**Overview**
- Duality of patterning
- Why phonology?
- Contrast
- Predictability
- The phoneme
- Allophonic variation
- Contextually limited contrast
- Limited distribution
- Well/ill-formedness

**Duality of patterning**
First type of pattern: *meaningful* units are arranged to form larger *meaningful* units. The meaning of the larger unit is a predictable function of the smaller units and their arrangement.

Dog bites man.
Man bites dog.
*Bites dog man.
un-manage-able

Second type of pattern: *meaningless* units are combined to form larger *meaningful* units. Varying the order of the smaller units can change the meaning, but the semantic contribution of the smaller units is not predictable.

\[
[nus] = \text{`noose'}
[sun] = \text{`soon'}
[snu] \text{meaningless}
*[usn] \text{meaningless and ill-formed}
\]

[n] is not associated with any recurrent semantics (exception: phonaesthemes)

It is the “syntax” of these meaningless units that we study in phonology =
- What are the contrastive units?
- Which sequences of units are allowed?
- How are forbidden sequences avoided?
Why does phonology exist?
Words and morphemes obviously need a syntax, because listeners have to calculate a meaning from their arrangement.

Forbidding *Bites dog man (as VP NP NP) simplifies things for English speakers:

(i) fewer patterns to remember—there are only two meanings for \{VP, NP, NP\}, so why not just have two orders.

(ii) helps to disambiguate (*bites can be NP or VP, and so can dog*)

But why bother with syntax for sounds (meaningless units)? [usn] is quite pronounceable, so why forbid it?

Speech as a data-transmission system

Speech is an information-transmission device that is dependent on articulatory and auditory, as well as cognitive, limitations.

The syntax of words caters to our cognitive limitations; the syntax of sounds caters to our articulatory and auditory limitations (and maybe cognitive ones too).

Each language strikes its own balance among articulatory ease, auditory clarity, and rate of information transmission.

Example
With two sounds, /b/ and /a/, we want to create a vocabulary of 14 words (homonyms not allowed).

Language 1: no restrictions on sequence

Language 2: all Cs must be adjacent to a V, no sequences of two Vs in a row
In this class, we'll be looking at what kinds of syntactic restrictions and “transformations” languages impose, and why.

Phonology as a field tries to understand the nature and range of existing “sound syntax” and develop a model of that part of human cognition that governs it.

**Contrast**
Languages have many sounds because it makes large vocabularies possible without excessively long words.

English /p/ versus /b/:
- it’s not that words with /p/ consistently have the semantic feature [X] and words with /b/ have [Y]…
- rather words with /p/ and words with /b/ consistently differ in meaning.

\[ /p/ \text{ and } /b/ \text{ contrast in English, which makes them separate phonemes in English. } \]

English [p] vs. [pʰ]: *minimal pairs?*
Definition: a minimal pair for sounds /X/ and /Y/ is a pair of words that (i) differ in meaning and (ii) differ (morphologically and phonologically) only in that where one word has /X/, the other has /Y/.

Compare Hindi:
- pal ‘take care of’  pʰal ‘edge of knife’  bal ‘hair’

**Predictability**

In Hindi, whether a word will have [p] or [pʰ] is not predictable. (That’s what allows the contrast to carry information).

But in English, the *distribution* of [p] and [pʰ] is quite predictable. They are in *complementary distribution*: there are contexts that allow [p] but not [pʰ]; there are contexts that allow [pʰ] but not [p]; there are no contexts that allow either one.

**The Phoneme**

English speakers seem to group [p] and [pʰ] together into a *phoneme* (symbolic unit).

Evidence:
- we spell them with the same letter
- Monolingual English speakers need special training to hear or produce the difference.
• **alternation**: depending on context, the same slot can get filled in different ways ([p] or [pʰ])

**Alternation and allophonic variation**
In English, [p] and [pʰ] are both *allophones* (concrete pronunciations) of a single phoneme, (abstract slot—let’s call it /p/). When a word is uttered, *rules* choose the correct allophone.

- mental dictionary pronunciation

  
  \[
  /p/ \quad [p] \quad [pʰ]
  \]

**Practice**

*Kenyang*
Niger-Congo language spoken by 65,000 Banyang people in and around Mamfe, Cameroon. Not traditionally written.

- enaq ‘tree’
- eket ‘house’
- nek ‘rope’
- ngaq ‘knife’
- etaq ‘town’
- ajuk ‘(person’s name)’
- enaq ‘drum’
- ntjiku ‘I am buying’
- ekaq ‘leg’
- naq ‘brother-in-law’
- pəbrik ‘work project’
- ndek ‘European’

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1 All background data on languages is from www.ethnologue.com
Sindhi
Indo-European language spoken by 19,675,000 people in Pakistan, India, Singapore. Uses Arabic and Gurumukhi scripts.

pənu  ‘leaf’
vədʒu  ‘opportunity’
ʃəki  ‘suspicious’
gədo  ‘dull’
dəru  ‘door’
pʰənu  ‘snake hood’
təru  ‘bottom’
kʰəto  ‘sour’
bədʒu  ‘run’
bənu  ‘forest’
bəʃu  ‘be safe’
dʒədʒu  ‘judge’
Farsi (Western?)
Indo-European language spoken by 26,523,000 people in Iran, USA, Turkey, Iraq, Saudi Arabia, Germany, United Arab Emirates, Qatar, Bahrain, Uzbekistan, Tajikistan, Oman, Canada, UK, Greece, Denmark, Turkmenistan, Netherlands, Austria, Israel. Uses Arabic script.

æretes  ‘army’
farsi  ‘Persian’
qædri  ‘a little bit’
rah  ‘road’
ris  ‘beard’
ruez  ‘day’
ahař  ‘starch’
behtæř  ‘better’
haertowř  ‘however’
tʃar  ‘four’
tʃedʒur  ‘what kind’
ahari  ‘starched’
bæradæř  ‘brother’
berid  ‘go’
ibiræŋg  ‘pale’
tʃera  ‘why’
darid  ‘you have’
sʃir  ‘lion’
Contextually-limited contrast

Polish

Indo-European language spoken by 44,000,000 people in Poland, USA, Ukraine, Belarus, Lithuania, Canada, Israel, Russia, Kazakhstan, Latvia, Czech Republic, Slovakia, Austria, Hungary, Australia, Romania, Azerbaijan, Finland. Uses Roman script.

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<tr>
<th>singular</th>
<th>plural</th>
<th>gloss</th>
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<tr>
<td>klup</td>
<td>klubi</td>
<td>‘club’</td>
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<td>trup</td>
<td>trupi</td>
<td>‘corpse’</td>
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<td>dom</td>
<td>domi</td>
<td>‘house’</td>
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<td>jumi</td>
<td>‘noise’</td>
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<tr>
<td>buj</td>
<td>boje</td>
<td>‘fight’</td>
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Limited distribution

English η vs. h

Should we consider these allophones of the same phoneme?
What is well-formedness?
Failing to apply the English aspiration rule produces “illegal” sequences.

But what does “illegal” mean?

Preview of next time (Monday, Feb. 11)
- A bit about loanword phonology
- Rules vs. constraints

To do for next time
Read:
- Gussenhoven & Jacobs ch. 2 & 3