Class 9: Structure below the segment II

To do
- ☐ Project: meet with me a second time by the end of this week. Goal is to solidly have a topic by end of this week.
- ☐ I'll post an autosegmentalism homework by end of Friday
- ☐ Next study questions: McCarthy & Prince 1994, but let's delay that till Wed., Feb. 14

Overview: More practice with autosegmental tone, then other autosegments.

1 Something else that autosegmentalism is good for: tonal stability

- *Margi* (Hoffman 1963, via Kenstowicz 1994) aka Marghi Central, Afro-Asiatic language from Nigeria with 158,000 speakers

sál	sál-árì	'man'	-árì/-ărì = definite suffix
kùm	kùm-árì	'meat'	
ʔímí	ʔímj-árì	'water'	
kú	kw-árì	'goat'	
tágú	tágw-árì	'horse'	
tì	tj-ărì	'morning'	
hù	hw-ărì	'grave'	
úʔù	úʔw-ărì	'fire'	

? What's the underlying form of the suffix?

? How could we describe the tonal alternation in rules?

? What about with constraints—what's the problem with using IDENT(tone)?

- If we really are treating tones not as features (properties of segments) but as segments, then...
  - they have correspondence indices (that we sometimes write, sometimes don't write)
  - it makes sense to have the MAX and DEP constraints refer to them:

/hu + ari/ L_1 H_2L_3	ONSET	IDENT(syll)	MAX-Tone
a hu . ari | | | L_1 H_2 L_3	*!		
☞ *b* hwari /\ \ $L_1H_2L_3$		*	
c hwari | | H_2 L_3		*	*!

2 Sweater vs. eye color example (I'll explain)

3 Something else autosegmental representations are good for: floating tones

Igbo (Goldsmith 1976; Niger-Congo; 17,000,000 speakers; Nigeria)

- Subordinate clauses are preceded by a complementizer morpheme that is nothing but a H tone:

ọ̀nụ̀	'yam'	ọ̀nū [rèré èré]	'the yam [that is rotten]'
ázụ̀	'fish'	ázū [rèré èré]	'the fish [that is rotten]'
ánú	'meat'	ánú [rèré èré]	'the meat [that is rotten]'
àkwhá	'eggs'	àkwhá [rèré èré]	'the eggs [that are rotten]'

? Fill in the tableau (gives you an idea of some typical OT autosegmental constraints)

/ az̃ụ + + rere + ere/ H_1 L_2 H_3 L_4 H_5 L_6 H_7	NO UNATTACHED TONES	DEP-V	MAX-TONE	*>1TONE PERTBU	IDENT(tone)/ first syll of word	UNIFORMITY-TONE
a a z̃ ụ r e r e e r e | | | | | | | H_1 L_2 H_3 L_4 H_5 L_6 H_7						
b a z̃ ụ r e r e e r e | | \ | | | | H_1 L_2 H_3 L_4 H_5 L_6 H_7						
☞ *c* a z̃ ụ r e r e e r e | | | | | | | H_1 $M_{2,3}$ L_4 H_5 L_6 H_7						
d a z̃ ụ r e r e e r e | | | | | | H_1 L_2 $M_{3,4}$ H_5 L_6 H_7						
e a z̃ ụ a r e r e e r e | | | | | | | H_1 L_2 H_3 L_4 H_5 L_6 H_7						
f a z̃ ụ r e r e e r e | | | | | | H_1 L_2 L_4 H_5 L_6 H_7						

[What prefers $M_{2,3}$ over $H_{2,3}$ or $L_{2,3}$? Maybe we do need tonal features after all....]

4 Tones behaving as a block

- *Shona* (Odden 1980), via Kenstowicz; Niger-Congo; 7,000,000 speakers; Zimbabwe and Zambia)

? Fill in a possible autosegmental tone representation under each example

mbwá	'dog'	né-mbwà	'with dog'
hóvé	'fish'	né-hòvè	'with fish'
mbúndúdzí	'army worm'	né-mbùndùdzì	'with army worm'
hákátà	'diviner's bones'	né-hàkàtà	'with diviner's bones'
bénzíbvùnzá	'inquisitive fool'	né-bènzìbvùnzá	'with inquisitive fool'

⇒ sequences of the same tone undergo a rule together, <u>as though they were a single tone</u>.

- Let's assume there is some reason why H → L after né-, and consider only outputs that do so:

? Why [né-hòvè] and not *[né-hòvé]? What must be the surface representation of [hóvé]?

? Why [né-bènzìbvùnzá] and not *[né-bènzìbvùnzà]?

? Richness of the base: what if there were an input like $/\overset{\text{hove}}{\text{H H}}/$?

- The OCP (Obligatory Contour Principle) constraint says that adjacent identical elements (such as two Hs in a row) are not permitted. Does this help with the Richness of the Base question?

? We'll still have a puzzle if we add né- to hypothetical /hove / ... Will strata help?
H H

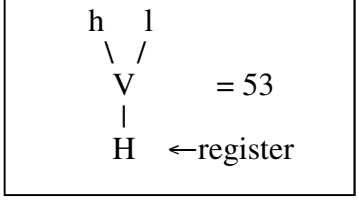
5 What about East-Asian-type tone? (examples taken from Kenstowicz 1994, ch. 7)

- Seems to be different from African-type[1] tone:
  - often more than three levels (5 is typical)
  - often transcribed with Chao numbers (Chao 1930): [ma^{213}] means tone starts lowish (2), then dips to the bottom of the range (1) then goes up to the middle (3)
  - contour tones often behave as a unit rather than combination of H&L

- Various proposals—here's a simple one (Yip 1989): add another tier with features [hi register] and [lo register].

register	*tone (aka "contour")*	*resulting pitch*
[+hi register, –lo register] (H register)	h	5
	m	4
	l	3
[–hi register, +lo register] (L register)	h	3
	m	2
	l	1

example



- Allows the register of an entire contour to change by just changing one feature, e.g. 53 → 31

- What is register, articulatorily?
  - It's been proposed to correspond to stiff vs. slack vocal folds.
    - But often this is true only in the language's history & not synchronically.
  - Can be associated with a voice quality difference, e.g. L register is breathy
- How do you know whether a 3 is H & l or L & h?
  - Normally the whole syllable has the same register tone. So if you see 53, 34, etc., it must be H; if you see 13, 32, etc., it must be L.
- But what if it's just 3 or 33?
  - You will have to use other facts about the language to deduce the right representation.

[1] Of course these labels are very approximate, and there are many other regions of the world with lots of tone languages.
[4] Problematic for Mandarin 3rd tone, commonly claimed to be 214. See, e.g. Zhang & Lai 2006 for a 213 transcription.

6 Example: distribution of tones in Songjiang

(Bao 1990, via Kenstowicz 1994; apparently a Shanghai-area dialect of Wu Chinese [Sino-Tibetan; China; 77 million speakers] example words from Chen 2000)

voiced onset, unchecked syll.	voiced onset, checked syll.	voiceless onset, unchecked syll.	voiceless onset, checked syll.
22 di^{22} 'younger brother'	**3** baʔ^{3} 'white'	**44** ti^{44} 'bottom'	**5** paʔ^{5} 'hundred'
31 di^{31} 'lift'		**53** ti^{53} 'low'	
13 di^{13} 'field'		**35** ti^{35} 'emperor'	

"checked" syllable = syllable that ends in a glottal stop

? Draw the representation of each tone.

? What markedness constraints can we develop to explain the inventory?

7 Turning to non-tone features... a morpheme that has no consonant or vowel: Japanese

- Rendaku ('sequential voicing') happens in compounds (data from Ito & Mester 2003) [2]

eda + ke	→	eda-ge	'split hair' (branch+hair)
unari + koe	→	unari-goe	'groan' (groan+voice)
me+tama	→	me-dama	'eyeball' (eye+ball)
mizu + seme	→	mizu-zeme	'water torture' (water+torture)
ori+kami	→	ori-gami	'origami' (weave+paper)
neko+ɕita	→	neko-d͡ʑita	'aversion to hot food' (cat+tongue)

? Ideas for what the compound-forming morpheme could be?

[2] If you're curious how a system like this came about, it's been argued that historically, the genitive-like particle [no] ''s' occurred in the middle of most compounds (eda+no+ke 'branch's hair'). Then, the vowel deleted in most cases (eda+n+ke) and the *n* merged with the following consonant, which became voiced (for the same reason that, as you read in Kager ch. 2, many languages don't allow a sequence of *nasal+voiceless*, many languages also dissallow voiceless prenasalized voiceless obstruents): [eda-^{n}ge]. Later, the prenasalization was lost.

? Unresolved issue to discuss: What faithfulness constraint(s) does [eda-ge] violate?

8 A feature that moves from one segment to another: Tyneside English (Newcastle, England; via Kenstowicz 1994)

		assume
skɐmʔi	'scampi'	/skɐnpi/
ɐnʔi	'aunty'	/ɐnti/
hɐŋʔi	'hanky'	/hɐnki/
hɐʔm̩	'happen'	/hɐpn/
bɐʔn̩	'button'	/bɐtn/
tʃɪʔŋ	'chicken'	/tʃɪkn/

? First, analyze this with two (non-autosegmental) rules: place assimilation and place loss.

? In OT, we can avoid the question of rule ordering if we let [place] be autosegmental. Give it a try...(I've left room under the candidates to draw in a [place] tier)

/tʃɪkn/	
☞ *a* tʃɪʔŋ̩	
b tʃɪʔn̩	
c tʃɪkn̩	
d tʃɪkŋ̩	

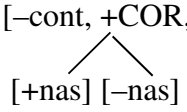
9 A feature associated to multiple segments: nasal harmony

Paraguayan Guaraní (Tupí language from Paraguay with 4,850,000 speakers). Data taken from Beckman 1999, originally from Lunt 1973, Rivas 1975.

- Nasality is contrastive, but not freely distributed:[3]

t̃ũˈp̃ã	'god'	tuˈpa	'bed'	*tuˈpã
p̃ĩˈr̃ĩ	'to shiver'	piˈri	'rush'	*piˈrĩ
mãˈʔẽ	'to see'	ᵐbaˈʔe	'thing'	*ᵐbaˈʔẽ, *ᵐbãˈʔẽ, *maˈʔe
h̃ũˈʔũ	'to be bland'	huˈʔu	'cough'	*huˈʔũ
ãˈkɨ̃	'to be tender'	aˈkɨ	'to be wet'	*aˈkɨ̃
p̃õˈt̃ĩ	'to be done for'	poˈti	'to be clean'	*poˈtĩ

Aside: How do we represent prenasalized stops like [ⁿd]? Just like a contour tone!



This explains why the segment behaves as [+nasal] on the left side and [–nas] on the right side.

? Warm up by drawing autosegmental representations for some of these surface forms. Assume that if more than one segment in a row is [+nasal], they share the same [+nasal] feature.

? How do you explain the alternations in the prefixes?

nõ-r̃õ-nũˈp̃ã-i[4]	'I don't beat you'
not-I.you-beat-*negation*	
nõ-r̃õ-h̃ẽˈⁿdu-i	'I don't hear you'
not-I.you-hear-*negation*	
ⁿdo-ro-haɨˈhu-i	'I don't love you'
not-I.you-love-*negation*	
r̃õ-ᵐbo-ɣwaˈta	'I made you walk'
I.you-*causative*-walk	
r̃õ-mõ-p̃õˈr̃ã	'I embellished you'
I.you-*causative*-nice	
r̃õ-mõ-x̃ẽˈⁿdu	'I made you hear'
I.you-*causative*-hear	

⇒ The feature [nasal] seems to be behaving autosegmentally too.

[3] Phonetics puzzler: What's the articulatory difference between [p] and [p̃]? What's the acoustic difference? Walker 1999 argues based on acoustic and nasal-airflow data that voiceless stops don't actually get articulatorily nasalized in Guarani. So the real analysis will be more complicated...

[4] Actually, this last [i] is nasalized, but the nasality of final vowels is complicated and controversial in Guaraní so let's pretend it's not—see Beckman's book on positional faithfulness for more.

10 More about Guaraní, if we have extra time

- Compare these data to what we saw above:

ũˈmĩ-ʃa-ˈɣwa	‘like those’
re-ˈxo-ɾ̃ã-ɾ̃ãˈmõ	‘if you go’
ã-nẽ-ɾ̃ẽˈⁿdu	‘I hear myself’
ᵐbaˈʔeᵐbɨaˈʃɨ	‘sadness’

- Why doesn’t spreading go all the way in these cases? Hint: in addition to IDENT(nas), let’s have a special IDENT(nas) constraint for a particular environment.

- Beckman has argued that we do need a special faithfulness constraints and not a special markedness constraint (e.g., “*[+nasal] unless associated to a stressed syllable” vs. general *[+nasal]). Can you see how ‘if you go’ supports her claim?

- Words like *[mãˈʔe] do not occur. Does our analysis so far explain this fact (and if not, how can we fix it)?

11 If yet more time, exercise: Tibetan compounds

- Data from Meredith (1990). (I am simplifying some of the tones!! For instance, 3 is really 2. Sorry for missing data; Meredith often doesn't give concrete examples, just schematics)

? Draw representations for tones 5, 53, 31 (there's also 3 but worry about that later)

? Look at the data and develop an analysis of the tone changes that occur in compounds
  - ? You'll need to invent a constraint on tones in non-word-final syllables
  - ? You'll need to invent a quite arbitrary constraint on tones in the second member of a compound.

1st member	*2nd member*	*compound*	
5	5	5-5	
53	5	**5**-5	
yum 3	chẽẽ 5	yum-chẽẽ 3-5	'mother-*hon.*' (mother+great)
31	5	**3**-5	
5	53	5-53	
thuu 53	caa 53	thuu-caa 5-53	'iron banner fixture' (banner+iron)
3	53	3-53	
31	53	**3**-53	
5	3	5-**5**	
see 53	yöö 3	see-yöö **5**-**5**	'intellectual' (knowledge+possessor)
phöö 3	mi 3	phöö-mi 3-**5**	'Tibetan' (Tibet+person)
ree 31	see 3	ree-see **3**-**5**	'cotton robe' (cotton+robe)
cu 5	kɛɛ 31	co-pkɛɛ 5-**53**	'eighteen' (eight+ten)
53	31	**5**-**53**	
3	31	3-**53**	
31	31	**3**-**53**	

To sum up

- Many features seem to behave not as properties of segments but an entities in their own right.
- This can be captured by autosegmental representations (and, in OT, including autosegments in correspondence relations).

Next week

- We allow ourselves to get one day behind the syllabus by continuing structure below the segment/downward interfaces
- Relation to phonetics: locality, gestural scores, feature geometry, excrescent vowels, illusory deletion...

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