Today's topics:

- **Phonology: Sound categories in the mental grammar**

Background reading:

- *CL* Ch 3, sec 1

0. Course info — announcements & reminders

Welcome back!

- We hope you all had a chance to get rested and (re)settled over the last week
- **Starting after today:** Zoom *passcode* required for all Zoom "meetings" related to LING 101
  - Our Zoom links will include the passcodes, so it is still one-click access for you
  - But, for security, our Zoom links will take you through the LING 101 Sakai site (when you click the link, it will ask you to log in on Sakai before continuing to the Zoom meeting)

0. Course info — announcements & reminders

- **Some new or updated course policies**:

  We are in the process of creating a "Course policies" page on the course web site for collecting links to policies such as the following:

  - Recitation grading: Attendance, participation
  - If you are sick (COVID-19 or otherwise)
  - Class recordings: access and student privacy
  - New UNC-CH *Pass/Low pass/Fail* grading option

  We expect to have this page updated by the end of the week — please contact us with any questions

0. Course info — announcements & reminders

- Remember to **use the "Daily syllabus" page** on the course web site to keep track of readings, assignments, and other course materials
- About **HW assignments**
  - Assigned Wednesdays and due Mondays
  - We try to release HW grades (on Sakai) each week by recitation time—12:00 noon on Fridays
    (There were some Sakai errors concerning the release of HW #1 grades, but we are fixing this now)
  - M Sept 7 is a holiday, so HW #2 is due W Sept 9
    (Grading may take longer than F Sept 11 as a result)

0. Course info — announcements & reminders

- *Reminder:* **Wed** is **self-paced learning** for **all** students
  - Each W learning unit has one or more **learning assignments**, due Th (on Sakai in "Tests & Quizzes")
  - The **time you spend** on each W learning unit includes both "class time" and "out-of-class time"
    - There may be assigned **readings** due for W
    - You will need time to **work through** the W material and then **review** it to learn and understand it
    - The **learning assignment** helps you check your understanding and shows what you need to review

Each "credit hour" of a course represents the equivalent of one hour of class time and two hours of out-of-class work

0. Today's plan

- Setting the stage — phonetics and phonology
- When are two speech sounds "different"?
- Sounds in contrast
- "Same" and "different" sounds again
- Phonemes and allophones

1. Setting the stage—phonetics and phonology

- Review: Consonant and vowel symbols
  - The better you know sound symbols and properties, the more quickly you will master **phonological rules**

[ɪf ju kn̩ ɹid ðɪs
ju ɹ̩ duɪŋ wɛl
wɪθ fənɛtɪks]

- Note: *Syllabic consonants* are indicated with [ˌ] below the consonant symbol, as in [n̩] and [ɹ̩] above
  - We're not asking you to know this, but you might see it

1. Setting the stage—phonetics and phonology

- **Phonetics**: The **physical** articulation (and acoustics, and perception) of speech sounds

  Phonology: How speech sounds are classified and modified by the **mental grammar**

- Now that you have learned some basic **phonetics**, it's time to explore some of the things that the *mental grammar* does with speech sounds: **phonology**

2. When are two speech sounds “different”?

- A very important point to remember:

  Two speech sounds that are

  phonetically (physically) different

  are **NOT** always treated as

  two different **contrastive sound categories**

  in the **mental grammar** of a particular language

2. When are two speech sounds "different"?

- Two speech sounds that are **phonetically** different are **NOT** always treated as two different **contrastive sound categories** in the **mental grammar** of a particular language

- Are the "p"-sounds in the English words *pan* and *span* the same sound?
  - Physically/phonetically: **no**
    (see discussion of *aspiration* in *CL* Ch 2, sec 5.5)
  - Native speakers of English: Before you took this course, what would you have said?

2. When are two speech sounds “different”?

- Speech-analysis software demo: **Hindi** vs. **English**

Hindi:	[pʰal]	[bal]	[pal]
	‘knife blade’	‘hair’	‘take care of’
English:	[pʰawt]	[bawt]	[spawt]
	‘pout’	‘bout’	‘spout’

  - More Hindi examples are available from Peter Ladefoged’s web site for the book *Vowels & Consonants*

2. When are two speech sounds "different"?

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	'knife blade'	'hair'	'take care of'
English:	[pʰawt]	[bawt]	[spawt]
	'pout'	'bout'	'spout'

- Both languages **use** all three sounds
- *But:* The way these sounds are **classified by the mental grammar** is different in the two languages

3. Sounds in contrast

- Every language has an inventory of speech sounds that are **in contrast**
  - This means that they are treated as different categories in the **phonology** component of the **mental grammar** of a native speaker

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- Every language has an inventory of speech sounds that are **in contrast**
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- A mental sound category is called a **phoneme**
  - Note: it's not "phenome"; ***phone*** = 'sound'

contrasting sounds = separate mental categories
= separate **phonemes**

3. Sounds in contrast

- If two sounds are **in contrast**, we can often find a **minimal pair** of words for those two sounds (see *CL* Ch 3, sec 1.2)

  A **minimal pair** consists of:

  - **two words** that
  - **differ** in only **one sound** and
  - are otherwise **identical** (including the *order* of the sounds in the word)

3. Sounds in contrast

- A **minimal pair** consists of:
  - **two words** that
  - **differ** in only **one sound** and
  - are otherwise **identical** (including the *order* of the sounds in the word)
- *Try it:* Is each pair of words below a minimal pair? If so, what sounds does it show to be in contrast?

(a) *Sue, zoo*

(b) *leap, lip*

(c) *I've, vie*

(d) *boat, both*

Hint: **Transcribe** these words (in IPA) to analyze them

3. Sounds in contrast

- *Try it:* Is each pair of words below a minimal pair? If so, what sounds does it show to be in contrast?

(a) *Sue, zoo*

[su] [zu]

(b) *leap, lip*

[lip] [lɪp]

(c) *I've, vie*

[ajv] [vaj]

(d) *boat, both*

[bowt] [bowθ]

3. Sounds in contrast

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[su] [zu]

(b) *leap, lip*

[lip] [lɪp]

(c) *I've, vie*

~~[ajv] [vaj]~~ ×

(d) *boat, both*

[bowt] [bowθ]

3. Sounds in contrast

- If two sounds are **in contrast** in a language, then they ***must*** belong to **different mental categories**
  - The mental lexicon couldn't use two sounds to *distinguish* words if the mental grammar didn't treat them as *distinct* categories

3. Sounds in contrast

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- Example: If I say [bowt] and [bowθ], an English speaker knows those two words mean different things (and which is which)

3. Sounds in contrast

- If two sounds are **in contrast** in a language, then they ***must*** belong to **different mental categories**

- Example: If I say [bowt] and [bowθ], an English speaker knows those two words mean different things (and which is which)
  - This tells us that the mental grammar and lexicon of an English speaker treats /t/ and /θ/ as two *different* categories
    = two *different* **phonemes**

3. Sounds in contrast

- *Try it:* Are [p^h] [b] [p] in contrast in Hindi?
  - From this, what do we conclude about the status of these consonants as **phonemes** in Hindi?

Hindi:	[p^hal]	[bal]	[pal]
	‘knife blade’	‘hair’	‘take care of’

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- These three sounds are all **in contrast** in Hindi
  - Minimal pair for [p^h]/[b], [p^h]/[p], [b]/[p]

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- These three sounds are all **in contrast** in Hindi
  - Minimal pair for [p^h]/[b], [p^h]/[p], [b]/[p]
- Because they are all in contrast, they must all be **separate phonemes** in Hindi

4. “Same” and “different” sounds again

- There is a sense in which [p] and [p^h] *are* “the same” to a native English speaker, because they belong to the **same phoneme**
  - There is one **mental sound category** /p/
  - It is *pronounced* as [p] in some contexts and [p^h] in others (more on this idea in a minute)
- When people think *consciously* about sounds, they tend to think at the phoneme level

4. “Same” and “different” sounds again

- What we have seen:
  - A Hindi speaker hears [p] and [p^h] as “different”, because they belong to **different phonemes** in Hindi
  - Many English speakers hear [p] and [p^h] as “the same”, because they belong to the **same phoneme** in English
- Your phonology controls your brain!
  (that is, it influences your speech perception)
  - The phonological system of your **mental grammar** has a big effect on how you mentally categorize a phonetic/physical speech sound

4. “Same” and “different” sounds again

- Many people find it ***hard to believe*** that…
  - two sounds that belong to the **same** phoneme for them (“the same sound”) could *possibly* be **separate** phonemes (“different sounds”) in another language
  - two sounds that are **separate** phonemes for them (“different sounds”) could *possibly* belong to the **same** phoneme (“the same sound”) in another language

→ Evidence for **mental grammar**!

5. Phonemes and allophones

- **phoneme** → **mental** sound category **(/ /)**
- **allophone** → **physical** realization of a phoneme **([ ])**

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- **phoneme** → **mental** sound category **(/ /)**
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- Some phonemes have ***multiple*** allophones

Hindi:

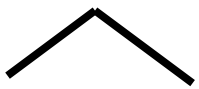
/ p / / p^h /

| |

[p] [p^h]

English:

/ p / **phonemes**



[p] [p^h] **allophones**

5. Phonemes and allophones

- Words (morphemes) are stored in the mental lexicon in **phonemic transcription**
  - What this means: Every speech sound in the word (morpheme) is stored in terms of its mental sound category

5. Phonemes and allophones

- Words (morphemes) are stored in the mental lexicon in **phonemic transcription**

- The phonetic/surface/pronounced forms of words are produced by the **mental grammar**, which applies **phonological rules** as needed
  - When a phoneme has *more than one* allophone, phonological rules determine *which one appears*

  → More about rules in Wednesday's learning activities