Week 1, Class 2: Introduction, phonemes

Readings: Hayes (APS reader) Chapter 1 (for review) and Chapter 2
Homework: Homework 1 will be due on Wed. April 4/12 before lecture (there is a typo on the syllabus).

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1. *Phonemicization: body of knowledge and techniques to work out the phonemic system of a language*

- If there are minimal pairs, you are in luck
- Sometimes there are gaps – just because you cannot find a minimal pairs doesn't mean there is not a phonemic distinction.

2. ***Near minimal pairs**: accidental gaps in the vocabulary may make it impossible to find minimal pairs as evidence that two sounds are different phonemes.*

Minimal Pairs (some dialects)

/ð/		/ʒ/	
a. /beð/	*bathe*	d. /beʒ/	*beige*
b. /lɛðɚ/	*leather*	e. /leʒɚ/	*leisure*
c. /sið/	*seethe*	f. /siʒ/	*siege*

Not minimal pairs in all dialects

/ð/		/ʒ/	
a. /beð/	*bathe*	d. /bedʒ/	*beige*
b. /lɛðɚ/	*leather*	e. /liʒɚ/	*leisure*
c. /sið/	*seethe*	f. /sidʒ/	*siege*

Near minimal pairs

/ð/		/ʒ/	
a. /teðɚ/	*tether*	d. /pleʒɚ/	*pleasure*
b. /niðɚ/	*neither*	e. /siʒɚ/	*seizure*
c. /hiðən/	*heathen*	f. /adhiʒən/	*adhesion*

- How do we know that /ð/ and /ʒ/ are phonemes, not allophones of the same phoneme, if there are few/no minimal pairs for many speakers
  - **i.** There is no consistent phonetic environment where each sound appears.
  - **ii.** New words could come into English that exploit the distinction, creating a true minimal pair (e.g. *heathen, hesion*)

3. *Recipe for phonemic analysis*

1. Assemble a fully representative data set, accurately transcribed (this is ideal but sometimes hard to find)
2. Make a phonetic chart of all of the sounds
3. Divide and conquer: concentrate on a few sounds at a time, that are phonetically similar
4.. **Look for minimal pair**s (lack of minimal pairs doesn't mean there is not a phonemic distinction)
5. **Collect local environments of sounds**: determine if sounds are distinctive or in complementary distribution

6. State the environment in the most general way possible (the allophone found in the most environments can be stated as "elsewhere")
7. Set up and underlying form for the allophones (**usually** the "elsewhere" allophone) and write a phonological rule (A→B/P__Q) deriving the other allophones. Write the rules in as general a form as possible, leaving out unnecessary material
8. Test your rule on all forms that have the same environment. Illustrate with derivations
6. Figure out the other phonemes in the language. Where possible, don't just add new rules, but generalize rules you have already written. For example, a rule that aspirates all the voiceless stops is more general that a rule that just aspirates /t/.

4. Hindi:Is aspiration phonemic of phonetic?

Hindi aspirated vs. unaspirated consonant phonemes			
Aspirated		Unaspirated	
a. [pʰal]	*edge of knife*	d. [pal]	*take care of*
b. [tʰan]	*roll of cloth*	e. [tan]	*mode of singing*
c. [kʰan]	*mime*	f. [kan]	*ear*

5. Example: Papago[1] (Uto-Aztecan) : focus - voiced and voiceless dental stops and palatal-alveolar affricates: [t, t͡ʃ, d, d͡ʒ]

1.	[bɨ̌d͡ʒim]	*turn around*	2.	[hɨ̌wgid]	*smell*
3.	[tá:pan]	*split*	4.	[t͡ʃɨ̌haŋ]	*hire*
5.	[hɨ̌doḍ]	*cook*	6.	[tóɲi]	*become hot*
7.	[t͡ʃɨ̌kid]	*vaccinate*	8.	[wɨ̌ḍut]	*swing*
9.	[gátwid]	*shoot*	10.	[tá:taḍ]	*feet*
11.	[t͡ʃuku]	*become black*	12.	[kɨ̌:t͡ʃud]	*build a house for*
13.	[dágʂp]	*press with hand*	14.	[dó:dom]	*copulate*
15.	[tóha]	*become white*	16.	[tá:tam]	*touch*
17.	[d͡ʒú:ki]	*rain*	18.	[d͡ʒɨwid]	*soil, earth*
19.	[wɨ́mt]	*help, marry*	20.	[t͡ʃɨ̌gig]	*name, reputation*
21.	[d͡ʒɨ̌k]	*taste*	22.	[t͡ʃɨ̌:wia]	*settle, establish residence*

6. Vowel system of Papago

	front	central unrounded	back rounded
high	i, iː	ɨ, ɨː	u, uː
mid			o, oː
low		a, aː	

[1] Data and analysis assembled by Bruce Hayes, based on Saxton, Dean, Lucille, Saxton, and Susie Enogs (1983) *Dictionary: Papago/Pima-English, Engslish-Papago/Pima,* University of Arizona Press, Tucson.

7. Consonant system of Papago

		labial	alveolar	palato-alveolar	retroflex	palatal	velar	glottal
stops	voiceless	p	t				k	
	voiced	b	d		ɖ		g	
affricates	voiceless			t͡ʃ				
	voiced			d͡ʒ				
fricatives	voiceless		s		ʂ			h
nasals		m	n			ɲ	ŋ	
liquids			r					
glides		w				j		

8. Sort data by immediate contexts

- Left context only: Is there a pattern?
- Right context only: Is there a pattern?

9. Few data, especially for [dʒ]

- enough data to start to form generalization
- suggests areas where you should look for further data
- once you have found a generalization it needs to be tested with as much data as you can get your hands on.

10. Formalization – write a rule, give it a name, say what your rule does

e.g. x → y / ___ z

- What is the underlying form? [part to the left of →]
- What is the structural change? [part to the right of the →]
- What is the most general statement of the environment? [part after "/"]
- State the rule as simply as possible and leave out what is not needed (ask yourself "will the rule work without it?)
- Give the rule a good name, for easy reference, and say what your rule does in words.

11. Illustrative derivations

- Choice of forms: enough to make the operation of the system clear.
- Underlying forms: This will be the "base" form whose features have not been changed by rules (usually the "elsewhere" allophone)
- Put altered sounds in the appropriate place when a rule applies, and a long hyphen to show that a rule is not applicable