

CHAPTER 6

PHONETICS: THE SOUNDS OF LANGUAGE

Phonology vs. Phonetics

“Phonology is the study of the system underlying the selection and use of sounds in the languages of the world.” (Kenstowicz and Kisseberth 1979)

“Phonology is the study of the function and patterning of speech sounds.” (Dalbor 1997)


English: plural formation

- dog[z] (dogs)
- cat[s] (cats)
- fish[iz] (fishes)

Nasal Assimilation (when one sound undergoes a change when it comes in contact with another) in Spanish

- e[m] barco (en barco)
- so[ŋ] grandes (son grandes)

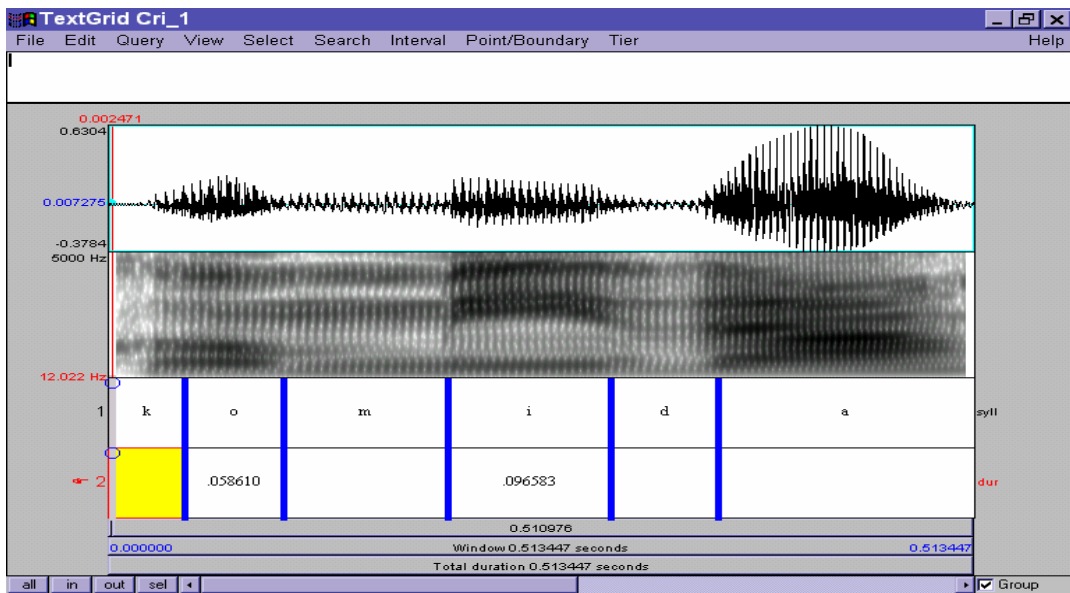
Nasal Assimilation in French

- agneau (agneau)* 

Phonetics: It is the study of the quality of individual sounds, how they are produced, how they are transmitted, and how they are interpreted.

- “The study of the sounds human beings employ when speaking a language is phonetics.” (Kenstowicz and Kisseberth 1979)
- “Phonetics is the study of the quality of individual sounds, exactly how they are produced by the human vocal mechanism, how they are transmitted as sound waves, and how they are interpreted by the listener.” (Dalbor 1997)

Example: ‘comida’



The study of the physical properties of sounds themselves is **acoustic phonetics**.

The study of the way listeners perceive these sounds is **auditory phonetics**.

In chapter 6, we study **Articulatory Phonetics**, the study of how the vocal tract produces the sounds of language.

SPEECH ORGANS

- 1) Path of Airstream (diagram)
- 2) Anatomical Structures important in speech

ORGANS OF ARTICULATION

1. trachea
2. larynx (voice box)
3. vocal bands
4. pharynx
5. oral cavity
6. nasal cavity
7. nostrils
8. uvula
9. velum (soft palate)
10. palate
11. alveolar ridge
12. upper front teeth
13. upper lip
14. root of the tongue
15. dorsum or back of tongue
16. blade of tongue
17. tip of the tongue
18. lower front teeth
19. lower lip
20. wall of the pharynx
21. epiglottis
22. esophagus

SPEECH ORGANS

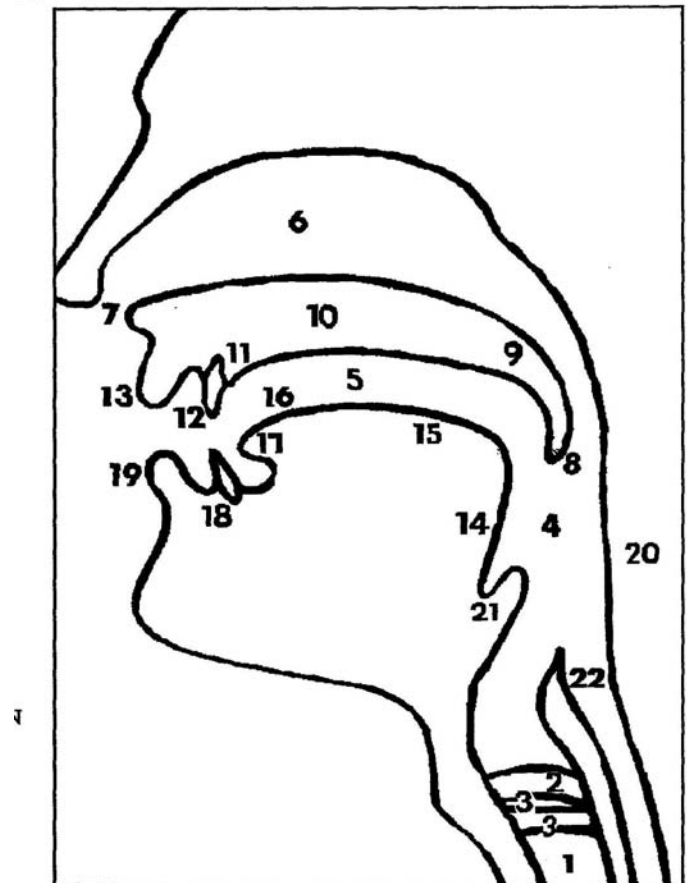


Figure 1 Organs of Articulation

View anatomy online:

www.uiowa.edu/~acadtech/phonetics

Women:

- Tight chords → passing air:
 - Makes faster vibration, which equals a
 - Higher frequency, which equals a
 - Higher pitch

Men:

- Thick chords:
 - Chords vibrate at a slower rate, which equals a
 - Lower frequency, which equals a
 - Lower pitch

Elderly:

- Weak/loose chords (have lost elasticity over the years):
 - Chords vibrate in an uneven manner

AIR STREAM CONTROLLED BY:

1. volume (force air comes out of lungs)
2. voicing (vibration or not of the vocal chords)
3. pitch (the rate the chords vibrate...lower frequency, lower pitch)
4. resonance (three chambers: nasal, oral, pharynx)
5. place of articulation (articulator and point articulation)
6. manner of articulation (the way air is obstructed)

Phonetic Symbols to be used in FLL 455/655
CONSONANTS

SYMBOL	ENGLISH	SPANISH	FRENCH	ITALIAN
[p ^h]	pill	---	---	---
[p]	spill	paso	pire	pane
[b]	bill	base	basse	bambino
[β]	---	deba	---	---
[t ^h]	tip	---	---	---
[t]	stop <i>alveolar</i>	toro <i>dental</i>	tas <i>dental</i>	tonno <i>dental</i>
[d]	dull <i>alveolar</i>	donde <i>dental</i>	donne <i>dental</i>	duomo <i>dental</i>
[ð]	these	todo	---	---
[k ^h]	coat	---	---	---
[k]	skip	quitar	quitter	cane
[g]	goat	guitarra	guitare	gondola
[ʎ]	---	lago	mer	---
[f]	fun	fama	fer	fortuna
[v]	vote	---	voter	vino
[θ]	thin	cena <i>Castilian</i>	---	---
[s]	sit	sano	son <i>dental</i>	sono <i>dental</i>
[z]	zoo	mismo*	zéro <i>dental</i>	zebra <i>dental</i>
[ʃ] or [š]	ship	---	cher	scemo
[ʒ] or [ž]	measure	---	jaune	---
[tʃ] or [č]	cheap	chico	---	cena
[dʒ] or [ǰ]	jump	enyesar	---	giocare
[x]	---	ajo	---	---
[j] (yod) (see semi- consonants)	year	ayuda/calle	faille	---
[h]	hello	---	---	---

Phonetic Symbols to be used in FLL 455/655
 CONSONANTS

[m]	man	mano	mer 	macchina
[ŋ] due to assimilation	---	enfermo	---	---
[n]	nothing	cuna	ananas  <i>dental</i>	Niente <i>dental</i>
[ɲ] due to assimilation	---	antes	ananas 	
[ɲ]	---	año	agneau 	gnocchi
[ŋ]	bring	brincar	*jogging (loan words)	Ancora
[l]	leap	lado	lit  <i>dental</i>	luce <i>dental</i>
[t]	tall	---	---	---
[ɹ]	car	---	---	---
[r]	butter	para	---	Roma
[r]	---	carro	---	---
[ʁ]	---	---	baron 	---
[ʁ]	---	---	trame	---

Phonetic Symbols to be used in FLL 455/655
VOWELS

SYMBOL	ENGLISH	SPANISH/ITALIAN	FRENCH
[i]	beat	mira / Tina	lit <i>open</i> 
[I]	bit		---
[u]	boot	cura / mucca	mou 
[ʊ]	book		---
[y]	---	---	connu 
[e]	may	café / caffè	café <i>open</i> 
[ɛ]	bet		bête 
[o]	bow	bota / notte	beau 
[ə]	about	---	petit <i>closed</i> 
[ɔ]	bought	--	botte <i>closed</i> 
[ø]	---	---	feu 
[œ]	---	---	peur <i>closed</i> 
[a]	cot	pato / gatto	patte
[ɑ]	father		pâte 
[ã]	---	---	sang 
[õ]	---	---	bon 
[œ̃]	---	---	brun 
[ɛ̃]	---	---	cinq

To here French Vowels:

<http://www.languageguide.org/francais/grammar/pronunciation/>

Phonetic Symbols to be used in FLL 455/655
VOWELS

[w] glides semi-consonants	wine	bueno / buono	ouate
[j] glides Semi-consonants	---	bien / vieni	bien ayant
[ɥ] glides	---	---	huit tuant
[ɥ̞] glides semi-vowels	--	de usted	--
[i̞] glides semi-vowels	--	veinte	--

Spanish Consonants

Manner		Place							
		Bilabial	Labiodental	Interdental	Dental	Alveolar	Alveolar-Palatal	Palatal	Velar
Stop	voiced	b			d				g
	voiceless	p			t				k
Fricative	voiced	β		ð		z			ʝ
	voiceless		f	θ		s			x
Affricate	voiced						dʒ		
	voiceless						tʃ		
Nasal	voiced	m	ɱ			n		ɲ	ŋ
Lateral	voiced					l			
Flap/Trill	voiced					ɾ r			
Semiconsonant	Voiced							j	w

Tongue Position		
Front	Central	Back
Lip Position		
Unrounded		Rounded
Oral	Oral	Oral
High	i	u
<i>High-low</i>		
Mid-high	e	o
<i>Mid-low</i>		
Low	a	

French Consonants

Manner		Place							
		Bilabial	Labiodental	Dental	Alveolar	Alveolar-Palatal	Palatal	Velar	Uvular
Stop	voiced	b		d				g	
	voiceless	p		t				k	
Fricative	voiced		v	z		ʒ	j	ɣ	
	voiceless		f	s		ʃ			
Affricate	voiced								
	voiceless								
Nasal	voiced	m		n			ɲ	ŋ* (loan words)	
Lateral	voiced			l					
Flap/Trill	voiced								ʀ
	Voiceless								ʀ̥
Semiconsonant	Voiced						j	w	

	Tongue Position					
	Front			Back		
	Lip Position					
	Unrounded/stretched		Rounded		Rounded	
	Oral	Nasal	Oral	Nasal	Oral	Nasal
	j		ɥ		w	
High	i		y		u	
Mid-high	e		ø		o	
Mid-low	ɛ	ẽ	œ	œ̃	ɔ	ɔ̃
Low	a		ə		ɑ	ɑ̃

French vowels:

A vowel will be nasalized when it is followed in the same syllable by a nasal consonant

[ã] sang = a or e followed by a nasal

[õ] bon = o followed by a nasal

[œ̃] brun = u followed by a nasal

[ẽ] bien = e or i followed by a nasal

[i] i, î, y

[ə] -monosyllables (ce, de, je, le, me, ne, que, se, te)
 -letter e followed by a single non-final consonant (demandons; appeler)
 -n, z, s, v are always followed by mute e
 -final letter(s) e; es; ent as an ending: (lave, laves, lavent, chose, choses)
 -some forms of the verb faire
 -on in the word monsieur

[e] ai, é, ée, ei (CV sequence... final phonetic vowel)

[ɛ] ê, è, e, ai, ay, ei
 VC sequence: ie /e/ followed by a final phonetic consonant (open) (près = [prɛ])

[ɑ] â, a+z, a+s(mute), -roi

[ø] œu, eu and ends with an open syllable: veux = [vø]

[œ] œu, cue, gue, eu and ends with a closed syllable: veulent = [vœl]

[u] mou, ou

[y] connu, û

[o] o, ô, eau, au, au (CV sequence)

[ɔ] -um, o fosse = [fɔs]

To hear French vowels: <http://www.languageguide.org/francais/grammar/pronunciation/>

Italian Consonants

Manner		Place						
		Bilabial	Labiodental	Dental	Alveolar	Alveolar-Palatal	Palatal	Velar
Stop	voiced	b		d				g
	voiceless	p		t				k
Fricative	voiced		v	z				
	voiceless		f	s		ʃ		
Affricate	voiced			dz		dʒ		
	voiceless			ts		tʃ		
Nasal	voiced	m		n			ɲ	ŋ
Lateral	voiced			l			ʎ	
Flap/Trill	voiced					r r		
Semiconsonants	Voiced						j	w

Manner of Articulation (consonants only):

the manner in which air is blocked

- **OCCLUSIVE/STOP:** total interruption or blocking of air from the lungs.

	[k]		
skip	English	[b], [p] [t], [d], [k], [g]	
con	Spanish	[b],[p], [t], [d], [k], [g]	
quitter	French	[b], [p],[t], [d],[k], [g]	
coniglio	Italian	[b], [p],[t], [d],[k], [g]	

- **FRICATIVE/ASPIRANT:** sounds that are produced when there is a partial interruption of the air; air continues to flow, but with some friction upon passing the POINT of articulation.

	[s]		<i>ship this</i>		<i>these</i>
sit	English	[f], [h], [s], [ʃ], [θ], [v], [ʒ], [z],			[ð]
sal	Spanish	[f], xx, [s], xx, xx*, xx, xx		[z], [β], [ð̃], [ʎ], [x]	
		<i>fer son cher</i>			<i>mer</i>
son	French	[f], xx, [s], [ʃ], xx, [v], [ʒ], [z],	xx, xx, [ʎ], xx		
sono	Italian	[f], xx, [s], [ʃ], xx, [v], xx, [z], xx,	xx, xx, xx		

- **AFFRICATE:** An OCCLUSIVE followed by a FRICATIVE.

	[tʃ]	
chip	English	[tʃ]
ocho	Spanish	[tʃ]
XX	French	(however, borrowed words, <i>match</i> as in football match)
cena	Italian	[tʃ] [ts], [dz]
		<i>ciao, pizza zio</i>

- **LATERAL:** air passes over both sides of the tongue.(LIQUID)

[l]

leap English [t kill]

Lola Spanish

Lit French (dental)

Luce Italian (dental)

- **VIBRANT and TRILL:** air is perturbed. (LIQUID)

Alveolar FLAP/TAP

[ɾ]

butter English

para Spanish

XX French* (Canadian)

raro Italian

Uvular FLAP

[ʁ] baron French

[ʁ̥] trame French

TRILL

[r]

xx English

perro Spanish

xx French

xx Italian

- **NASAL:** sounds produced with closed mouth, letting the air pass through the nasal cavity.

[n], [ɲ], [ŋ], [ń], [ɳ], [ɱ], [m]

null English [m], [n]

cuna Spanish [m], [n]

ananas French [m], [n]

nonno Italian [m], [n], [n:]

EXCERCISES

What Manner?

	SPANISH	FRENCH	ITALIAN
1. [p]	pan	pire	pane
2. [l]	lejos	lit	lontano
3. [x]	jota	XX	XX
4. [m]	mano	mer	mano
5. [f]	fino	fer	fine
6. [tʃ]	chiste	XX	cena

Answers:

1. [p] occlusive
2. [l] lateral
3. [x] fricative
4. [m] nasal
5. [f] fricative
6. [tʃ] affricate

Place of Articulation (consonants)

this is where in the vocal tract the airflow restriction occurs.

BILABIAL: *articulation occurs when we bring both lips together.*

Articulator (moveable)/Place (unmovable)

English: initial [p^h] [p] [m] [b] **xx**

Spanish: **xx** [p] [m] [b] [β]

French: **xx** [p] [m] [b]

Italian: **xx** [p] [m] [b]

- 1) Which sound in Spanish would it be difficult for Americans to **learn**? Why?
- 2) Which sound would English speakers be **carrying over incorrectly** to Spanish/French/Italian?
- 3) Which sound in English would it be difficult for Spanish/French/Italian speakers to learn? Why?

LABIODENTAL: *articulation occurs when the bottom lip touches the upper teeth.*

English: [f] fine, [v] vine

Spanish: [f] fino, **xx**

French: [f] fer, [v] voter

Italian: [f] fino [v] vino

- 1) Which sound would English speakers be **carrying over** incorrectly to Spanish?

INTERDENTAL: *articulation occurs when the tongue is inserted between the upper and lower teeth.*

English: [ð] **these**, d*(alveolar) [θ] **thing**
 Spanish: [ð] **lado** (voiced) voiceless [θ] **hace** (castellano*)
 French: **xx**
 Italian: **xx**

DENTAL: *articulation occurs when the tongue touches or comes close to touching the **back** of the upper front teeth.*

English: **xx**
 Spanish: [t] todo [d] daño
 French: [t] tas [d] donne [n] no [z] zéro [s] son [l] lit
 Italian: [t] tu [d] donna [n] no [z] snello[s] sale [l] luce [ts] pizza [dz] zio

1) Which sound in Spanish/Italian/French would it be difficult for Americans to **learn**? Why?

ALVEOLAR: *articulation occurs when the tongue touches or comes close to touching the alveolar ridge.*

English: [t] [d] [l] [n] [s] [ʃ] run [r] **butter** **x** [z] zebra
 Spanish: **x** **x** [l] [n] [s] **x** [r] **para** [r] **parrá** [z] zapatos
 French: **xx**
 Italian: **xx**

1) Which sounds would English speakers be **carrying over incorrectly** to Spanish?
 2) Which sound in Spanish would it be difficult for Americans to **learn**? Why?

PALATAL: *articulation occurs when the tongue touches or comes close to touching the palate.*

ship measure cheese judge year

English:	[ʃ]	[ʒ]	[tʃ]	[dʒ]	[j]	xx
Spanish:	xx	xx	*xx	*xx	[j] ayuda	[ɲ] año
French:	*xx	*xx	xx	xx	[j] faille	[ɲ] agneau
Italian:	*xx	xx	*xx	*xx	xx	[ɲ] gnocchi [ʎ] gli

ALVEOLAR-PALATAL:

Spanish		[tʃ] chico	[dʒ] enyesar
French	[ʃ] cher		[ʒ] jaune
Italian	[ʃ] <i>scemo</i>	[tʃ] <i>cena</i>	[dʒ] <i>giocare</i>

Note: French does have the sound [dʒ] but it is a combination of the orthographic letter <d> and <j> (adjoint). The phonetic sounds presented here means that only ONE orthographic letter (i.e. <g> in Italian and <y> in Spanish) is producing the phonetic symbol [dʒ]

This is exclusive of **digraphs**: where two orthographic letters represent one phonetic sound.

Spanish: rr = [r] ch = [tʃ] ll = [j]

French: gn = [ɲ]


Italian: gn = [ɲ] gl = [ʎ]

VELAR: *articulation occurs when the tongue touches or comes close to touching the velum (soft palate).*

	<i>go</i>		<i>cake</i>	<i>bring</i>	
English:	[g]	xx	[k]	[ŋ]	xx
Spanish:	[g]	[ɣ]	[k]	[ŋ]	angosto [x] ajo
French:	[g]	[ɣ]	[k]	xx	
Italian:	[g]	xx	[k]	[ŋ]	ancora

1) Which sound in Spanish/French would it be difficult for Americans to **learn**? Why?

UVULARS: *articulation occurs when the back of the tongue touches the uvula.*

English:	xx
Spanish:	xx
French:	[ʁ] baron  [ʁ] trame
Italian:	xx

1) Which sound in French would it be difficult for Americans to **learn**? Why?

GLOTTAL: *articulation happens when there is no airflow restriction. Its sound is from the flow of air through the open glottis. The tongue and lips are usually in the position for the production of the following vowel.*

English:	[h] hello
Spanish:	xx
French:	xx
Italian:	xx

1) Which sound in Spanish would it be difficult for Americans to **unlearn**? Why?

VOICING

Voiced Sounds: *when the vocal cords are together, the airstream forces its way through and causes them to vibrate.* **[d] [b]**
[g] [z]

Voiceless Sounds: *when the vocal cords are apart during airflow, the air flows freely through the glottis producing a voiceless sound.*

[t] [p] [k] [s]

rope/robe fate/fade rack/rag

fine/vine seal/zeal choke/joke

peat/beat tote/dote kale/gale

The voiced/voiceless distinction is very important. It distinguishes words in word pairs.

EXCERCISES				
Choose One:	French	Spanish	Italian	
	POINT	Manner	Voiced?	example
[b]	bilabial	stop	voiced	votar - botte
[m]				
[r]				
[k]				
[θ]				
[j]				
[ð]				
[p]				
[ɲ]				
[tʃ]				
[g]				
[ʃ]				
[x]				
[f]				
[β]				
[ʒ]				

p. 270 #6 (all)

p. 271 #9 (a, d, e, f), #11 (b, c, e)

El alfabeto fonético - SPANISH

Phoneme (written)	Allophone(s)	Examples
/b/	b, v	[b] (sentence initial & after nasal) va [bá] enviar [em.bjár] [β] (elsewhere) cabo [ká. βo], tuvo [tú. βo]
/s/	ce, ci, s, z	[s] cine, cena, sopa, zapatos [sí.ne] [sé.na] [só.pa] [sa.pá.tos]
/θ/	ci, ce, z	[θ] (castellano) cine, cena, zapatos [θí.ne] [θé.na] [θa.pá.tos]
/tʃ/	ch	[tʃ] chico [tʃí.ko]
/d/	d	[d] (sentence initial, after nasal, after l) domino [do.mí.no], aldea [al.dé.a] [ð] (elsewhere) lado [lá. ðo]
/e/	e	[e]
/f/	f	[f]
/g/	g, gu	[g] (sentence initial & after nasal) gato [gá.to], guernica [ger.ní.ka] [ɣ] (everywhere else) lago [lá.ɣo], alguno [al.ɣú.no]
	h	hola [ó.la]

/i/	i & y	[j] [i̯] diphthongs	bien [bjén], yo [jó] Jaime [xáj.me]
/j/	ll, hi+v	[j]	calle [ká.je] hielo [jé.lo]
/x/	j, x, ge, gi	[x]	jardín [xar.ðín]
/k/	ca, co, cu, k, qu	[k]	quiosco, cabe, cuchillo [kjós.ko] [ká.βe] [ku.tʃí.jo]
/l/	l	[l]	
/m/	m	[m]	
/n/	n	[n] (via assimilation [ŋ], [ɲ], [ñ], [m], [ɱ], [ɲ])	
/ɲ/	ñ	[ɲ]	
/o/	o	[o]	
/p/	p	[p]	
/k/	qu	[k]	quiero [kjé.ro]
/r/	r	[r]	aroma, pero
/r/	rr, r inicial	[r]	perro [pé.ro], Roma [ró.ma]
/s/	s, z, ce, ci	[s]	sopa, zapatos, cine, cena
/t/	t	[t]	

/u/	u	[u], [w], [u̠]	diphthongs	bueno [bwé.no]	aunque [áun̠.ke]
/w/	hu+v	[w]		hueso [wé.so]	
	gü			bilingüe [bi.lín̠.gwe]	
	x	[ks]		exacto [ek.sák.to]	taxi [ták.si]
	(non-indigenous)				

L'alphabet phonétique - French

Phoneme (written)	Allophone(s)	Examples
/b/	b [b]	bébé
/s/	ce, ci, sci, s, ç, x ti+v (except -tière, -tième)	[s] salle [sal], science [sjãs] Français [frã.sɛ], six [sis] essential [ɛ sã sjɛl]
/ʃ/	ch, sch, sh [ʃ]	
/d/	d [d]	
/f/	f, ff, ph [f]	
/g/	g, gg + a, o, u [g] gu+ e, i [g] gu+ a, o [gw]	u is eliminated iguane
/ʒ/	j, gi, gy, ge [ʒ]	je, jambe, Gigi, Égypte, âge
/j/	ille (preceded by a vowel) i/y+ vowel- diphthong, first position	[j] faille [faj] social [so.sjal]

/k/	c o cc +a,o,u k, ck qu, cqu (many exceptions: aquarium [kw], aquarelle,etc.)	[k]	scandale [skã.dal] kilo, Patrick quand, qui, que
	cc + i, e initial x	[ks]	Occident xénophobe
/l/	l, ll	[l] Not pronounced	lent, appelle, famille -after <i>au</i> Gaultier [go tje] -in words like fils [fis], pouls [pu] -word final <i>il</i> - ail [aj] - <i>ill</i> preceded by a consonant <i>veille</i> [vej] (exceptions) - except mille [mil], ville [vil], tranquille
/m/	m, mm	[m]	matte, somme
/n/	n, nn	[n]	panne
/ŋ/	-ing	[ŋ]	parking, jogging
/ɲ/	gn Exception: ignition, agnostique, gnomo, stagnant, diagnostic [ig ni sjõ] etc.	[ɲ]	champagne, enseignement
/o/	o	[o]	
/p/	p	[p]	
/ʁ/	final r	[ʁ]	mer
/ʁ/	r, rr, rh	[ʁ]	terre, rhume

/ʁ/	cluster	[ʁ]	trame
/t/	t, th	[t]	ton, thon
/tʃ/	u+vowel (glide)	[tʃ]	tuant [tʃɑ̃]
/v/	v	[v]	
/w/	ou+vowel	[w]	ouest [west]
	x	[gs] [ks]	-between vowels exister [ɛg zi ste] -followed by consonant extra [ɛk stra] -initial letter xylophone [ksi lɔ fɔn] -word final index [ɛ̃ dɛks]
/z/	s (V_V), z Trans- (VsV)exceptions: after prefix	[z]	visite [vi.zit], zèbre [zɛ.br] transaplin [trɑ̃.zal.pɛ̃] antisocial [ɑ̃.ti.sɔ.sjal]

OTHER FRENCH QUIRKS

- 1) h is mute in French thon [tõ] rhum [rõm]

- 2) word final **consonants** are mute in French pas [pa] chaud [ʃo] est [ɛ]
 - a) Except **c, r, f, l** (exceptions *estomac, tabac, porc, clerc, clef, nerf, fusil, gentil, outil, sourcil, saoul, cul, coutil, nombril, persil* all are mute)
 - b) except word final **-ct** and **-pt**. *tact, contact, concept*
 - c) except foreign borrowed words *tennis* [te nis] *vasistas* [va zi stas] *oasis* [ɔ a zis]
 - d) except words stemming from latin **-um, -us, -en** *album* [al bõm] *amen* [a men]
 - e) All the following final consonants are not mute *bis, mars, ours, fils, hélas, maïs, sens, cassis, gratis, jadis, biceps, forceps, as, autobus, Agnès, palmarès, albatross, rhinoceros, index, un os, gaz, net, chut, zut, dot, brut, est (East), oust, sud (not nord), bifteck, cap, coq*.
 - f) The final consonants in the following words : *août, le but, le fait, les mœurs, exact* can either be mute or pronounced.
 - g) *donc* c is eliminated when *donc* is followed by a word that starts with a consonant
 - h) *tous* the s is pronounced when you use it as a pronoun. The s is mute when it is used as an adjective.
 - i) *plus* as a negation, a comparative or superlative of an adjective, adverb or noun, s is mute. S is pronounced when *plus* is a superlative or comparative found at the end of a sentence. S is mute or pronounced when *plus* is a comparative or superlative of a verb

- 3) word final **r** in infinitive verbs are mute *danser* [dã se]

- 4) word final **c** preceded by **n** is mute *blanc* [blã]

To hear French consonants:

<http://www.languageguide.org/francais/grammar/pronunciation/consonants.html>

French vowels:

A vowel will be nasalized when it is followed in the same syllable by a nasal consonant

- [ã] sang = a or e followed by a nasal
- [õ] bon = o followed by a nasal
- [œ̃] brun = u followed by a nasal
- [ɛ̃] bien = e or i followed by a nasal

- [i] i, î, y
- [ə] -monosyllables (ce, de, je, le, me, ne, que, se, te)
-letter *e* followed by a single non-final consonant (demandons; appeler)
-n, z, s, v are always followed by mute e
-final letter(s) *e*; *es*; *ent* as an ending: (lave, laves, lavent, chose, choses)
-some forms of the verb *faire*
-*on* in the word *monsieur*
- [e] ai, é, ée, ei (CV sequence... final phonetic vowel)
- [ɛ] ê, è, e, ai, ay, ei
VC sequence: ie /e/ followed by a final phonetic consonant (open) (près = [prɛ])
- [ɑ] â, a+z, a+s(mute), -roi
- [ø] œu, eu and ends with an open syllable: veux = [vø]
- [œ] œu, cue, gue, eu and ends with a closed syllable: veulent = [vœl]
- [u] mou, ou
- [y] connu, û
- [o] o, ô, eau, au, au (CV sequence)
- [ɔ] -um, o fosse = [fɔs]

To hear French vowels: <http://www.languageguide.org/francais/grammar/pronunciation/>

For more explanation & practice: Check out
Savoir Dire: Cours de phonétique et de prononciation ([PC2135 .D34 1990](#))