LING20001 — Discussion 2
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Basic steps to working on a phonological data set:

1. If not certain about inventory of phonemes, look for minimal pairs:
   - if you find a minimal pair with phone α and phone β, then α, β phonemes
   - **Example**: [bit] 'beat' and [pit] 'Pete' ⇒ b, p are phonemes — i.e. /b/, /p/
   - **Remark**: you usually can't find minimal pairs for all pairs of sounds, so this is a good first diagnostic, but not a final one.
2. For suspect/uncertain phones, list the environment in which they occur (start with just immediate environment)
   - **Environment schema**:

     previous context ___ following context

     the '___' is a placeholder for the sound of interest
   - **Example**: English 'dark l' vs. 'light l' vs. 'n' — i.e. [ɬ] vs. [l] vs. [n]

     Consider this very small data set:

dɛliz	'delis'	dɛniz	'Denny's'
lɑɪt	'light'	dəlɑɪt	'delight'
nɑɪt	'night'	fɑɬ	'fall'
din	'dean'	diɬ	'deal'

     Contexts:

[n]	[l]	[ɬ]
$[_{word}$ _ ɑɪ	$[_{word}$ _ ɑɪ	ɑ _$]_{word}$
ɛ _ i	ə _ ɑɪ	i _$]_{word}$
i _$]_{word}$	ɛ _ i	
3. Determine which phones are allophones and which are contrastive. You base your selection on the environments: **a** phone with a more predictable/consistent set of environments is one you should *argue* to be an allophone; from the other perspective, **the** phone with the most unpredictable / least consistent environment is **the** one you should argue to be **the** underlying phoneme. Explain how/why the environment is more predictable/consistent.
   - **Example**: [ɬ] is an allophone of [l] because [ɬ] only occurs at the end of words (in this simple dataset), whereas [l] occurs word-initially and intervocalically (between two vowels). The phones [l] and [n] are contrastive because they have the minimal pair *night* and *light* — i.e. the intersection of the set of environments for [l] and the set of environments for [n] is non-empty (it has $[_{word}$ _ ɑɪ).
   - **Remark**: For phones which are in complementary distribution, one is the phoneme and the rest are allophones.

4. State clearly your hypothesis about the phonemic inventory — i.e. summarize what you did in the previous step, making clear what you think the underlying phoneme is and the phoneme's surface allophone(s). Denote the phonemes with / · / and allophones with [·]: these represent, respectively, what you believe is underlying and what you observe (on the surface).

   - **Example**: The underlying phonemes are /l/ and /n/, and [ɬ] is an allophone of /l/.

5. Write a rule to relate predictable to unpredictable — name the rule and use prose to (concisely) describe it. Then, do a derivation on at least one data point for each rule you posit. This means show how your rule takes a candidate underlying form and generates/derives the surface (observed) form; additionally, it is nice to demonstrate where the rule doesn't apply with another appropriate data point.

   - **Mantra**: X becomes Y in the context of Z
   - **Schema**: $X \longrightarrow Y \Big/ Z$
   - **Interpretation**: The underlying form X (phoneme /·/ or set of features) changes to the surface form Y (allophone [·] or set of features) in the context Z
   - **Example**

     Name: /l/ velarization

     Description: /l/ becomes velarized and surfaces as [ɬ] at the end of a word.

     In symbols: $/\text{l}/ \longrightarrow [\text{ɬ}] \Big/ \_\_]_{word}$

     Example derivation:

gloss	underlying form	/l/ Velarization	surface form
'fall'	/fɑl/	fɑɬ	[fɑɬ]
'light'	/lɑɪt/	—	[lɑɪt]

Sudanese Colloquial Arabic

For this problem, identify and describe the alternation in the nouns for 'country' and 'girl'; then, determine each noun's underlying form. Write (a) rule(s) to account for the alternation, using the features given below. The inventory of phonemes is given for reference.

balat fihim	'a country understood'
balat xirib	'a country was ruined'
balat ħaarab	'a country fought'
balad malak	'a country owned'
balad wazzaʕ	'a country distributed'
balad ribiħ	'a country profited'
balad liʕib	'a country played'

bit faahma	'a knowledgeable girl'
bit xaamsa	'fifth girl'
bit ħilwa	'a beautiful girl'
bit laʔiima	'a wicked girl'
bit mardʕaana	'a sick girl'
bit wannaasa	'storyteller girl'

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balas samħa	'a beautiful country'
balaʃ ʃaaf	'a country saw'
balaz ziʕil	'a country got angry'
balad͡ʒ d͡ʒaab	'a country brought'

biz zakiyya	'an intelligent girl'
bid͡ʒ d͡ʒamila	'beautiful girl'
bis samħa	'a beautiful girl'
biʃ ʃeena	'an ugly girl'

Inventory of phonemes for Sudanese Colloquial Arabic

	labial	dental	alveolar	palato-alveolar	palatal	velar	uvular	pharyn-geal	glottal
stop	p		t d tʕ dʕ			k	q		ʔ
nasal	m		n						
fricative	f	θ ð ðʕ	s z sʕ	ʃ			χ ʁ	ħ ʕ	h
trill			r						
affricate				d͡ʒ					
approx.				l/ɬ	j		w		

	Voicing	Manner	Region	Sonorant
b	+voice	plosive	labial	-sonorant
f	-voice	fricative	labial	-sonorant
t	-voice	plosive	coronal	-sonorant
d	+voice	plosive	coronal	-sonorant
s	-voice	fricative	coronal	-sonorant
ʃ	-voice	fricative	coronal	-sonorant
z	+voice	fricative	coronal	-sonorant
d͡ʒ	+voice	affricate	coronal	-sonorant
k	-voice	plosive	back	-sonorant
g	+voice	plosive	back	-sonorant
x	-voice	fricative	back	-sonorant
ɣ	+voice	fricative	back	-sonorant
ħ	-voice	fricative	—	-sonorant
ʕ	+voice	fricative	—	-sonorant
m	+voice	nasal	—	+sonorant
n	+voice	nasal	—	+sonorant
r	+voice	liquid	—	+sonorant
l	+voice	liquid	—	+sonorant
w	+voice	glide	—	+sonorant