LIN228H1F Phonetics
Lecture 2: Vowels & Suprasementals

Wednesday, May 5, 2021   Instructor: Emily Blamire

Today's Plan

- Review basic consonant sounds of English
- Describing vowel sounds
  - Basic vowel sounds of Canadian English
- Some phonetic methodologies
- Suprasegmentals
  - Syllables
  - Stress
- Broad vs. Narrow Transcription
  - Broad vs. Narrow transcription defined (& redefined)
  - Phonemes and Allophones
  - English allophonic variation in vowels
- Announcements and reminders

Review of Consonsonants:

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Palatal	Velar	Glottal
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	
Approximant	ʍ w			ɹ		j	ʍ w	
Lateral approximant				l				

Consonant dimensions
- Voicing
- Place of articulation
- Manner of articulation

Review exercises

- Circle all the words below whose final sound is produced with air flowing through the nasal cavity:
  - pin, tab, tame, sings, sign, lamb

- Circle all the words below whose first sound is produced with a constriction at the alveolar ridge:
  - fin, sin, dumb, great, thought,
    just, lest, church, ten, nest

- Circle all the words below that contain a sound produced with a constriction at the velum:
  - care, lick, sing, that, boss, jug, ridge, mice

Describing vowels

- **Vowels** are sounds produced with no major obstruction in the vocal tract so that air can flow relatively freely through the mouth.
  - Vowels are usually **voiced** (though voiceless vowels exist in some languages), and they are usually **oral** (though nasal vowels can also be produced).
  - It is assumed that vowels are voiced and oral segments, unless they are marked otherwise using diacritics
    - [i̥] = voiceless
    - [ĩ] = nasal

Describing vowels

- Vowels are generally described using three basic dimensions:
    1. Height
    2. Backness
    3. Rounding

- **Height** and **backness** refers to the placement of the tongue in the mouth.
    - The body of the tongue can be **high** or **low** or somewhere in between (**mid**).
        - (In some conventions, high and low are referred to as "close" and "open" respectively.)
    - It can be moved towards the **back** of the mouth or towards the **front** of the mouth or somewhere in between (**central**).
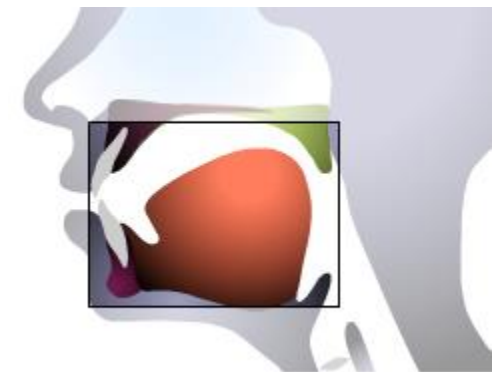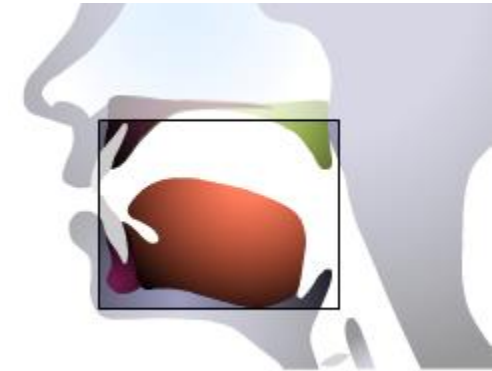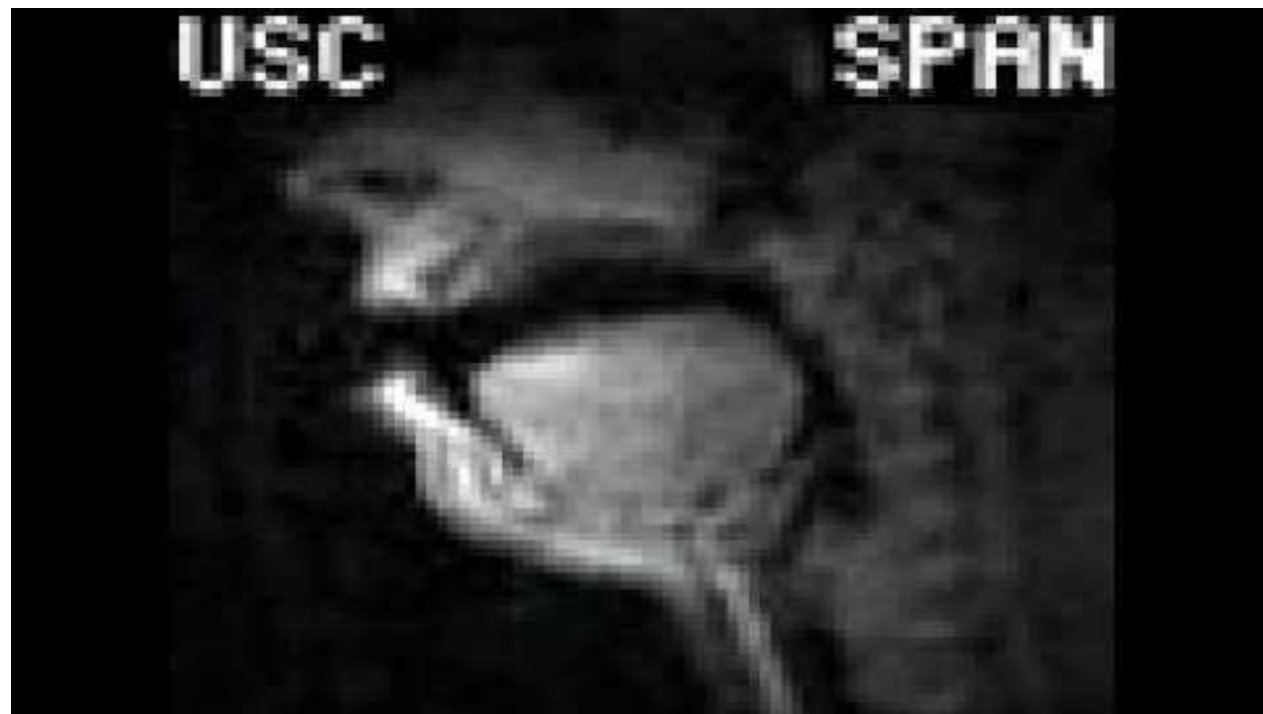
Describing vowels

- **Rounding**:
  - When you produce vowels, you can have your lips in a neutral position (**unrounded**); or you can bring them forward into an O shape (**rounded**).
    - In English, most of our back vowels are rounded, and all of our front vowels are unrounded. Rounded back vowels and unrounded front vowels are very common cross linguistically. Can you guess why?

Describing vowels

Describing vowels

A note about Cardinal vowels

- In the IPA, the term "Cardinal vowel" refers to a specific point on the IPA vowel chart's quadrilateral (pictured on this slide).

- In reality, since the vowel space is continuous, it is a matter of chance whether a vowel in a language exactly coincides with one of the reference points symbolized on the quadrilateral.

- For simplicity, linguists will use the symbol that most closely matches the average pronunciation of a particular vowel in a given language.

In this course, we will learn a widely accepted convention for transcribing and describing the vowels of Canadian English.

don't worry too much about this for now
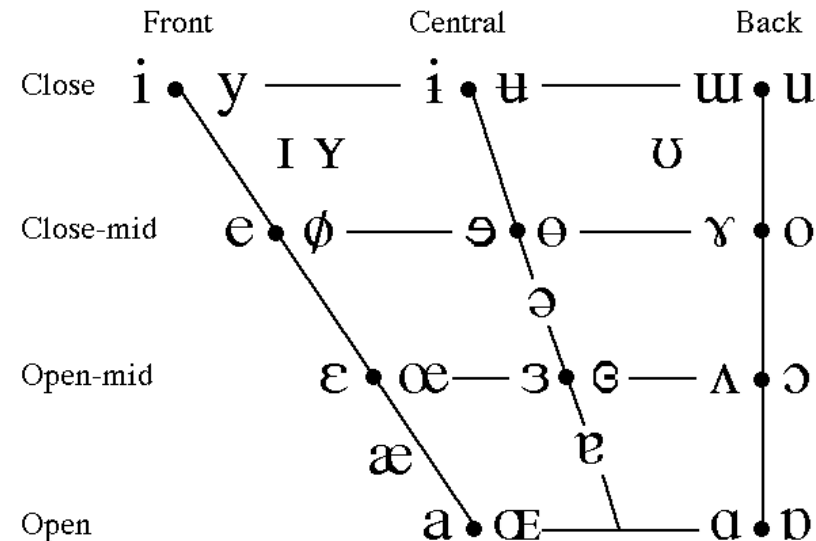
Where symbols appear in pairs, the one to the right represents a rounded vowel.

English Vowels

- **Monophthongs** are vowels that result from the tongue being in a steady position throughout the production of the vowel portion of a syllable

- Bead, Beat   [i]
- Bid, Bit   [ɪ]
- Bed, Bet   [ɛ]
- Bad, Bat   [æ]
- Body, Bought   [ɑ]
- Bud, But   [ʌ]
- Buddist, Book   [ʊ]
- Booed, Boot   [u]

	front	central	back
high	i ɪ		u ʊ
mid	ɛ	ʌ	
low	æ		ɑ

Audio clip of American English vowels:

http://www.phonetics.ucla.edu/vowels/chapter3/amengvowels.html
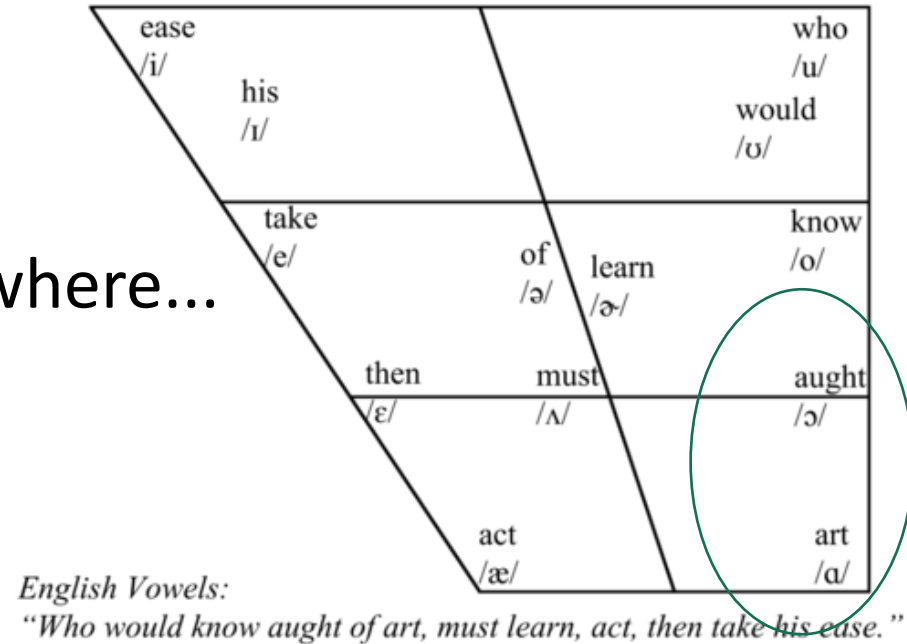
English Vowels

- Vowel distinctions not found in Canadian English:
  - /ɔ/ mid back rounded
  - /ɒ/ low back rounded

- *caught-cot* merger: Canadian English has [ɑ] where…
  - Palm [ɑ] in RP and GA
  - Lot [ɒ] in RP and [ɑ] in GA
 - Cloth [ɒ] in RP and [ɔ] in GA
  - Thought [ɔ] in RP and GA

    - You don't have to memorize these distinctions right now, just know that for most Canadian English speakers these words all have the same vowel.

English Vowels:
"Who would know aught of art, must learn, act, then take his ease."

English Vowels

- **Diphthongs** are vowels that result from the tongue moving during the production of the vowel portion of a syllable.

- Bide   [aj]
- Bowed   [aw]
- Boyd   [ɔj]
- Bayed   [ej]
- Bode   [ow]
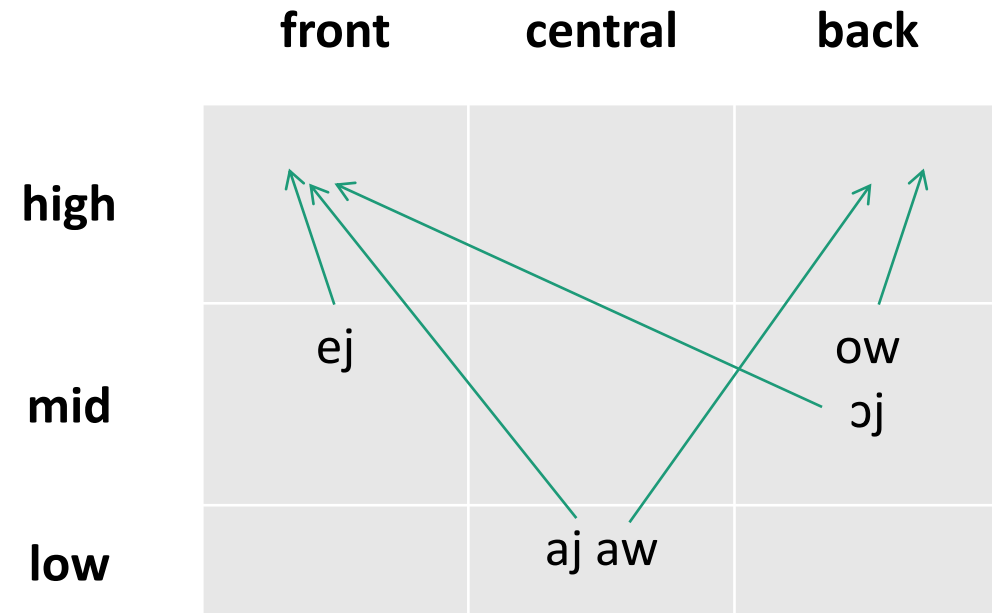
Phonetic methods: Electropalatography

- Electropalatography (EPG) – a technique that
  - uses an artificial palate with built-in electrodes
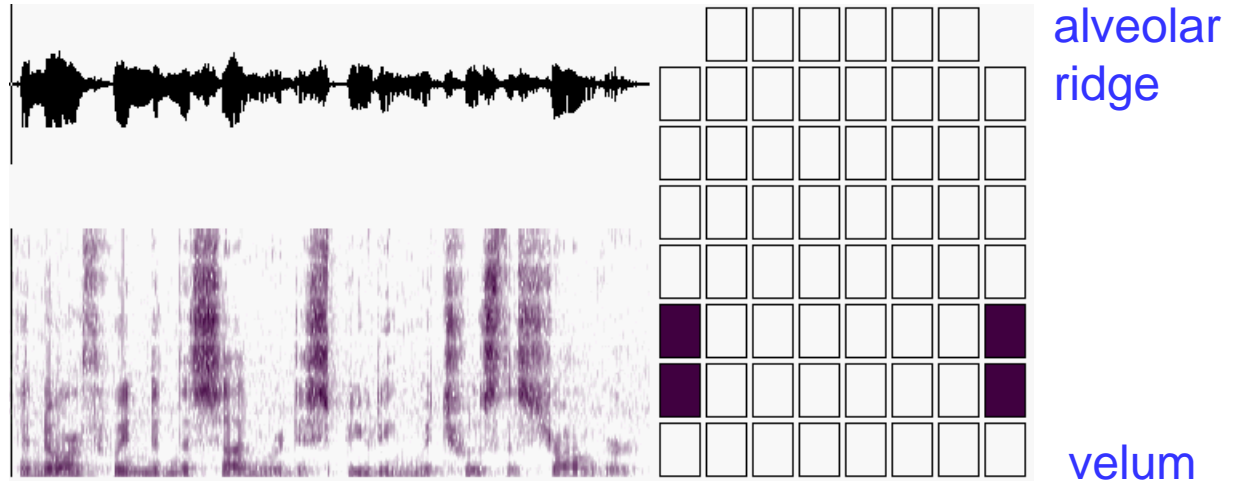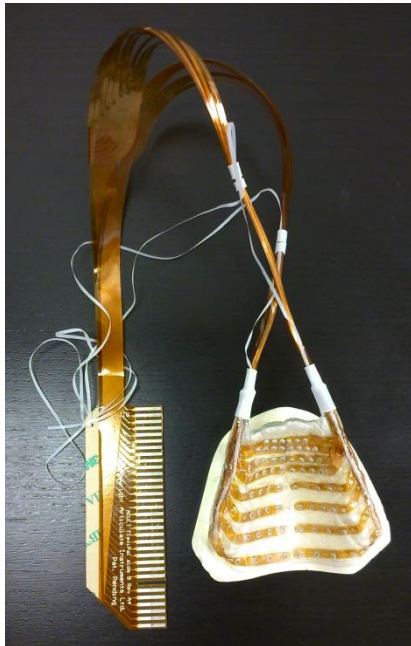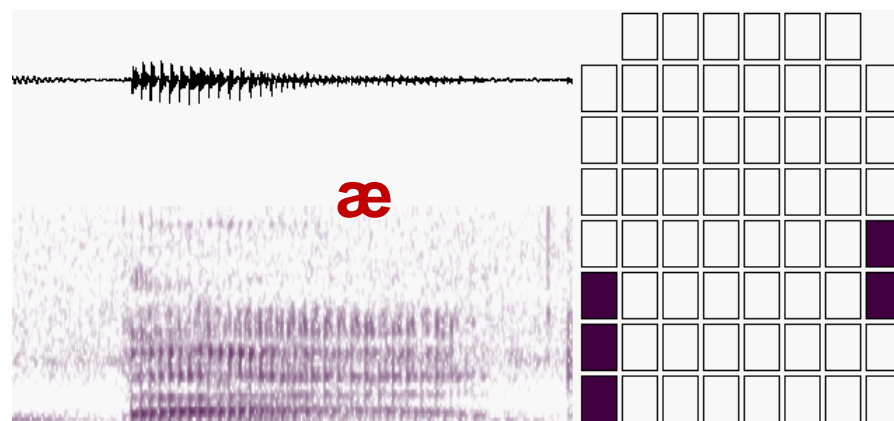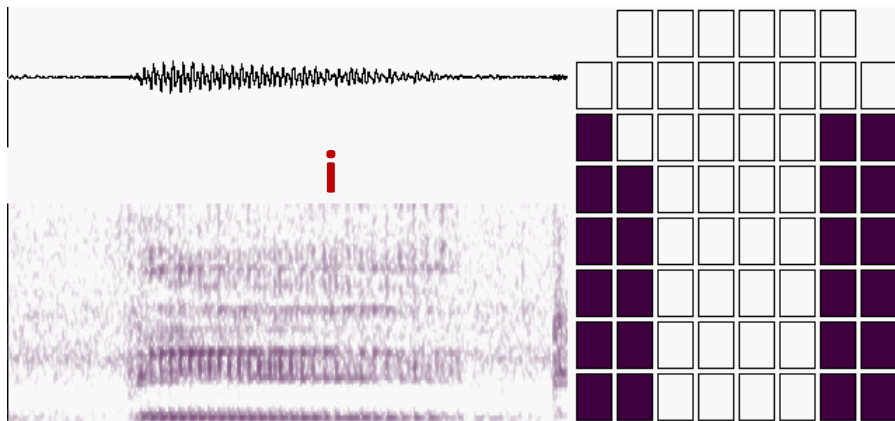 - to track the contact of the tongue and the roof of the mouth

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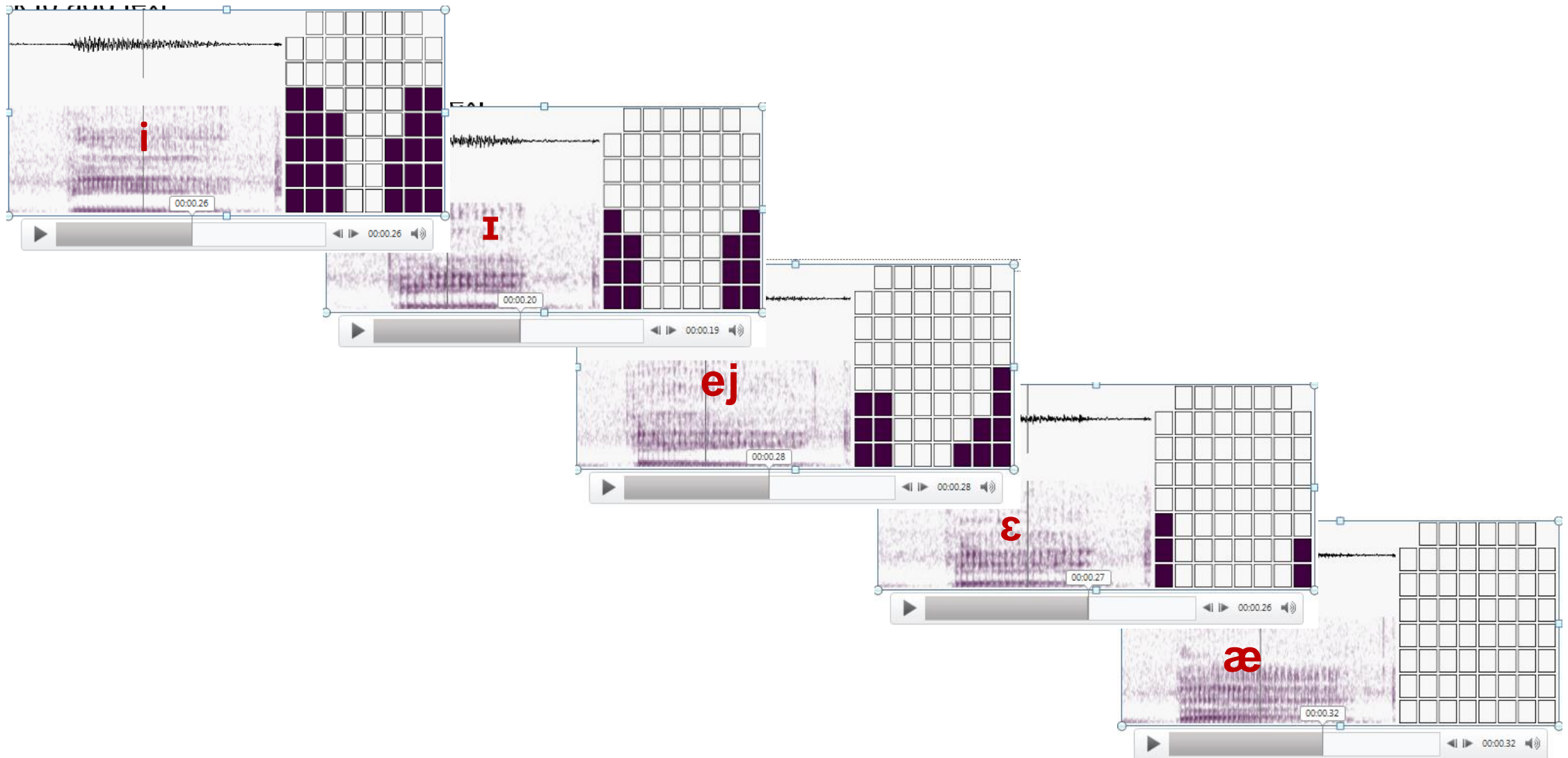

alveolar ridge

velum
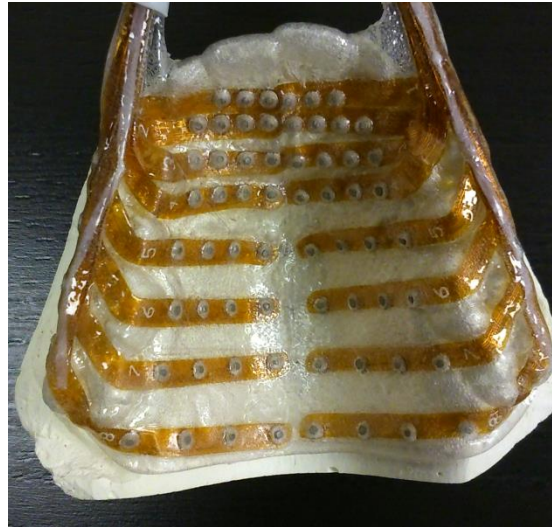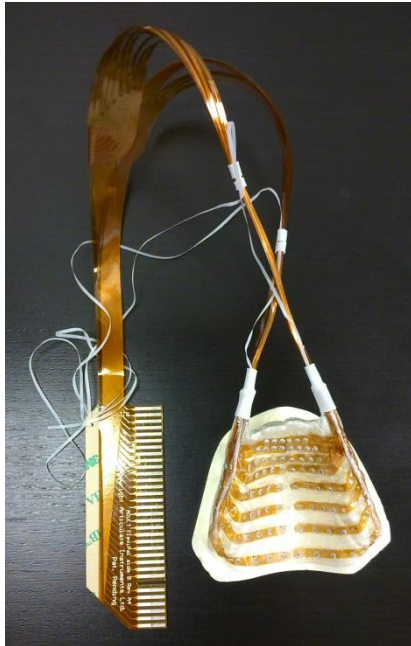
The North Wind and the Sun were disputing which was the stronger.

Vowel production: EPG

Vowel production: EPG

Vowel production: MRI
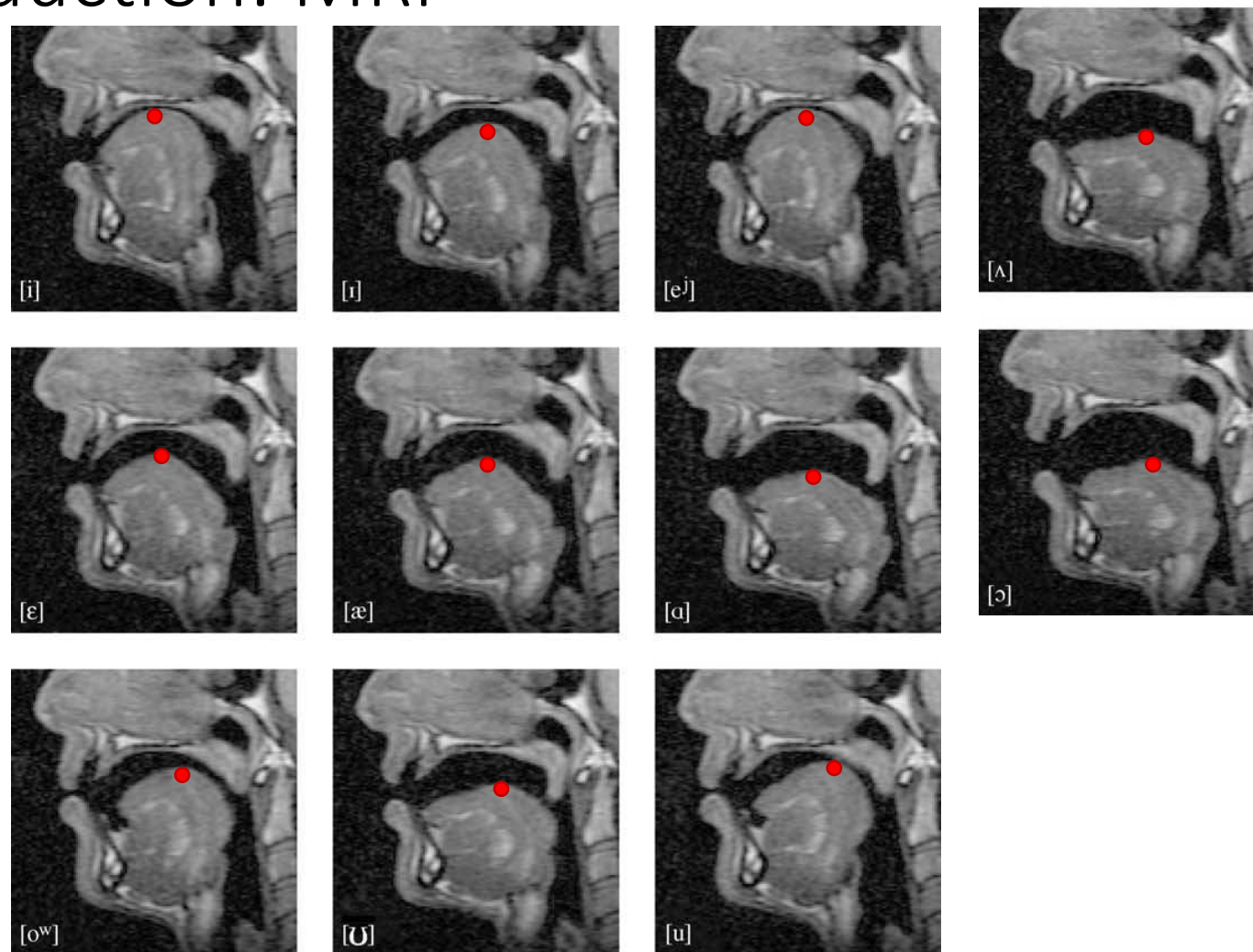
Gick et al. 2002. MRI evidence for commonality in the post-oral articulations of English vowels and liquids. *Journal of Phonetics,* 30, 357–371.

Syllables

- Native speakers of a language have strong intuitions about the fact that words are made up of syllables.
    - In general, we can think of syllables as "pronounceable" parts.

Intercontinental: *In*   *ter*   *con*   *ti*   *nen*   *tal*

- Linguists divide the syllable into three parts:
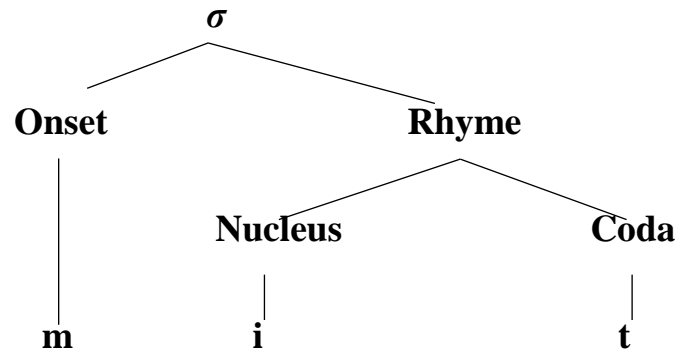
- The position of a consonant within a syllable has an effect on the way it is pronounced
- The type of syllable that a vowel is in also has an effect on the way it is pronounced

Syllables

- Different sequences of sounds are allowed in different parts of a syllable.
- The way sounds are allowed and not allowed to pattern together in a language is called **phonotactics**
  - In English, you can have the cluster /kw/ in the onset position of a word, but not in the coda
    - /kwin/ 'queen'= ✔️ but /nikw/ = ❌
  - Prohibited sound combinations are called **systematic gaps**
  - Sound combinations that are allowed, but just don't exist are **accidental gaps**

Syllables and English vowels:

- Vowels in English are also distinguished according to whether they are **tense** or **lax**
  - The terms tense and lax do not refer to a consistent phonetic property but rather are used to label sets of vowels that behave differently with respect to the <u>phonotactics </u>of English (i.e. how they pattern in the language).
    - Tense vowels: i, ej, aj, aw, u, ow, ɑ, ɔj, (ɔ)
    - Lax vowels: ɪ, ɛ, æ, ʌ, ʊ, ə*

- Phonotactic restrictions
  - Tense vowels can occur in <u>open</u> (ending in a vowel) or <u>closed syllables</u> (ending in a consonant).
  - Lax vowels can only occur in closed syllables.
  - **Schwa [ə]** is exceptional in this respect. It is a lax vowel which can occur in open syllables. (e.g. sofa [sowfə])

Stress

- Stress refers to the impression that a listener has that one syllable is somehow more prominent than other syllables around it.
  - In English, this often involves:
    - Greater loudness
    - Higher pitch
    - Greater length
  - **Primary stress** is indicated in IPA with a raised line before the stressed syllable.
    - *I want to make a salad, so I need to buy some <u>produce</u>.* /ˈpɹowdus/
    - *In this course, we'll learn how to <u>produce</u> different speech sounds.* /pɹəˈdus/
  - Some words will also have **secondary stress**, indicated with a lowered vertical line before the stressed syllable.
    - *Helicopter* /ˈhɛlɪˌkɑptəɹ/

Stress - Schwa [ə] vs. Caret [ʌ]

- [ə] is a mid central unrounded vowel that occurs in unstressed syllables.
  - It is known as a "reduced" vowel, and its duration is much shorter than other vowels.
- [ʌ] is also a mid central unrounded vowel and the two vowels sound very similar.

  - The choice between the two is dependent on stress.

	front	**central**	**back**
high	i		u
	ɪ		ʊ
mid		ə	
	ɛ	ʌ	(ɔ)
low	æ		ɑ

Stress - Schwa [ə] vs. Caret [ʌ]

I WANNA BE A SCHWA.
IT'S NEVER STRESSED
quickmeme.com
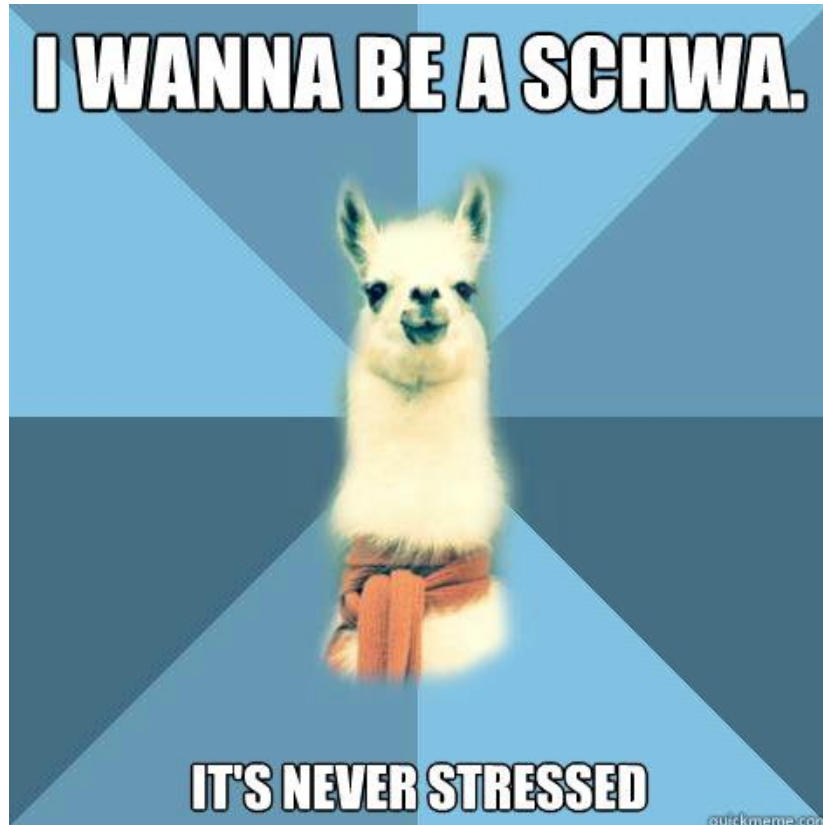
- Vowels are often reduced to [ə] in unstressed syllables.

- Strong and weak forms
  - *at* - /æt/ vs. [ət] or [əʔ]
  - *the* - /ði/ or /ðʌ/ vs. [ðə] or [ðɪ]

- We will use
  - **[ʌ]** to transcribe a mid, central vowel that occurs in a **stressed syllable** and
  - **[ə]** to transcribe a mid, central vowel in **unstressed syllables**.
    - The only time we may transcribe [ə] in stressed syllables is when it is followed by /ɹ/
    - *turn* [təɹn]

Review exercises

- Define the vowels

|	height	backness	rounding
adder			
h**o**p			
f**a**ther			
s**i**ng			
ether			
s**ui**t			
s**u**nny			
s**e**ll			
s**ee**d			

Broad vs. Narrow Transcription

- There is no such thing as *the* transcription of a word. Strictly speaking, you can only transcribe a single utterance at a single moment in time.

- If you want to go beyond a single utterance, to describe how the person or how a group of speakers pronounce an utterance in general, then you have to start making abstractions—which details to include and which to ignore.

- It's common to distinguish between two kinds of transcription, based on how many details the transcribers decide to ignore:
  - **Narrow transcription:** captures as many aspects of the pronunciation as possible.
    - Using **diacritics** provided by the IPA, it's possible to make very subtle distinctions between sounds.
  - **Broad transcription** (or <u>phonemic</u> transcription): captures only enough aspects of a pronunciation to show how that word differs from other words in the language.

English Allophonic Variation in Vowels

- Two sounds are contrastive if they are able to create a difference in meaning in a given language.
  - For example, in English [i] and [u] are contrastive.
  - There are many examples illustrating this: *bead* vs. *booed*, *deed* vs. *dude*, *mean* vs. *moon,* etc.

- Sounds that are contrastive are called **phonemes** (of a given language).

- Not all sounds that occur in a language are able to create a difference in meaning.
  - Sounds that do not contrast in a language, are referred to as **allophones** of one phoneme.

English Allophonic Variation in Vowels

/phoneme/
/u/

[allophone]   [allophone]
[u]   [ũ]
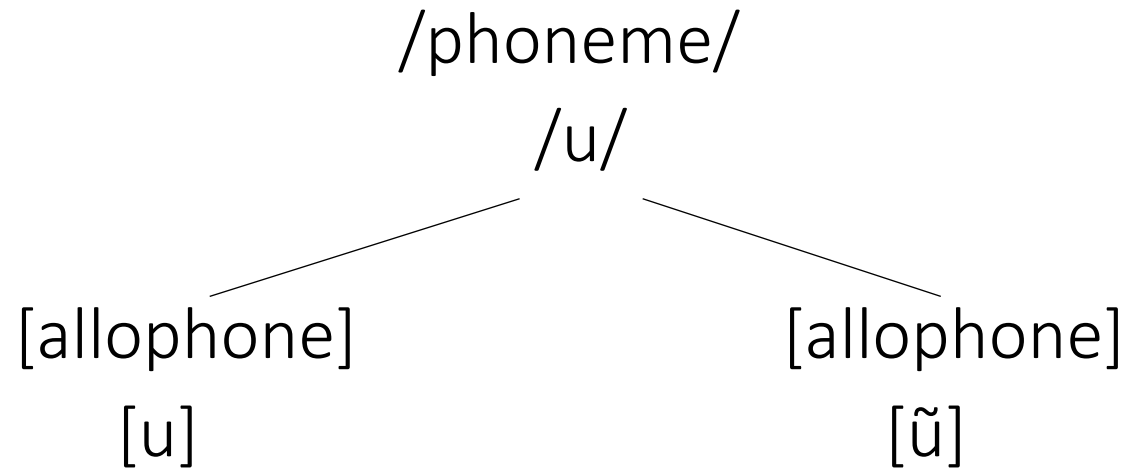
English Allophonic Variation in Vowels

- Length:
  - Tense vowels and diphthongs are always longer than lax vowels.
    - tense V, diphthong > lax V
  - For simple vowels this **inherent** length can is indicated with a **raised dot** in narrow transcription.
  - For diphthongs inherent length is not shown using a raised dot but is conveyed by the **use of two characters** in the representation of the diphthong.

|	
beat	[biˑt]
bait	[bejt]
bit	[bɪt]

English Allophonic Variation in Vowels

- Length:
  - All vowels are lengthened when they occur before a voiced consonant or syllable finally
    - before voiced coda, empty coda > before voiceless coda
  - This is **contextual** length - dependent upon the phonetic environment in which the vowels occur. It is also shown with a **raised dot**
    - If a vowel already has inherent length and is in a position where it is contextually lengthened this additional length is shown with two dots (a colon).
  - When diphthongs receive contextual length this is shown with a raised dot following the vowel portion of the diphthong

bead	[biːd]
made	[meˑjd]
bid	[bɪˑd]

English Allophonic Variation in Vowels

Inherent length: acoustic vowel duration

[biːd]   [bɪ·d]
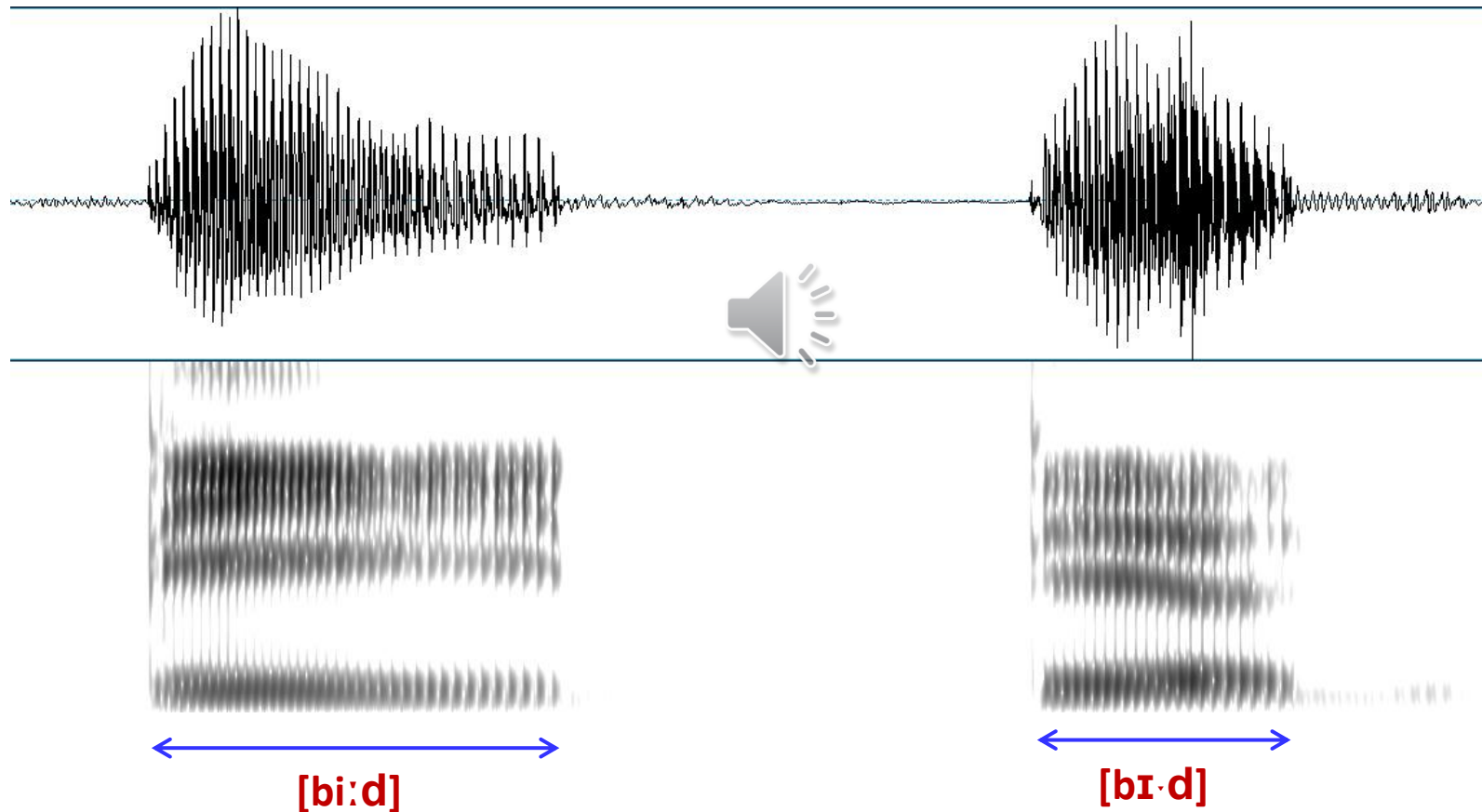
English Allophonic Variation in Vowels

- Length:
  - Summary of inherent and contextual length on vowels in English.
  - Note that only stressed vowels will have length shown

Inherent: *beat* **[biˑt]**, *bait* **[bejt]** > *bit* **[bɪt]**   Contextual: *bead* **[biːd]** , *bee* **[biː]** > *beat* **[biˑt]**

	Before a voiceless consonant	Before a voiced consonant	Syllable finally
Diphthong	Bait [bejt]	Spade [speˑjd]	Day [deˑj]
Tense monophthong	Beat [biˑt]	Bead [biːd]	Bee [biː]
Lax monophthong	Bit [bɪt]	Bid [bɪˑd]	-----

[ˑ] = half-long

[ː] = long

English Allophonic Variation in Vowels

- In English, only some vowels may occur before /ɹ/.
  - / ɪ ɛ ɑ ɔ ʊ ə aj aw ɔj /
- Before syllable-final /ɹ/ there is no contrast between vowels that have the same specifications for height and backness (i/ɪ and u/ʊ).
  - The actual vowel quality found in words like *beer* and *poor* is somewhere between the two.
  - For consistency with the textbook, we will use the [ɪ] and [ʊ] symbols to represent those sounds.
  - e.g. fear [fɪɹ] and poor [pʊɹ]
- Similarly, there is no contrast between [o] [ow] and [ɔ] before /ɹ/ in Canadian English
  - We will use the [ɔ] symbol to represent a mid back rounded vowel before [ɹ] since that's the closest symbol to what is actually pronounced.
  - e.g. *court* [kɔɹt]
- The patterning of sounds before /ɹ/ can be said to be due to a lack of tense and lax distinction.

English Allophonic Variation in Vowels

- Consider words such as 'her', which we would transcribe as /həɹ/.
  - Can you feel that there is a distinct vowel /ə/ followed by a consonant /ɹ/? Or do they seem to blend into one?
  - In most naturally produced speech, Canadian English speakers will produce a single "r-coloured" a.k.a. rhoticized vowel: [ɚ]
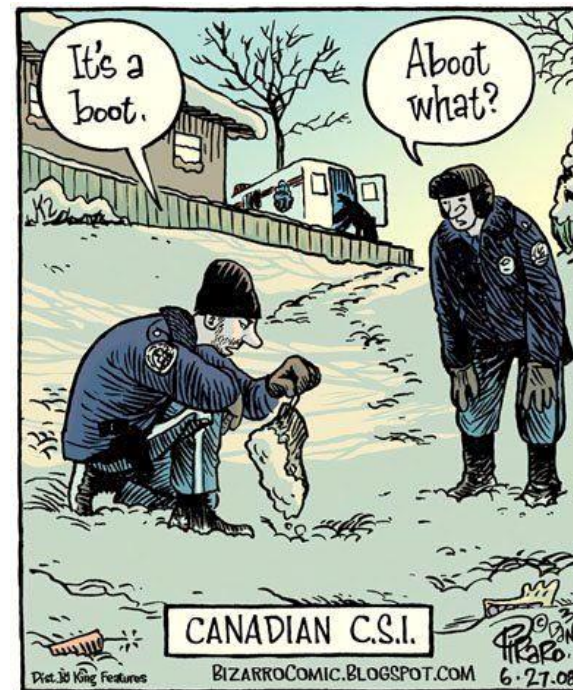
English Allophonic Variation in Vowels

- **Canadian Raising:**
  - The diphthongs /aj/ and /aw/ begin at a higher place of articulation when they occur before voiceless sounds in Canadian English.

Before a voiced consonant	Syllable finally	Before a voiceless consonant
Loud [la·wd]	How [ha·w]	Snout [snʌwt]
Hide [ha·jd]	Fly [fla·j]	Bite [bʌjt]

- [ʌj]   right, like, wife
- [aj]   ride, lie, wives
- [ʌw]   lout, mouth, a house
- [aw]   loud, how, to house

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English Allophonic Variation in Vowels

Can you fill in the correct narrow transcription of the vowels?

- **Length**

- **Canadian raising**

loud /lawd/   *how* /haw/   *snout* /snawt/

[l_____d]   [h_____w]   [sn_____t]

hide /hajd/   *fly*   /flaj/   *bite* /bajt/

[h_____d]   [f_____j]   [b_____t]

Review exercises

- Define the consonants

	place	oral/nasal	voiceless/voiced
a**dd**er			
ho**pp**er			
fa**th**er			
si**ng**ing			
e**th**er			
ro**bb**er			
su**nn**y			
se**ll**ing			
plea**s**ure			

Announcements and Reminders

- Your first online assignment is due by the end of the day Saturday
  - It will be available by noon tomorrow. You can only submit it once but there is no time limit

- For next week, you should read:
  - All of SoL Chapter 3 plus EL 4.2 and 3.1-3.6
  - Read SoL Chapter 6, focusing on pages 108-11 (background – RP), 120-121 (General American), 123-126 (Canadian and Newfoundland English). Skim the rest.
  - Plus, Chapters 1, 2, 4, and 5, plus EL 2.1-2.8 (if you haven't already done so)

Handwriting IPA vowel symbols