive as loudness) of the vowels is much greater than that of the neighboring consonants. We find two articulatory factors that generally contribute to this sonority: an open vocal tract and voicing. When we perceive greater sonority we say that that sound has a greater **prominence**, that is, more sonorant sounds stand out and are perceptually more prominent than their neighbors.

The following table shows an approximation to this sonority scale together with a possible sonority index for each English sound.

¹⁰ The waveform of a sound can be visualized with many computer programs.

<u>Sound</u>	<u>Sonority index</u>
Low vowels	10
Mid vowels	9
High vowels	8
glides	7
r, l	6
Nasal stops	5
Affricates	4
Voiced fricatives	3
Voiceless fricatives	2
Voiced stops	0.5
Voiceless stops	0

Other classifications include that of **sibilants** for /s, z, ʃ, ʒ/ and **liquids**, which comprise laterals and r-like sounds /l, r/.