LING 101

Intro to Language

- Natural classes
- Stating allophone environments

Background reading:

• CL Ch 3, sec 1 and Appendix

1. Allophones of a phoneme vs. two phonemes

Last time, we discussed:

- How can we tell if two phonetically different sounds belong to different phonemes or to the same phoneme in a language we are analyzing?
- → We have to **look at data** from the language we are analyzing and **make a case** for the status of the pair of sounds **in that language**

1. Allophones of a phoneme vs. two phonemes

- Step 1. Look for a minimal pair
- **Step 2.** Consider the **environments** where the sounds occur are they:

predictable (non-overlapping)?
unpredictable (overlapping)?

Our focus this time is:

Step 3. If you have found that two sounds are allophones of the same phoneme, state the environments where each allophone occurs

But first, some background on **natural classes**

- Which of the sounds of English can be **aspirated**?
 [p] [t] [k]
- Why these sounds and no others?
 - → These are the only sounds of English that are voiceless oral stops

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- This kind of pattern is not unusual!
 - In the languages of the world, groups of sounds with some property or properties in common tend to behave as a group in some way

- A set of sounds with some *property or properties in common* is called a **natural class**
- If natural classes often **behave as a group** in native-speaker language behavior, what does that tell us about the mental grammar?
 - Natural classes are determined by sound properties
 - So, the mental grammar uses sound properties to represent the sounds of language

→ "Phonetic" properties are **mentally relevant**!

- What does it mean to say this? The mental grammar uses sound properties to represent the sounds of language
 - The mental grammar doesn't actually "see" a speech sound like [u] or [t]
 - Instead, it "sees" a **set of properties** that represents each sound
- In the mental grammar...

[u] is represented as: high back round tense vowel[t] is represented as: voiceless alveolar oral stop

- Practice: What properties can we use to describe each of these groups of sounds as a single natural class, while *excluding* other sounds as specified?
 - (a) [pgmdŋt] but not [sejw]
 - (b) $[f\theta s \int h]$ but not [tzvb]
 - (c) [iowuaej] but not [Iækm]
 - (d) [iɪ] but not [æowεŋʧ]

- Practice: What properties can we use to describe each of these groups of sounds as a single natural class, while *excluding* other sounds as specified?
 - (a) [pgmdŋt] but not [sejw] stops
 - (b) $[f\theta s \int h]$ but not [tzvb]

voiceless fricatives | *it may take >1 property to define a class*

- (c) [iowuaej] but not [Iækm] tense
- (d) [iɪ] but not [uʊæowɛŋʧ] high unrounded

Returning to the topic of allophones:

- Step 3. If you have found that two sounds are allophones of the same phoneme, state the environments where each allophone occurs
- Since putting the allophones of a phoneme in the right places is the job of the **mental grammar**
 - and the mental grammar **represents sounds** in terms of their **properties**
 - → we always state the environment of an allophone in terms of sound properties

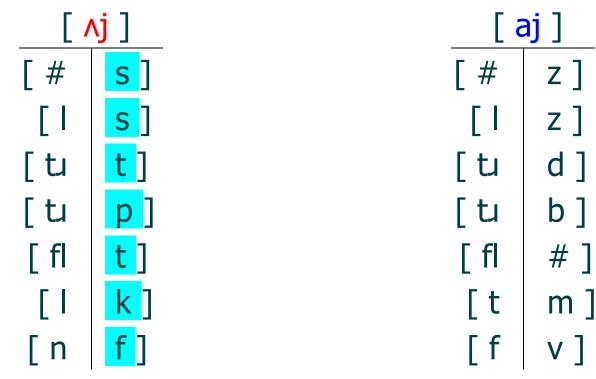
• Returning to our Canadian Raising example...

(modified from Table 3.3 in CL, p 74)

[<mark>ʌj</mark> s]	`ice'	[ajz]	'eyes'
[I <mark>ʌj</mark> s]	`lice'	[l <mark>aj</mark> z]	`lies'
[ˈuʌjt]	`trite'	[tı <mark>aj</mark> d]	`tried'
[tɪ <mark>ʌj</mark> p]	`tripe'	[tı <mark>aj</mark> b]	`tribe'
[fl <mark>ʌj</mark> t]	`flight'	[flaj]	`fly′
[`like'	[tajm]	`time'
[nʌjf]	`knife'	[f <mark>aj</mark> v]	`five'

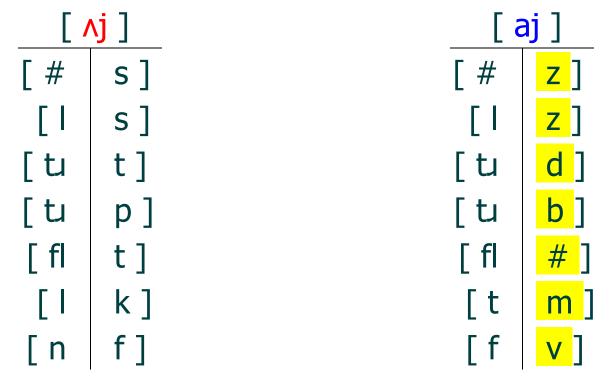
Can either environment (or both) be **stated as a natural class**?

Can either environment be stated as a natural class?



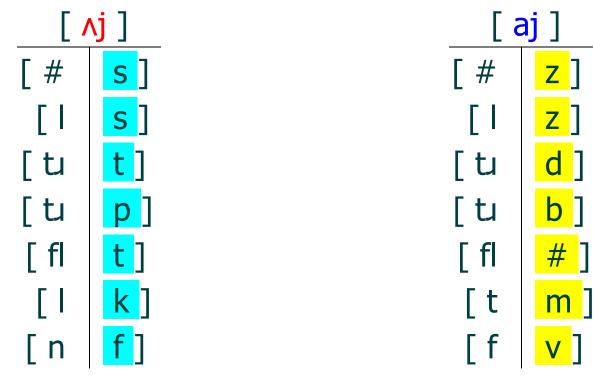
- [**^**j] appears before [s, t, p, k, f] in this data set
 - These sounds are all **voiceless** | *this is a natural class!*

Can either environment be stated as a natural class?



- [aj] appears before [z, d, b, m, v, #] (# = edge of the word)
 - No shared properties (because of #)
 - But this list does **not** include any **voiceless** sounds

Can either environment be stated as a natural class?



- Our analysis of the environments of these diphthongs:
 - [ʌj] appears before **voiceless** sounds
 - [aj] appears elsewhere

4. Determining the status of two sounds

Picking up the discussion from before...

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Now we can expand on this:

- At least one of the two allophones should have an environment that is statable as a **natural** class using properties of sounds
- If one allophone has an environment that is
 "wherever the other allophone *doesn't* occur",
 we can state its environment as **elsewhere**

5. Preview of the next topic

- So far, we have seen:
 - **Phonemes** are mental sound categories
 - One phoneme may have multiple **allophones**
 - In that case, some factor in the environment described in terms of sound properties determines which allophone appears
- Next:
 - How does the mental grammar make sure that the correct allophones appear in the correct environments? → Phonological rules