

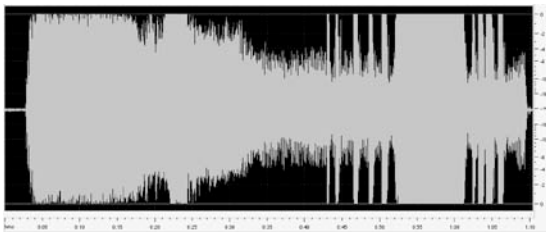
Psych 56L/ Ling 51:
Acquisition of Language

Lecture 6
Phonological Development I

Announcements

Homework 1 due Monday 10/20/08 in class

Sounds of Language



Forget Spelling!

Sounds \neq Spelling

One Sound - Many Characters

h <u>e</u>	e	se <u>as</u>	ea
beli <u>ev</u> e	ie	amo <u>eb</u> a	oe
Ca <u>es</u> ar	ae	ke <u>y</u>	ey
se <u>e</u>	ee	mach <u>in</u> e	i
pe <u>o</u> ple	eo	se <u>i</u> ze	ei

International Phonetic Alphabet: [i]

One Sound - Many Characters

<u>to</u> o	oo	th <u>rew</u>	ew
<u>t</u> o	o	li <u>eu</u>	ieu
cl <u>ue</u>	ue	sh <u>oe</u>	oe
throu <u>gh</u>	ough		

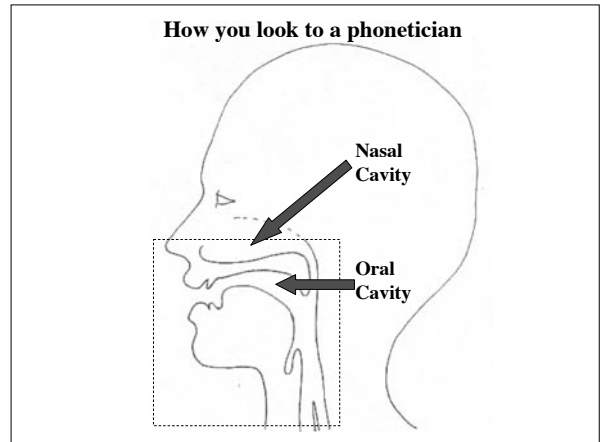
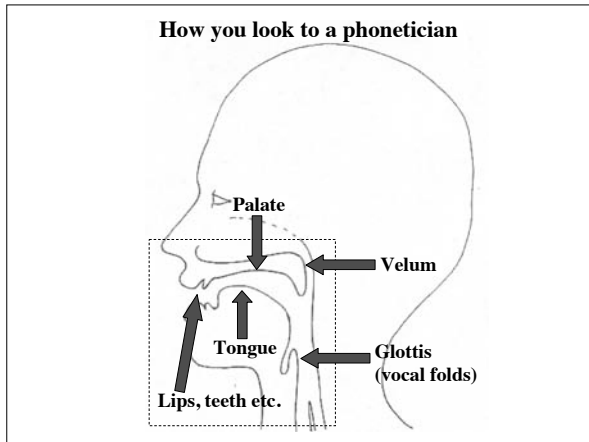
IPA: [u]

One Character - Many Sounds

d <u>a</u> me	e
d <u>a</u> d	æ
f <u>a</u> ther	a
ca <u>l</u> l	ɔ
vi <u>ll</u> age	l, ə
ma <u>n</u> y	ɛ

One Sound - Multiple Letters

<u>sh</u> oot	ʃ
ei <u>th</u> er	ð
<u>ch</u> aracter	k
de <u>a</u> l	i
<u>Th</u> omas	t
<u>ph</u> ysics	f
rou <u>gh</u>	f



Major division: consonants vs vowels

Consonantal sounds: narrow or complete closure somewhere in the vocal tract.

Vowels: very little obstruction in the vocal tract. Can form the basis of syllables (also possible for some consonants).

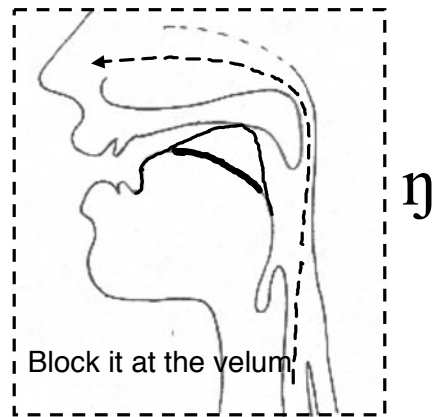
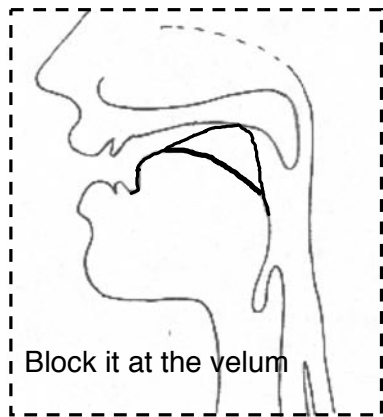
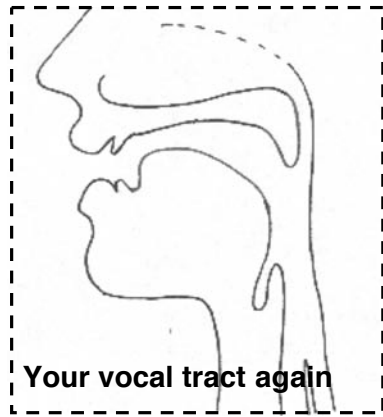
Describing Speech Sounds

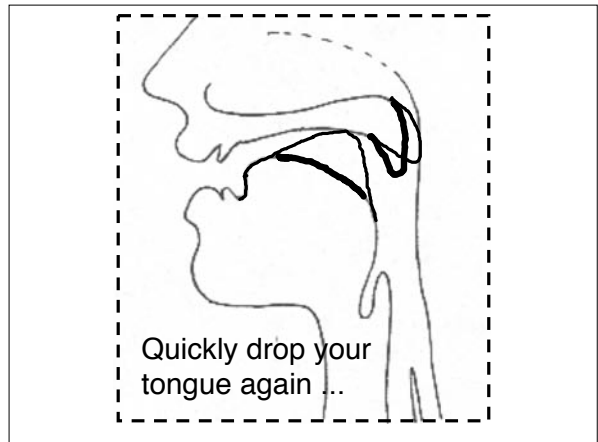
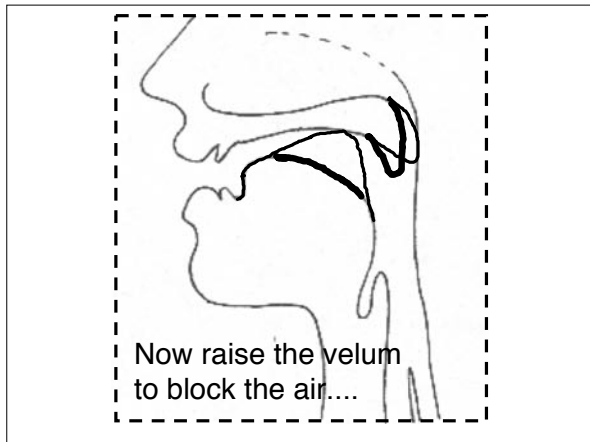
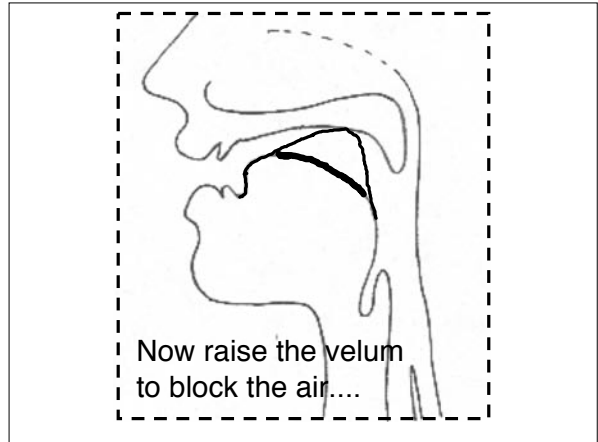
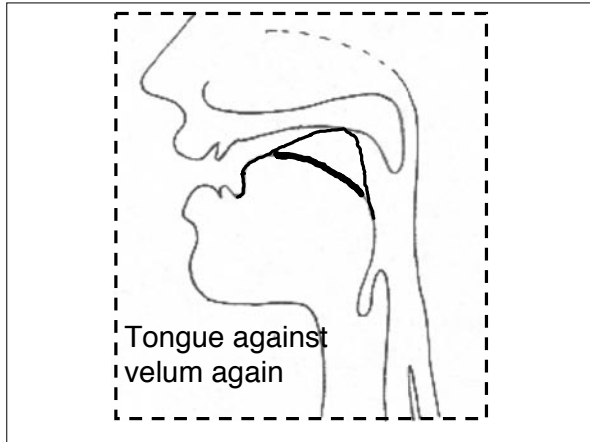
Where/how is the air flowing?
nasal/oral, stop, fricative, liquid etc.

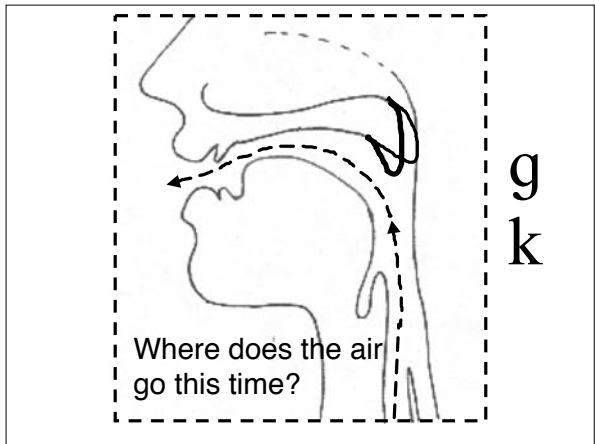
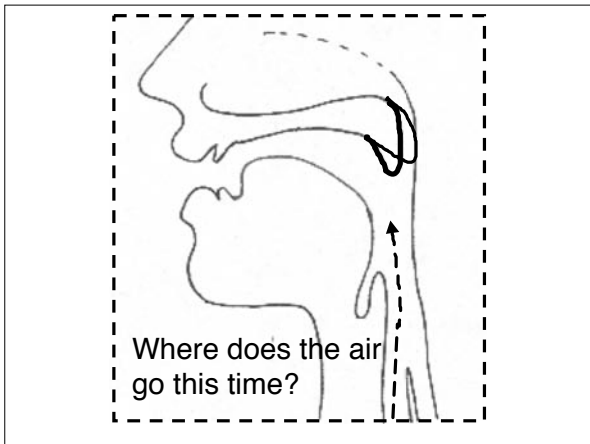
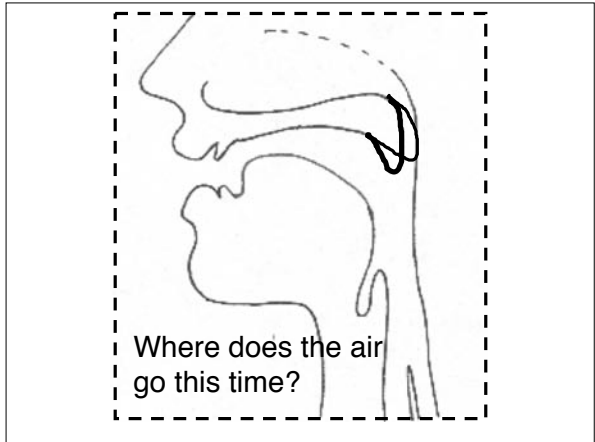
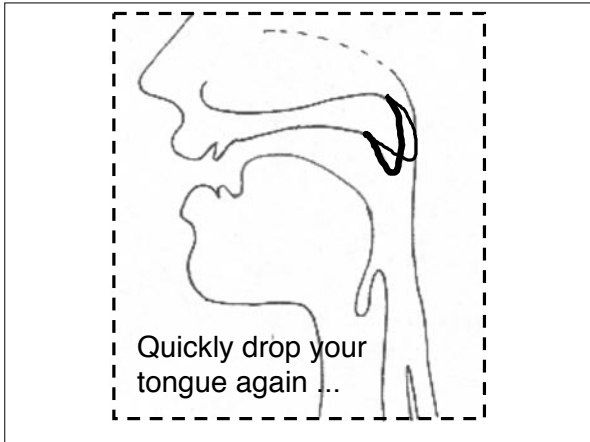
Where is the air-flow blocked?
labial, alveolar, palatal, velar etc.

What are the vocal folds doing?
voiced vs. voiceless

Where does the air flow?







So far we have:

Nasal stop:

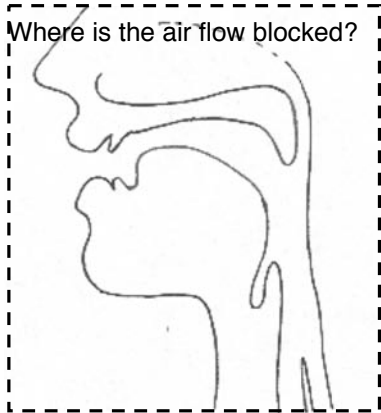
[ŋ]

Non-nasal (oral) stops:

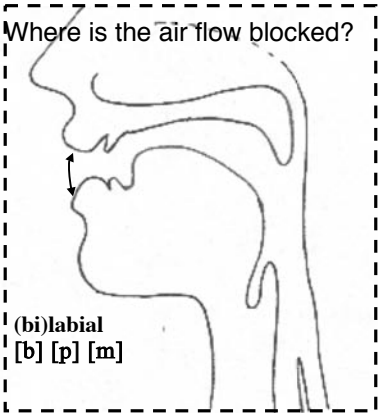
[g] [k]

Where is the air flow blocked?

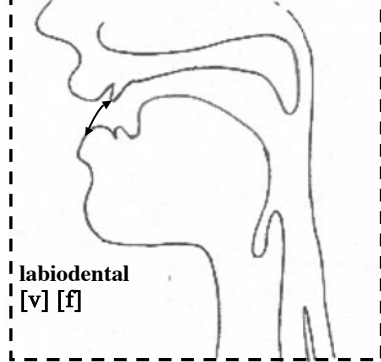
Where is the air flow blocked?



Where is the air flow blocked?

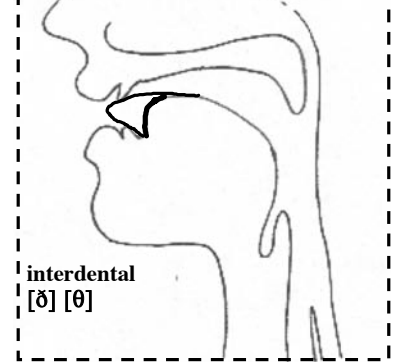


Where is the air flow blocked?



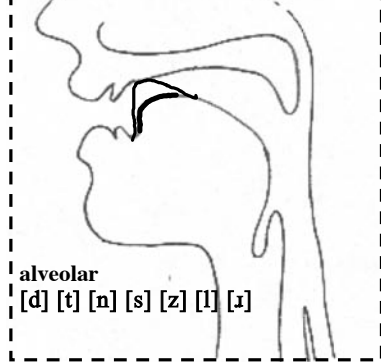
labiodental
[v] [f]

Where is the air flow blocked?



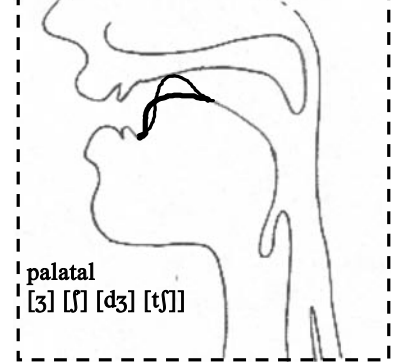
interdental
[ð] [θ]

Where is the air flow blocked?

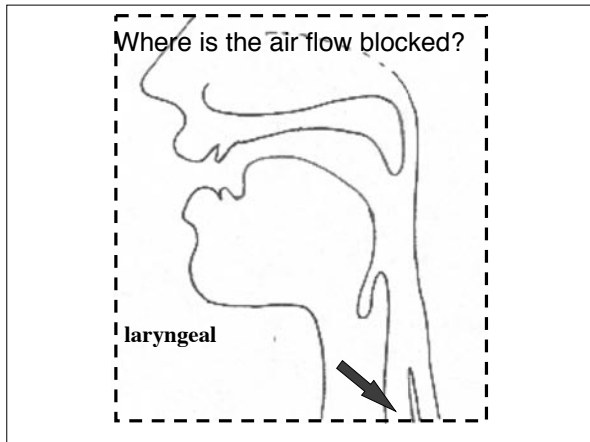
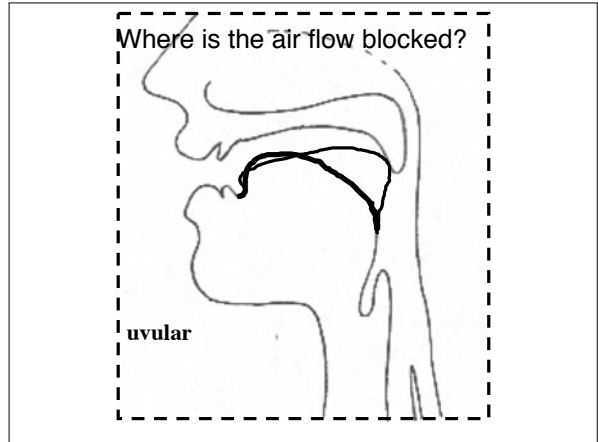
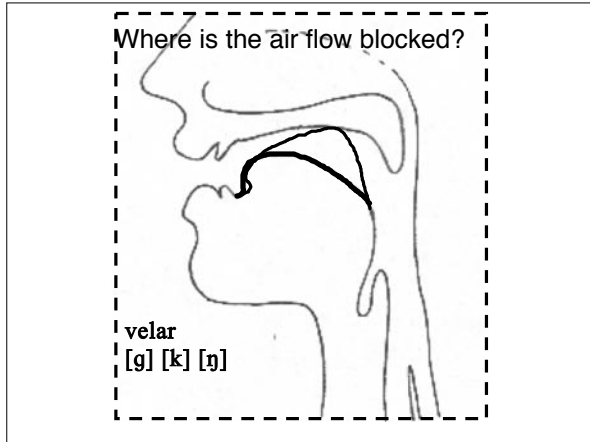


alveolar
[d] [t] [n] [s] [z] [l] [r]

Where is the air flow blocked?



palatal
[ç] [j] [dʒ] [tʃ]



Manner - How the Air is Flowing

Stops
[p] [t] [k] [b] [d] [g] [m] [n] [ŋ]

Fricatives
[f] [v] [θ] [ð] [s] [z] [ʃ] [ʒ]

Approximants/Glides
[w] [j]

Liquids
[l] [ɹ]

Fricatives & Affricates

Palatal sounds [ç] [ʃ] [dʒ] [tʃ]

Palatal Fricatives - [ç] [ʃ]

[note: according to IPA chart these are strictly 'post-alveolar']

Affricates - combination of stop + fricative - [dʒ] [tʃ], as in *judge, church*

What are the vocal folds doing?

Voiced & Voiceless Consonants

Consonants either voiced or voiceless.

English pairs:

b	p	v	f	d	t		
z	s	ð	θ	ʃ	ʒ	tʃ	dʒ

Describing Sounds

	ll-llllll	lllll-llllll	llllll-llllll	ll-llllll	llllllll	llllll	llllllll
llllll llllll	■			■		■	■
llllll llllll	■			■	■	■	
llllllllll	■	■		■		■	■
llllllllll				■	■	■	
llllllll				■	■	■	
llllllll				■		■	

“año”

?

?

	ll-llllll	lllll-llllll	llllll-llllll	ll-llllll	llllllll	llllll	llllllll
llllll llllll	■			■		■	■
llllll llllll	■			■	■	■	
llllllllll	■	■	■	■	■	■	■
llllllllll				■	■	■	
llllllll				■	■	■	
llllllll				■		■	

“Bach”

“agua”

?

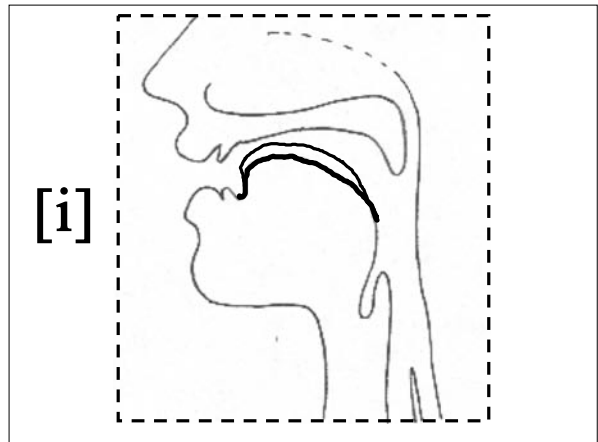
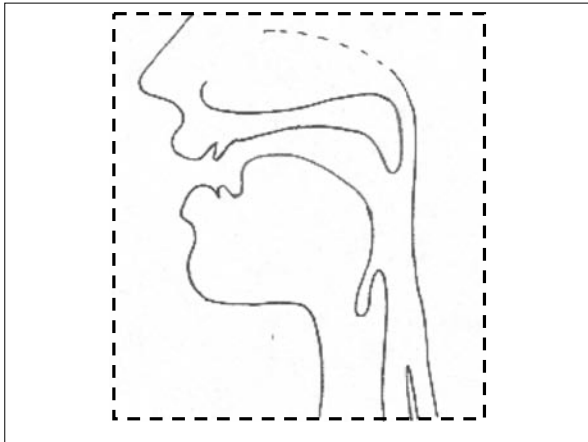
	ll-llllll	lllll-llllll	llllll-llllll	ll-llllll	llllllll	llllll	llllllll
llllll llllll	■			■		■	■
llllll llllll	■			■	■	■	
llllllllll	■	■	■	■	■	■	■
llllllllll				■	■	■	
llllllll				■	■	■	
llllllll				■		■	

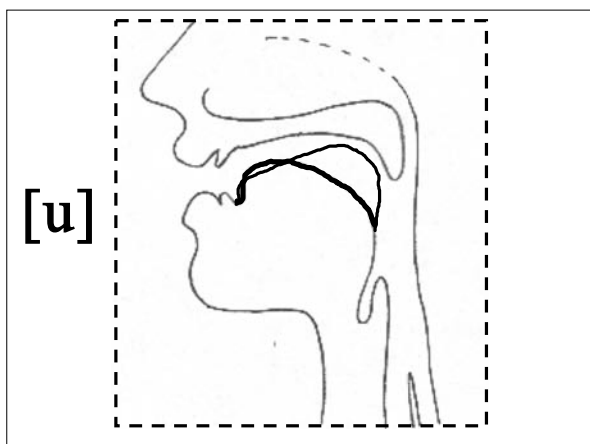
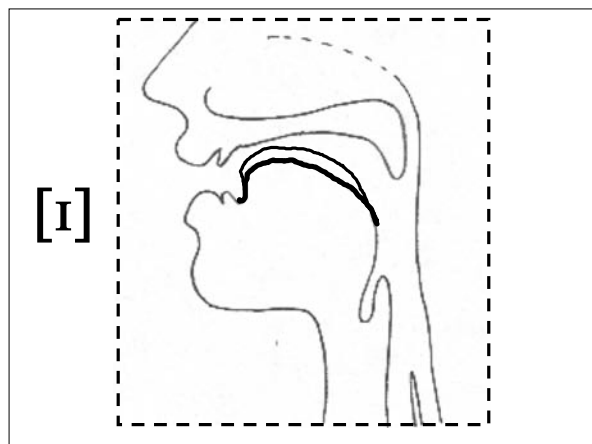
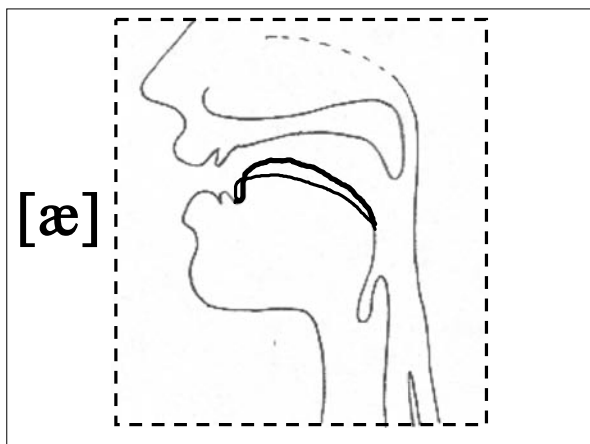
“caballo”

	ll-llllll	lllll-llllll	llllll-llllll	ll-llllll	llllllll	llllll	llllllll
llllll llllll	■			■		■	■
llllll llllll	■			■	■	■	
llllllllll	■	■	■	■	■	■	■
llllllllll				■	■	■	
llllllll				■	■	■	
llllllll				■		■	

VOWELS

What can you do to alter the shape of your vocal tract?





You can....

- (1) Raise or lower your tongue
- (2) Advance or retract your tongue
- (3) Round or spread your lips
- (4) Tense or not tense your mouth

So what vowels do you have?

i "sheep, sleep"
I "ship, slip"

So what vowels do you have?

i
I
e "laid, spade, trade"
ɛ "led, sped, tread"

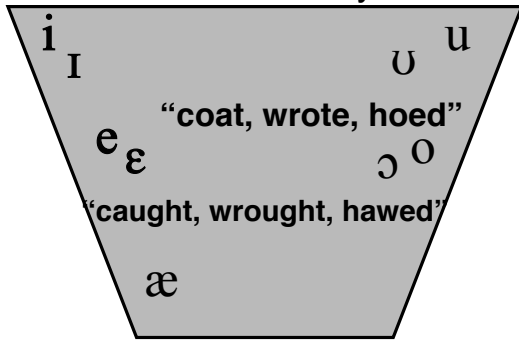
So what vowels do you have?

i
I
e **ɛ**
æ "bat, lad"

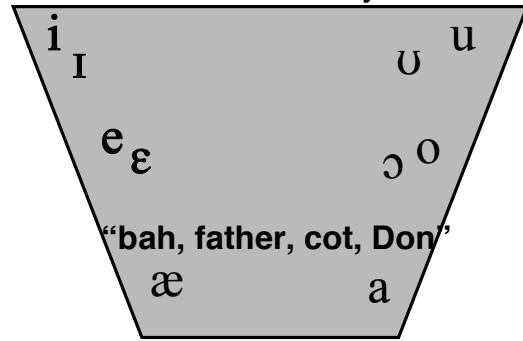
So what vowels do you have?

i "Luke, who'd, suit" **u**
I "look, hood, soot" **ʊ**
e **ɛ**
æ

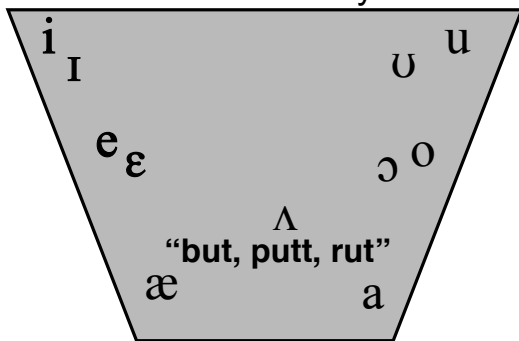
So what vowels do you have?



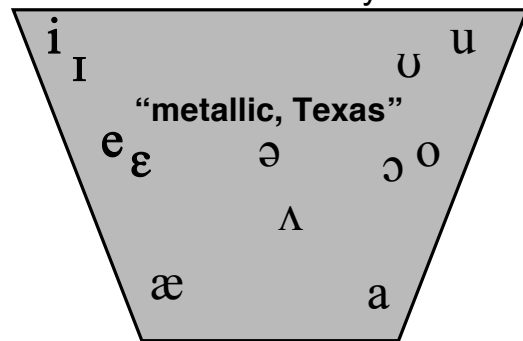
So what vowels do you have?

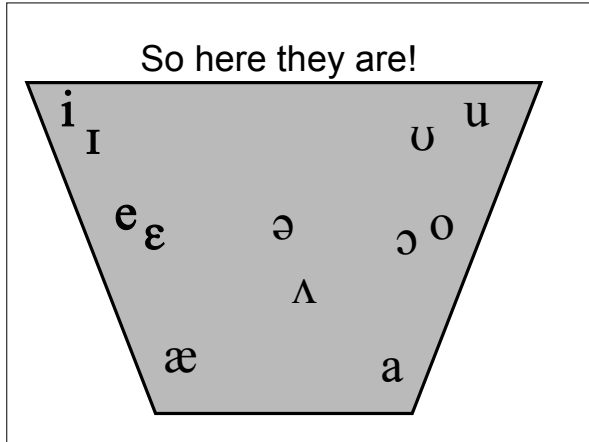


So what vowels do you have?



So what vowels do you have?





Some dialectal differences

caught/cot [Mid back lax vowel and mid back tense vowel]: many American speakers do not have both of these.

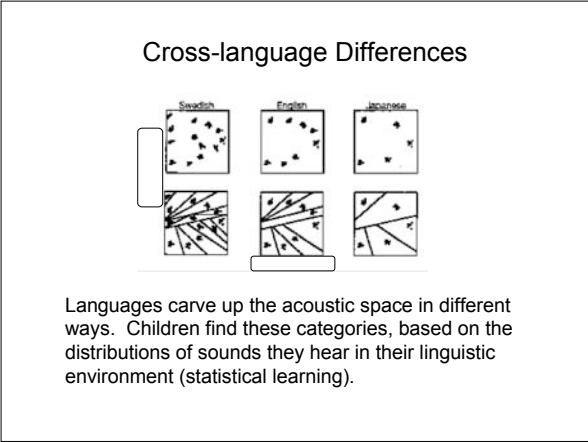
pot/father: some British and (fewer) American dialects have different vowels in these words ("pot" has a low back rounded vowel [ɒ]).

Cross-language Differences

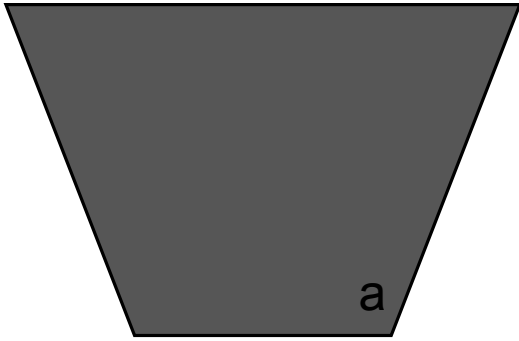
Feature Combinations

English: back vowels are rounded, others are not
 German/French has high, front, rounded vowel [y]
 Russian has high back unrounded vowel [ɯ]

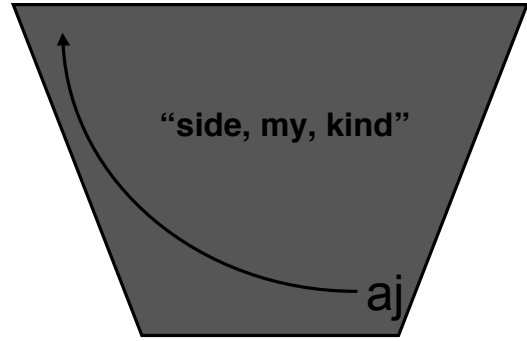
Many languages don't make the tense/lax distinction found in English (ex: Spanish [i])
 Many languages distinguish short and long vowels (unlike English), ex: Japanese [i] vs. [i:]



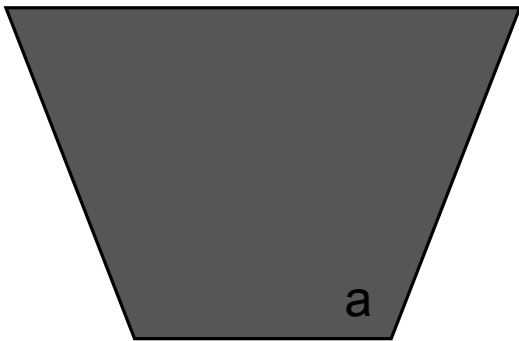
Diphthongs: Two vowel-ish sounds together



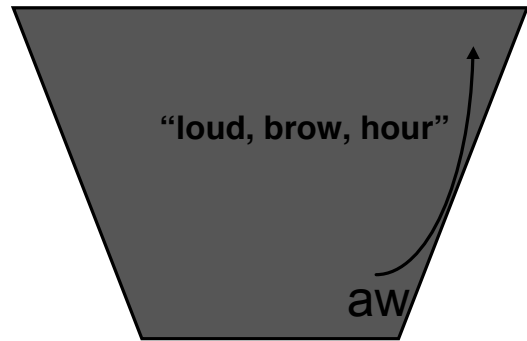
Diphthongs: Two vowel-ish sounds together



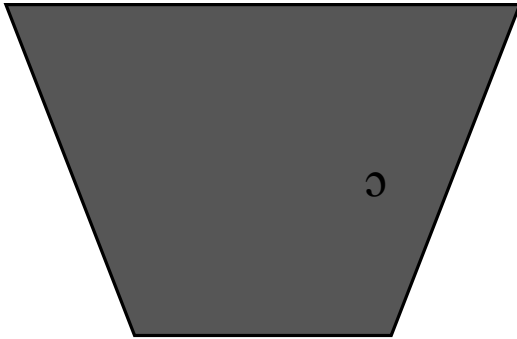
Diphthongs: Two vowel-ish sounds together



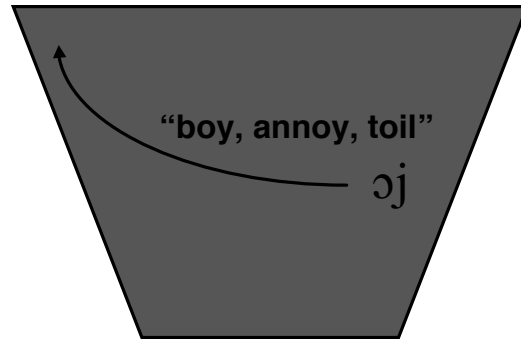
Diphthongs: Two vowel-ish sounds together



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Diphthongs: Two vowel-ish sounds together



Speech Production - Summary

Airflow set in vibration by vocal folds
Airflow modified by vocal tract

Vowels: shaping of oral cavity

Consonants: narrowing or blocking of oral/nasal cavity

Different languages choose different selections of articulatory gestures

Speech Perception

Speech production processes must be *undone* by the ear

Motions of articulators must be *reconstructed* from patterns of air vibration

Requires extremely precise hearing, possibly a system specialized for hearing speech

Substantially developed at birth



Questions?

