



ELL101: Intro to Linguistics

Week 1 Phonetics & IPA

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Fields of linguistics

- Week 1-2: Phonetics (physical sound properties)
- Week 2-3: Phonology (speech sound rules)
- Week 4: Morphology (word parts)
- Week 5-6: Syntax (structure)
- Week 7-8: Semantics (meaning)
- Week 7-8: Pragmatics (conversation & convention)
- Week 9: First & Second language acquisition
- Week 10-12: Historical linguistics (history of language)
- Week 10-12: Socio-linguistics (language in society)
- Week 10-12: Neuro-linguistics (the brain and language)
- Week 10-12: Computational linguistics (computer and language)
- Week 10-12: Evolutional linguistics (how language evolved in human history)

Phonetics

Phonetics is a study of the characteristics of the speech sound (p.30; Yule (2010))

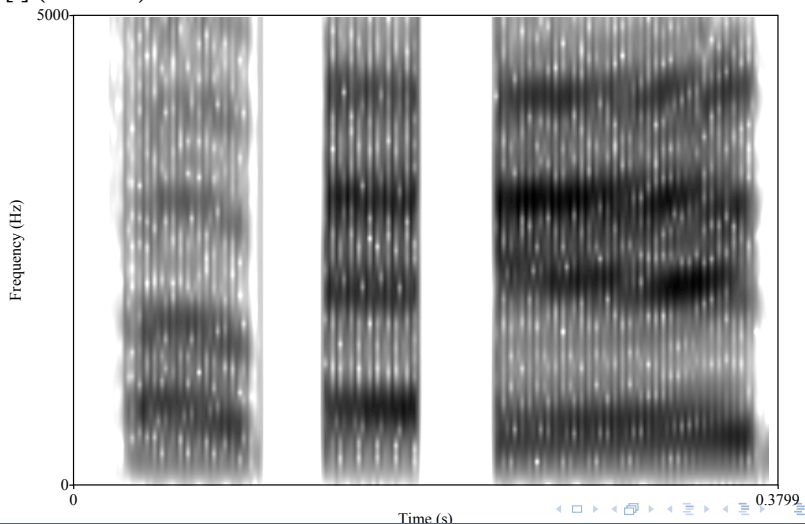
Branches of phonetics

- **Articulatory phonetics**
 - how speech sounds are made
- **Acoustic phonetics**
 - physical properties of speech sounds
- **Auditory phonetics**
 - how speech sounds are perceived

- See some examples of phonetics research:
 - Speech visualization (acoustic / auditory phonetics)
 - "McGurk effect" (auditory phonetics)

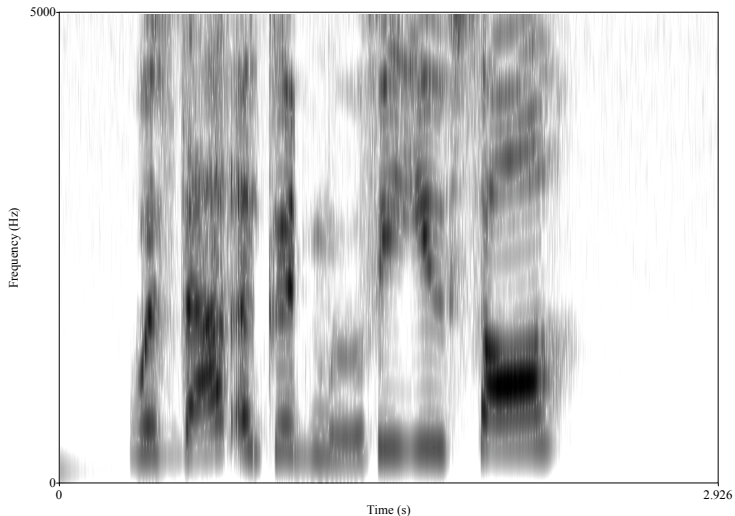
Acoustic phonetics (example)

- The speech wave (spectrogram) of "[a] (as in *above*), [ɛ] (as in *bed*), and [ɪ] (as in *bit*)"



Acoustic phonetics (example)

- The speech wave (spectrogram) of "Was that a good movie you saw?"



Auditory phonetics (example)

- McGurk effects

<http://faculty.lagcc.cuny.edu/tnagano/ELL101Resources/>

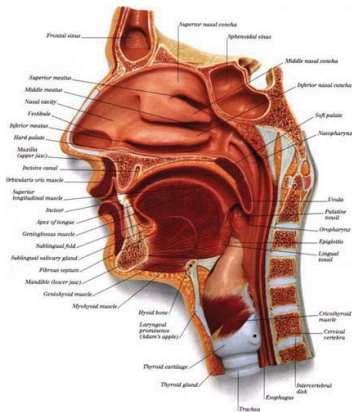


Vocal tract

- the lungs
- trachea (windpipe)
- larynx (or in a more familiar term, "Adam's apple")
- the vocal cords (vocal folds)
 - two flaps that open or close off the glottis
 - when stretched over, the vocal folds produce buzz sounds ("voicing")
- pharynx (in a familiar term, "the throat")
- the oral cavity ("the mouth region")
 - lips, teeth, alveolar ridge, (hard) palate, velum (soft palate), uvula, the tongue
- the nasal cavity ("the nose region")

The vocal tract II

- We need to look our head cut in half along the front-back dimension.
(from *the Ultimate Visual Dictionary*, p.245)



The vocal tract III

- Gross!! We need to simplify it to what we really need to know. (from *Language Files*; also see p.31)

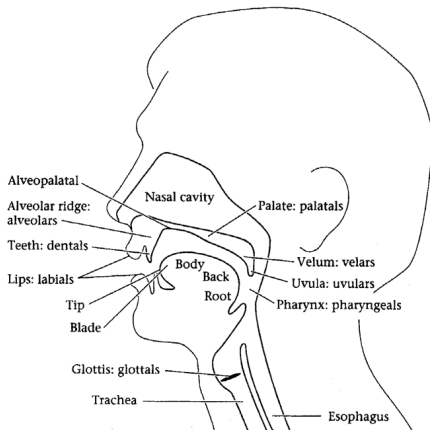
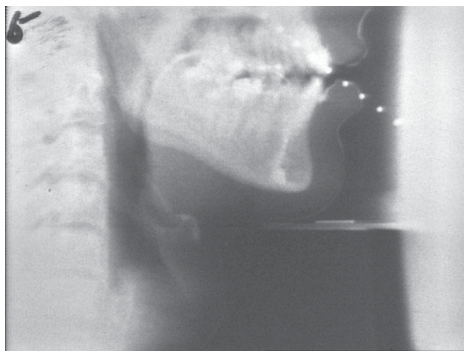


Figure 2.3 The vocal tract

The vocal tract IV

- See how we use the vocal tract to generate speech sound
<http://faculty.lagcc.cuny.edu/tnagano/ELL101Resources/>



International Phonetic Alphabet (IPA) I

- English orthography is a nightmare
- How do you pronounce the following words?
 - psychic, pneumatic, receipt, psychology
 - comb, dumb, tomb, womb
 - doubt, subtle, debt
 - could, should, half, salmon
 - honor, honorable, honest, heir
 - knee, knife, know, knowledge
 - castle, whistle, soften

International Phonetic Alphabet (IPA) II

- How do you pronounce word "SEAGH"?
 - "sure" - how is "s" pronounced?
 - "dead" - how is "ea" pronounced?
 - "laugh" - how is "gh" pronounced?
 - Therefore, SEAGH can be pronounced as "chef"??
- how do you pronounce 'ghoti'?

Problem of the English orthography

There is no rigid one-to-one correspondence between English spelling and pronunciation.

International Phonetic Alphabet (IPA) III

IPA (International Phonetic Alphabet)

A set of symbols that maintain the strict match with pronunciation (that is, there is only one way to pronounce it)

- English spelling 'a' can be pronounced at least in three different ways:
 - [i] as in ('beat')
 - [eɪ] (as in 'bayed')
 - [æ] (as in 'bad')
- Those three a's are transcribed differently in IPA
- The phonetic transcriptions are usually in the square brackets or two slashes (e.g., [a] or /a/)

Three articulation features of consonants

- The articulation of consonants can be characterized by three major factors:
 - voicing (either "voiced" or "voiceless")
 - the place of articulation
 - the manner of articulation

Three articulation features of vowels

- The articulation of vowels can be characterized by three major factors:
 - height ("high" - "mid" - "low")
 - backness ("front" - "central" - "back")
 - tenseness ("tense" or "lax")

IPA: consonants place of articulation I

- Seven different places of articulation (this classification is simplified for English; The complete IPA lists 11 different places of articulation)

Seven places of articulation for the English consonant

- bilabial
- labiodental
- dental (sometimes called "interdental")
- alveolar
- palatal (sometimes called "alveo-palatal")
- velar
- glottal

IPA: consonants place of articulation II

Bilabial sounds

- with two (bi) lips (labial)

IPA ENGLISH EXAMPLES

[p] pit, top, spit, hiccough, appear

[b] ball, globe, amble, brick, bubble

[m] moose, lamb, smack, amnesty, ample

[w] with, where, mowing, queen, twillight

- Examples are from *Language Files*

IPA: consonants place of articulation III

Labiodental sounds

- with the lower lip (labio) and the upper teeth (dental)

IPA ENGLISH EXAMPLES

[f] foot, laugh, philosophy, coffee, carafe

[v] vest, dove, gravel, anvil, average

- Examples are from *Language Files*

Dental sounds

- with the tongue between the teeth (dental)
- sometimes called "interdental"

IPA ENGLISH EXAMPLES

[θ] through, wrath, thistle, ether, teeth

[ð] the, their, mother, either, teethe

- The symbol θ is pronounced as "theta" and ð is pronounced as "eth"
- Examples are from *Language Files*

Alveolar sounds

- with the tongue tip at the alveolar ridge

IPA ENGLISH EXAMPLES

[t] tag, pat, stick, pterodactyl, stuffed

[d] dip, card, drop, loved, batted

[s] soap, psychology, packs, descent, peace

[z] zip, roads, kisses, Xerox, design

[n] nap, design, snow, know, mnemonic

[l] leaf, feel, Lloyd, mild, applaud

[r] reef, fear, Harris, prune, carp

- [r] is sometimes transcribed as [ɹ] or [ʀ]; Examples are from *Language Files*

Palatal sounds

- with the tongue tip at the palatal region
- sometimes called "alveo-palatal"

IPA ENGLISH EXAMPLES

[ʃ] shy, mission, nation, glacial, sure

[ʒ] measure, vision, azure, casuality, decision

[tʃ] choke, match, feature, constituent

[dʒ] judge, George, Jello-O, region, residual

[j] you, beautiful, feud, use, yell

- The symbol ʃ is pronounced *esh*, ʒ is *yogh*, tʃ is *t-esh ligature*, and dʒ is *d-yogh ligature*
- In some textbooks, the Americanized IPA (those in the parentheses) are used
- Examples are from *Language Files*

IPA: consonants place of articulation VII

Velar sounds

- with the back of the tongue at the velum

IPA ENGLISH EXAMPLES

[k] kit, scook, character, critique, exeed

[g] guard, bag, longer, designate, Pittsburgh

[ŋ] lung, think, finger, singer, ankle

- The symbol ŋ is pronounced *angma*
- Examples are from *Language Files*

IPA: consonants place of articulation VIII

Glottal sounds

- at the larynx (without any active use of the tongue)

IPA ENGLISH EXAMPLES

[ʔ] uh-oh, hatrick, Batman

[h] who, hat, rehash, hole, whole

- Examples are from *Language Files*

Six manners of articulation for the English consonant

- Stop (also known as "plosive")
- Fricative
- Affricate (stop + fricative)
- Nasal
- Liquid
- Glide

IPA: consonants manner of articulation II

Stop (plosive) sounds

- complete closure of the air stream

IPA ENGLISH EXAMPLES

[p] pit, top, spit, hiccough, appear

[b] ball, globe, amble, brick, bubble

[t] tag, pat, stick, pterodactyl, stuffed

[d] dip, card, drop, loved, batted

[k] kit, scook, character, critique, exeed

[g] guard, bag, longer, designate, Pittsburgh

[ʔ] uh-oh, hatrick, Batman

- Examples are from *Language Files*

Fricative sounds

- narrow opening through which the air is forced through

IPA ENGLISH EXAMPLES

[f]	<u>f</u> oot, lau <u>gh</u> , <u>ph</u> ilosoph <u>y</u> , coff <u>e</u> e, caraf <u>e</u>
[v]	<u>v</u> est, do <u>v</u> e, grav <u>e</u> l, anv <u>i</u> l, aver <u>a</u> ge
[θ]	<u>th</u> rough, wr <u>ath</u> , <u>th</u> istle, eth <u>e</u> r, te <u>eth</u>
[ð]	<u>th</u> e, <u>th</u> eir, moth <u>e</u> r, eith <u>e</u> r, te <u>eth</u>
[s]	<u>s</u> oap, ps <u>ych</u> ology, pack <u>s</u> , desc <u>e</u> nt, peac <u>e</u>
[z]	<u>z</u> ip, road <u>s</u> , kiss <u>e</u> s, <u>X</u> erox, des <u>ign</u>
[ʃ]	<u>sh</u> y, miss <u>ion</u> , nati <u>on</u> , glaci <u>al</u> , <u>s</u> ure
[ʒ]	meas <u>ure</u> , visi <u>on</u> , az <u>ure</u> , cas <u>ual</u> ity, decis <u>ion</u>
[h]	<u>wh</u> o, <u>h</u> at, reh <u>ash</u> , <u>h</u> ole, <u>wh</u> ole

- Examples are from *Language Files*

IPA: consonants manner of articulation IV

Affricate sounds

- sequence of the stop and the fricative gestures

IPA ENGLISH EXAMPLES

[tʃ] choke, mach, feature, constituent

[dʒ] judge, George, Jello-O, region, residual

- Examples are from *Language Files*

Nasal sounds

- the air through the nasal cavity

IPA ENGLISH EXAMPLES

[m] moose, lamb, smack, amnesty, ample

[n] nap, design, snow, know, mnemonic

[ŋ] lung, think, finger, singer, ankle

- Examples are from *Language Files*

Liquid sounds

- lateral liquid [l] and retroflex liquid [ɭ]

IPA ENGLISH EXAMPLES

[l] leaf, feel, Lloyd, mild, applaud

[ɭ] reef, fear, Harris, prune, carp

Glide sounds

- also called *semi-vowel* and *approximant*

IPA ENGLISH EXAMPLES

[w] with, where, mowing, queen, twillight

[j] you, beautiful, feud, use, yell

- Examples are from *Language Files*

Voicing for the English consonant

When the laryngeal (the vocal cords) is spread out, it creates a buzz sound (touch your Adam's apple to feel the vibration). Consonants with the vibration of the vocal cords are called *voiced*. Those without the vibration are called *voiceless*

- Obstruent sounds (stops, affricates, fricatives) have "voiced" and "voiceless" pairs
 - voiced - usually on the right of the cell
 - voiceless - usually on the left of the cell
- Sonorant sounds (nasals, liquids, glides) have only "voiced" sounds

IPA: consonants at a glance

		Place of Articulation													
		Bilabial		Labiodental		Interdental		Alveolar		Palatal		Velar		Glottal	
Manner of Articulation	Stop	p	b					t	d			k	g	ʔ	
	Fricative			f	v	θ	ð	s	z	ʃ	ʒ			h	
	Affricate									tʃ	dʒ				
	Nasal		m						n				ŋ		
	Lateral Liquid								l						
	Retroflex Liquid								r						
	Glide	ʍ	ʋ										j		

State of the Glottis:

Voiceless

Voiced

IPA: vowels at a glance

- List of English vowels
 - 12 vowels and 3 diphthongs (a lot of dialectal and individual variations)

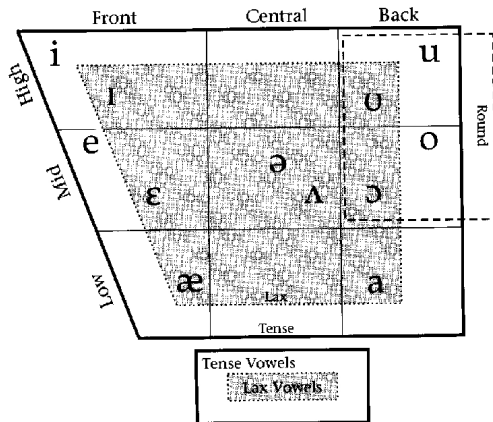


Figure 1. The vowels of English.

Front vowels

The tongue is located at the front of the oral cavity

IPA ENGLISH EXAMPLES

[i] beat, we, believe, people, money

[ɪ] bit, consist, injury, malignant, business

[e] bait, reign, great, they, gauge

[ɛ] bet, reception, says, guest, bury

[æ] bat, laugh, anger, comrade, rally

- Examples are from *Language Files*

Central vowels and back vowels

The tongue is located at the center or back of the oral cavity

IPA ENGLISH EXAMPLES

[u] boot, who, sewer, duty, through

[ʊ] put, foot, butcher, could, boogie-woogie

[o] boat, beau, grow, though, over

[ɔ] bought, caught, wrong, stalk, core

[ɑ] pot, father, sergent, honor, hospital

[ʌ] but, tough, another, oven

[ə] among, sofa, Asia

- The symbol ə is pronounced *schwa*
- Examples are from *Language Files*

Diphthong

Combination of two vowels in a sequence

IPA

[ay] or [aɪ]

[aw] or [aʊ]

[oy] or [oɪ]

ENGLISH EXAMPLES

bite, Stein, aisle, choir, island

bout, brown, doubt, flower, loud

boy, doily, reijoice, perestroika, annoy

- Examples are from *Language Files*
- [ov] is sometimes included in the diphthongs, but we will use simple [o] in this class
- [ei] is sometimes included in the diphthongs, but we will use simple [e] in this class

IPA: vowels IV

- Mismatch of English vowel spellings and pronunciations (and individual differences)

SPELL	PRONUNCIATIONS (IPA)			
a	<u>a</u> bout /ə/	w <u>a</u> nder /ɑ/	l <u>a</u> st /æ /	l <u>a</u> te /eɪ/
i	al <u>i</u> ve /aɪ/	g <u>i</u> ve /ɪ/		
u	pu <u>u</u> t /ʊ/	cu <u>u</u> t /ə/	cu <u>u</u> pid /ju/	
ie	fi <u>ie</u> ld /i/	fr <u>ie</u> nd /ɛ/	sci <u>ie</u> nce /aɪ/	
ei	rei <u>ei</u> n /e/	recei <u>ei</u> ve /i/	rei <u>ei</u> nforce /i/	
e	me <u>e</u> t /ɛ/	me <u>e</u> ter /i/		
o	h <u>o</u> t /ɑ/	g <u>o</u> /oʊ/		
ea	he <u>ea</u> d /ɛ/	te <u>ea</u> m /i/	re <u>ea</u> ct /iæ/	
ou	o <u>ou</u> t /aʊ/	so <u>ou</u> p /u/	w <u>ou</u> ld /ʊ/	
oo	co <u>oo</u> l /u/	co <u>oo</u> k /ʊ/	co <u>oo</u> perate /oʊ/	

How to describe speech sounds I

- Consonant
 - "Voicing" - "Place" - "Manner"
 - [p] = voiceless bilabial stop
 - [v] = voiced labiodental fricative
 - [m] = (voiced) bilabial nasal
- Vowels (conventionally)
 - "height" - "backness" (+ "roundness")
 - [i] = high-front (unrounded) vowel
 - [e] = mid-front (unrounded) vowel

How to describe speech sounds II

- Give the phonetic description of the following sounds.
 - [p]
 - [ŋ]
 - [f]
 - [l]
 - [a]
 - [v]
 - [ə]

How to describe speech sounds III

- Give the conventional spelling for the following phonetically transcribed words.
 - [ritʃ]
 - [ritʃ]
 - [rɪdʒ]
 - [rot]
- Transcribe the following words.
 - lose
 - loose
 - cough
 - ghoul

How to describe speech sounds IV

- Give the conventional spelling for the following phonetically transcribed words.
 - [ritʃ] - reach
 - [ritʃ] - rich
 - [rɪdʒ] - ridge
 - [rot] - rote/wrote
- Transcribe the following words.
 - lose - [luz]
 - loose - [lus]
 - cough - [kɔf]
 - ghoul - [gul]

Bibliography I

Yule, G. (2010). *The Study of Language*. Cambridge University Press, New York, NY, 4th edition. ISBN: 9780521749220; Course: ELL101 (textbook); Price: \$29.99.

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