

# Acoustic Phonetics

## More on consonants

### Lesson 8

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## Fricative Consonants

- Fricative sounds are produced when the articulators are brought so closely together that the air passing through the mouth produces audible friction
  - *fie, vie* (lower lips and upper teeth)
  - *thigh, thy* (inter dental)
  - *sigh, zoo* (front of the tongue and alveolar region)
  - *shy* (central tongue and central palate).

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## English fricative consonants

English Consonants									
		Bila bial	Labi- dental	Inter- dental	Alveo lar	Post- Alveo lar	Pala tal	Velar	Glottal
<b>Stop</b>	vl. vd.	[p] [b]			[t] [d]			[k] [g]	
<b>Affricate</b>	vl. d.					[tʃ] [dʒ]			
<b>Fricative</b>	vl. vd.		[f] [v]	[θ] [ð]	[s] [z]	[ʃ] [ʒ]			[h]
<b>Nasal</b>		[m]			[n]			[ŋ]	
<b>Approx.</b>		[w]			[l]	[r]	[j]		

Fricative consonants are shown in red

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## Italian fricative consonants

Italian Consonants									
		Bila bial	Labi- dental	Dental	Alveo lar	Post- Alveo lar	Pala tal	Velar	Glottal
<b>Stop</b>	vl. vd.	[p] [b]			[t] [d]			[k] [g]	
<b>Affricate</b>	vl. d.					[tʃ] [dʒ]			
<b>Fricative</b>	vl. vd.		[f] [v]		[s] [z]	[ʃ] [ʒ]			
<b>Nasal</b>		[m]			[n]		[ɲ]		
<b>Approx.</b>		[w]			[l]	[r]	[j]		

Fricative consonants are shown in red

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## Labiodental and Alveolar fricatives

/f, v, s, z/

- Have the same place of articulation of Italian /f, v, s, z/

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## Labiodental and Alveolar fricatives

- /s/ is pronounced voiceless even if followed by a (voiced) nasal or approximant (i.e. /n, m, l, w/):  
ex.: *smoke, snail, slow, sweet*, etc.
- Before /n, m, l/ Italians produce it as a **voiced** sound ex.: [z]*moke, [z]nail, [z]low*, etc.

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## How is the –s suffix pronounced?

- [ɪz] after [s], [z], ‘-ce’, ‘-ss’, ‘-x’, ‘-ch’, ‘sh’, ‘-(d)ge’  
ex.: *roses, houses, distances, boxes, masses, matches, bushes, etc.*
- [s] after voiceless consonant  
ex.: *stops, caps, desks, meats, paints, laughs, booths, etc.*
- [z] elsewhere  
ex.: *shoes, pays, pubs, gloves, dogs, queens, pens, tables, chairs, etc.*

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## How are these words pronounced?

- |         |         |
|---------|---------|
| • peace | • peas  |
| • Ice   | • eyes  |
| • false | • falls |
| • pence | • pens  |
| • gross | • grows |

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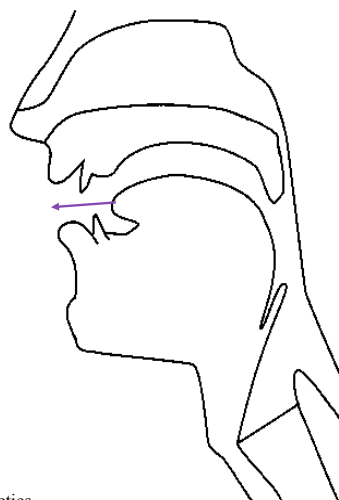
## How is the –s suffix pronounced in these words?

- rib
- friend
- bid
- whale
- cigar
- hen
- bush
- stove
- buck
- bucket
- regret
- tip
- mask
- smoke
- plan
- phone
- typo
- measure
- pump
- kiss
- bag
- author
- wrapping
- dean
- creation
- cusin
- fly
- pea
- apple
- lemon
- glass
- beer
- job
- option
- complaint

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## Interdental Fricatives

- /θ, ð/
  - Both are written ‘th’ in English
  - Not difficult to make, but learners may be embarrassed to show tongue for their production
  - correct pronunciation (often implying showing one’s tongue...) may be avoided
  - often replaced with /f/ and /v/ by Italian learners (by /s/ and /z/ by French and German speakers).



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## /h/

- Italians can produce this sound, but tend not to produce it in English words.
- When they make it, they often make it [h] before vowels where [h] should not be pronounced and viceversa

- Ex.: I have an apple /hai ɛv hɛn hɒpəl/

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What can happen when you don't pronounce 'th' correctly?

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Watch for fun...

<http://www.youtube.com/watch?v=GT86iWiH2mI&NR=1>

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## Affricate Consonants

- Remember what we said about stops?  
(see next slide)

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## Release phase of the pressure build-up

- The release can be:
  - **With a burst**: when the release of the articulatory muscles is very abrupt. Ex. [p, t, k] in Italian.
  - **unexploded**: the release is not abrupt. Typical of English word final position: es. [kipʰ]
  - **aspirated**: the release occurs with a puff of air. Typical of English. Ex.: [pʰen]
  - **delayed**: the release is very slow and the air comes out with friction. Gives rise to **affricated** consonants: [pf, ts, ks, ecc.]



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## Affricate Consonants

- /tʃ, [dʒ]/
- Postalveolar in both English and Italian
- Misleading orthography:
  - /tʃ/ : 'ch', '-tch', '-t'+ 'ure'
  - chin, chair, rich, coach,
  - match, catch, kitchen,
  - nature, culture, future
  - /dʒ/ : 'j', 'g' + 'e' o 'i', '-dge'
  - jam, job, John, Jack
  - general, manage, agent,
  - ginger, magic, imagine
  - judge, lodge, edge

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## English and Italian Nasal sounds

- /m/
  - is similar to Italian /m/
- /n/
  - is alveolar in English and dental in Italian
- /ŋ/
  - has no parallel in Italian. It is a velar nasal in English, Italians tend to produce it as a sequence of /n/ + /g/
- /[ɲ]/
  - Italian palatal nasal, not present in English

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## Characteristics of English Nasal sounds

- both /m/ and /n/ are syllabic in English, i.e., they take on a vowel-like pronunciation
  - no full vowel should be pronounced in words like *open*, *botton*, *Manhattan*, etc.

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## Nasal Plosion

- Release of the oral stop closure by opening up the velo-pharyngeal port.
- The release burst caused thereby is referred to as nasal plosion.
  - Peter says hidden, sadden, sudden, leaden
    - » with nasal plosion
    - » without nasal plosion

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## Nasal plosion in English

- <http://linguistics.berkeley.edu/acip/course/chapter3/nasal.htm>

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## Approximants

- Approximants are produced when by the vocal organs are close enough to create an audible turbulence, but without any friction.
- All approximants are voiced.
- As they are relatively open, they are also vowel-like, and the vocal organs regularly adopt the position of the following vowel when the approximant is being formed.

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## English approximants

English Consonants									
		Bilabial	Labiodental	Interdental	Alveolar	Post-Alveolar	Palatal	Velar	Glottal
<b>Stop</b>	vl. vd.	[p] [b]			[t] [d]			[k] [g]	
<b>Affricate</b>	vl. d.					[tʃ] [dʒ]			
<b>Fricative</b>	vl. vd.		[f] [v]	[θ] [ð]	[s] [z]	[ʃ] [ʒ]			[h]
<b>Nasal</b>		[m]			[n]			[ŋ]	
<b>Approx.</b>		[w]			[ɹ]	[r]	[j]		

Approximants are shown in red

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## English approximants

English Consonants									
		Bila bial	Labi- dental	Inter- dental	Alveo lar	Post- Alveo lar	Pala tal	Velar	Glottal
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<b>Nasal</b>		[m]			[n]			[ŋ]	
<b>Approx.</b>		[w]			[l]	[r]	[j]		

Approximants are shown in red

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## Italian approximants

Italian Consonants									
		Bila bial	Labi- dental	Dental	Alveo lar	Post- Alveo lar	Pala tal	Velar	Glottal
<b>Stop</b>	vl. vd.	[p] [b]		[t] [d]				[k] [g]	
<b>Affricate</b>	vl. d.					[tʃ] [dʒ]			
<b>Fricative</b>	vl. vd.		[f] [v]	[θ] [ð]	[s] [z]	[ʃ] [ʒ]			[h]
<b>Nasal</b>		[m]		[n]				[ŋ]	
<b>Approx.</b>		[w]			[l]	[r]	[j]		

Approximants are shown in red

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## w, r, l, (t)

- In all of these sounds there is very little contact of the tongue with the palate (the articulators come close but do not really touch)

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## /w/

- **/w/** in wind, whisky, wine, wept
  - Is a bilabial sound
  - It is similar to the Italian sound in words like **uovo**.
  - However, in Italian, /w/ does not occur before /i, e, a/ or /r/. In these contexts, Italian has /v/
    - In these contexts Italian tend to produce this sound as a /v/

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### Difference between /v/ and /w/

- /w/ = bilabial = produced with no contact of the lower teeth with the lips, only the lips are coming closer
- /v/ = labiodental = produced with the lower teeth touching the upper lips

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### Try and Compare

- would, win, waste, wrap, write, wrong
- vine      wine
- veil      whale
- vest      west
- vane      wane
- vault      Walt

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## /r/

- /r/ in right, ring, rose, ready
- In **English**, this sound is post-alveolar and not a vibrant
  - the tongue is pushed back and low and does not touch the palate, while the lips come close together
- In **Italian**, this consonant is produced by rolling the tongue against the palate and letting it vibrate by letting the air passing through it
  - can be a monovibrant or a plurivibrant (alveolar trill)

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## Taps and Flaps

There is a technical distinction made between taps and flaps.

- **Tap:**
  - strictly up and down movement, with brief contact between articulators.
  - Spanish: [karo] “expensive”
- **Flap:**
  - brief contact during backwards or forwards movement of an active articulator.
  - N.A. English: “ladder” or “latter”

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## Try and Compare

- right, really, rip, ready, read
- risk      brain      very      card
- rest      three      Europe      party
- ring      wrong      correct      mark
- Russia country      Paris      burn
- right      free      story      pork

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## //

- // in love, light, milk, filter
- English // can be pronounced in two different ways:
  - It is alveolar if it is at the beginning of a word
  - It is 'velar' (produced with the back of the palate if it is in syllable-final or word-final position)

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## Lateral plosion

- The release of a plosive by lowering the sides of the tongue, as at the end of the word *saddle*, *bottle*

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## Syllabic /l/, /r/

- The liquids /l, r/ are syllabic at the end of a word when immediately after a consonant (*paddle* [pædl] *hammer* [hæmr].)

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### Try and Compare

- light, loose, milk, feel, meal
- let        milk
- leave     help
- hello     bill
- lovely    feel
- slow      beautiful
- black     special

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### Note on //

- Orthographic 'l' is not pronounced in the following words:
- Talk
- Walk
- Palm
- Calm

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### Intervocalic /t/ or /tt/

- Orthographic 't' or 'tt' occurring after a stressed vowel sound in a multi-syllable word is produced with a very short contact of the tip of the tongue and the front palate
- This sound is similar to some forms of our Italian /r/ in words like 'caro', 'vero'

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### Try and Compare

- city, butter, pity, water
- But                      butter
- Cut                      cutter
- Bit                      bitter
- Sit                      city
- Pat                      patty
- Write                      writer

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