HS 133: Introduction to Phonetics

This week:

Monday: Phonemes and Allophones
Tuesday: Suprasegmentals
Friday: Pre mid-term revision

Phonemes and Allophones

Examples from English and Hindi

English		**Hindi**	
Pull	[pʰul]	पल	[pəl]
Spool	[spul]	फल	[pʰəl]
Soup	[sup̚]		

Complementary and **Contrastive** Distribution

Contrastive distribution: Minimal pairs/ sets possible

Allophones in contrastive distribution are separate **phonemes**

Phonemes and allophones

- Basic phonological unit
- Allophones are variations of the phoneme arising due to predictable effects
- One of the allophones, usually most unrestricted one is the representative phoneme

English	
Pull	[pʰul]
Spool	[spul]
Soup	[supˀ]

Korean Example

[mul]	'water’	[pal]	'foot’
[mal]	'horse’	[pari]	'of the foot’
[mulkama]	‘place for water’	[səul]	'Seoul’
[malkama]	'place for horse’	[rupi]	'ruby’
[mure]	'at the water’	[ilkop]	'seven’
[mare]	'at the horse’	[ratio]	'radio'

Hint: syllabification

- Are [l] and [r] contrastive sounds?
- Do they have minimal pairs?
- Which one is more unrestricted?
- Which one is more restricted and why?
- Do you think they are they allophones of the same phoneme?

How to write this predictable rule?

Phonetics vs. Phonology

- Phonology deals with the structure of the speech sounds in a language
- Abstract cognitive system dealing with the rules in the mental grammar
- Phonetics is more about the physical representation of the sounds

Distinctive features

- In 1968 Noam Chomsky and Morris Halle published *Sound Patterns of English* (SPE)
- Proposed binary features for speech sounds.
- Speech sounds are represented as a bunch of binary values.
- Some are very obvious such as [+voice], [-nasal] etc.
- Some are more advanced such as [+continuant], [-sonorant] etc.
- /b/:

$$\begin{bmatrix} +\text{consonantal} \\ -\text{syllabic} \\ -\text{continuant} \\ +\text{labial} \\ +\text{voice} \end{bmatrix}$$

Distinctive features

	p	b	m	f	v	θ	ð	t	d	n	s	z	l	ɾ	ʃ	ʒ	tʃ	dʒ	j	ɹ	k	g	ŋ	w	ʔ	h
Back	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
High	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	-	-
Coronal	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
Anterior	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Labial	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Continuant	-	-	-	+	+	+	+	-	-	-	+	+	+	-	+	+	-	-	+	+	-	-	-	+	-	+
Lateral	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Nasal	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Sonorant	-	-	+	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	+	+	-	-	+	+	-	-
Strident	-	-	-	+	+	-	-	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Voiced	-	+	+	-	+	-	+	-	+	+	-	+	+	+	-	+	-	+	+	+	-	+	+	+	-	-

Table 2. Distinctive Features of American English Vowels

i	ɪ	e	ɛ	æ	u	ʊ	o	ɔ	a	ʌ	ə	
+	+	-	-	-	+	+	-	-	-	-	-	**high**
-	-	-	-	+	-	-	-	-	+	+	-	**low**
-	-	-	-	-	+	+	+	+	+	-	-	**back**
-	-	-	-	-	+	+	+	+	-	-	-	**rounded**
+	-	+	-	-	+	-	+	-	-	-	-	**ATR**

Underlying and Surface forms

- Pronounced words are ‘surface’ forms.
- Abstract ‘underlying’ forms contain feature values.
- ‘Underlying forms’ have phonemes or phonemic in nature
- Phonological rules (grammar) may mediate from underlying to surface forms.
- ‘Generative grammar’:
  - Be parsimonious: make the algorithm as simple and general as possible.
  - Don’t undergenerate: ensure that all of the possible forms of a language are possible outputs of the grammar.
  - Don’t overgenerate: ensure that none of the impossible forms are generated by mistake.

Totonac language is spoken in Mexico. Are voiced and voiceless vowels in Totonac in contrast, in free variation, or in complementary distribution? If the sounds are in complementary distribution, pick one sound as the basic sound and give the phonetic contexts for its allophones.

a.	[tsapsḁ]	‘he stacks’
b.	[tsilinksḁ]	‘it resounded’
c.	[kasitti̥]	‘cut it’
d.	[kuku̥]	‘uncle’
e.	[ɬkakḁ]	‘peppery’
f.	[miki̥]	‘snow’
g.	[snapapḁ]	‘white’
h.	[stapu̥]	‘beans’
i.	[ʃumpi̥]	‘porcupine’
j.	[ta:qhu̥]	‘you plunged’
k.	[tihaʃɬi̥]	‘he rested’
l.	[tukʃɬi̥]	‘it broke’