Class 8: Issues in process application: multiple targets, directionality, iterativity

To do
- Project: We'll see some good project topics today and Thursday, so keep looking around

Overview: ways processes can interact with each other (leftovers from last time) and themselves.

1. Before we get to today's topic: we need to look at #4 and #5 from last time

2. On to this week's main topic: Multiple application

- What to do with a form that, for some rule A → B / X__Y or constraint *XAY, contains multiple instances of *XAY*
  - either because *XAY* straightforwardly occurs twice in the form...
  - or because there are multiple ways of interpreting *XAY* (say, in a rule schema).
- And, what if the output of the rule creates or destroys instances of *XAY*?

There's a whole can of worms here that's only barely been re-opened in the OT era.
Great secondary sources for term-paper topics, which I also relied on to get many of this handout's examples: **Howard 1972, Johnson 1970**, and **Anderson 1974**. Stay away from the stress cases, though, since their rule-application issues tend to go away under metrical stress theory. **Vago & Battistella 1982**, **Battistella 1979, Jensen & Stong-Jensen 1973**, **Jensen 1973, Vago 1992** could be good places to find a topic too.

3. Multiple matches: a simple case

- SPE p. 344: "To apply a rule, the entire string is first scanned for segments that satisfy the environmental constraints of the rule. After all such segments have been identified in the string, the changes required by the rule are applied simultaneously."

Example: Palauan again (Austronesian language from Palau (Micronesia) with about 25,000 speakers. Data from Josephs 1990.). Recall vowel reduction:

X	*his/her/its X*	
ɾákt	ɾəkt-él	'sickness'
sésəb	səsəb-él	'fire'
bótk	bətk-él	'operation'
ɾíŋəl	ɾəŋəl-él	'pain'

○ How should your rules apply to an underlying representation like /ðilobaʔ + ɛli/ 'his injury'? (real outcome is [ðələbəʔél])

- Let's sketch an OT analysis—any problems?

4. Eastern Ojibwa glide formation: self-bleeding

(Algonquian language of Canada with about 25,000 speakers [Lewis 2009]. Taken from Johnson/Howard [see there for a complication], originally from Bloomfield 1956—but see Miner 1979 for a criticism of similar data in Menominee)

- $\left\{\begin{matrix} o \rightarrow w \\ i \rightarrow \text{"y"} \end{matrix}\right\}$ / __ V : what will happen to?

- What could happen to /eninioak/? (Correct surface form is [eniniwak].)

5. Klamath (self-bleeding)

(Penutian language of Oregon, very endangered [Lewis 2009]. Data and description taken from Kisseberth 1972; originally from Barker 1963)

glottalized stops:	p̓ t̓ č̓ k̓ q̓
glottalized sonorants:	m̓ n̓ y̓ w̓ l̓
regular sonorants:	m n w y l
voiceless sonorants:	M N W Y L

Deglottalization rules, informally:

glottalized stop → deglottalized / __C-other-than{m,n,w,y,l}
other glottalized → deglottalized / __C

q̓→q / _n̓	nčo**q̓**-a	'is deaf'	nčo**q**-n̓apg-a	'is almost deaf'
p̓→p / _t̓	**p̓**et̓-a	'a hole enlarges'	p̓e-**p**t̓-a	'dist. holes tear out'
t̓→t / _k̓	m-p̓e**t̓**-a	'enlarges hole'	m-p̓e**t**-k̓y-o:l-a	'chips open a hole'
q̓→q / _č̓	**q̓**oč̓-a	'bends'	q̓o-**q**č̓-a	'dist. bend'
p̓→p / _W	nt̓o**p̓**-a	'rots, spoils'	nt̓o**p**-Wi:y-a	'almost rotted'
p̓↛p / _y			nt̓o**p̓**-ye:g-a	'starts to spoil'
t̓↛t / _w			wLe**t̓**-wal	'lies spread eagled on top of'
	cf.		wLe**t**-pga	'is lying flat on back'
n̓→n / _k̓	**n̓**o-k̓a	'little head'	n̓o-**n**-k̓a	'dist. little heads'
w̓→w / _č̓	**w̓**ič̓-a	'is breathless'	wi-**w**č̓-a	'dist. are breathless'
y̓→y / _G[1]	ʔ-iw**y̓**aq	'put in pl. obj.'	ʔi-ʔo:**y**Ga	'dist. put pl. obj. into'
l̓→l / _l	k-bo**l̓**-a	'hits in stomach'	w-bo**l**-lG-a	'falls on stomach'
w̓→w / _l	ga**w̓**al	'finds'	ga**w**l-i:ya	'finds for someone'

- Can we collapse this into a single rule schema?

- How do we expect the schema to apply to these sequences: q̓l̓q, p̓l̓q?

[1] Kisseberth has *g* with a dot below, but dot won't show under the *g* in my font.

Here are the data:	/q̊laq/:	nčo**q-l̊aq**-Wi:y-a	'ears are stopped up'
		nčo**q̊-lɢ**-a	'ears are almost stopped up'
		hos-ta**q-l̊aq**	'make him stop!'
		hos-ta**q̊-lɢ**-a	'makes someone stop an action'
		to**q̊-lɢ**-a	'stops an action'
	/p̊laq/:	sno-nt̊a**p-l̊aq**-s	'rotted wokas[2]'
		sno-nt̊a**p̊-lɢ**-a	'causes to rot down'

- How about an OT analysis? Can we easily rule out *q̊lq → qlq?

6. Southern Kikuyu (self-counterbleeding)

(Gikuyu/Kikuyu is a Niger-Congo language of Kenya with 7.2 million speakers; datum from Johnson 1970, originally from Bennett 1967)

$$k \rightarrow ɣ \; / \; \_\_V_0[\text{voiceless stop}]$$

- What should happen to /ne**k**a**k**aakeroma/ 'he will bite him' in SPE? OT?

Here's the datum: [ne**ɣ**a**ɣ**aakeroma] (*[ne**k**a**ɣ**aakeroma]) [Is it reduplicated, though?]

[2] some kind of aquatic plant gathered for food

7. Tshiluba (self-feeding)

(Lua-Kasai/Tshiluba is a Niger-Congo language of D.R. of Congo with 6.3 million speakers; original consultant work from Johnson 1970)

l → n / [+nasal] V_0 __

u-kwač-i**l**e	'he took'	u-d^{y}im-i**n**e	'he cultivated
ku-kwač-i**l**-a	'to take (ben.)'	ku-d^{y}im-i**n**-a	'to cultivate (ben.)'
u-kwač-i**d^{y}**-i**l**e	'he took (ben.)'	u-d^{y}im-i**n^{y}**-i**n**e	'he cultivated (ben.)'
(l→d^{y}/__i)			

- In an OT analysis, can we easily rule out *u-d^{y}im-i**n^{y}**-i**l**e? *u-d^{y}im-i**l^{y}**-i**l**e?

8. Self-counterfeeding?

- Howard 1972 presents some possible cases but reanalyzes them.
- Kaplan 2008, as you read, reanalyzes many purported cases of self-counterfeeding.

Kavitskaya & Staroverov 2010 present a case from Tundra Nenets (Nenets is a Uralic language of Siberia and Arctic Russia with 31,300 speakers):

- /ʌ/ deletes in even-numbered syllables (from left edge) and final syllable,
  - subject to consonant-cluster constraints—roughly, no complex onsets, and complex codas must have falling sonority

/xʌr**ʌ**/	→ xʌr	'knife-*nom.sg.abs.*'	
/xʌr**ʌ**-r**ʌ**/	→ xʌ.rʌ-r	'knife-*2sg.poss*'	I assume [rr] is a bad coda.
/xʌr**ʌ**-ta/	→ xʌr.-da	'knife-*3sg.poss*'	
/xar**ʌ**t**ʌ**/	→ xa.rʌd	'house-*nom.sg.abs.*'	[see below]
/xar**ʌ**tʌ-r**ʌ**/	→ xar.dʌ-r	'house-*2sg.poss*'	
/xar**ʌ**tʌ-ta/	→ xar.dʌ.-da	'house-*3sg.poss*'	

/nult**ʌ**nʌ-s^{j}**ʌ**/ → nult.nʌ-s^{j} 'house-*3sg.poss*'

But note that surface forms do have [ʌ]s in even-numbered and final syllables:

/xar**ʌ**tʌ-ta/ → xar.dʌ.-da ; xar.d**ʌ**.-da ↛ xard.da (though *rdd* is apparently legal)

- Can we capture this with rules? OT?

- Consider /xarʌtʌ/ → xa.rʌd, *xard. Can our SPE analysis capture this? It's not just plain self-counterfeeding.

- K&S make the generalization that two /ʌ/s never delete in a row. Does that help?

[K&S's analysis involves OT machinery we won't have a chance to cover in this course, Candidate Chains (McCarthy 2007)..]

9. Self-counterfeeding again: morphological truncation

- In Lardil (which you read about in Prince & Smolensky 1993, based on Hale 1973), /pulumunitami/ → pulumunitam (FREE-V) → [pulumunita] (CODACOND)
  - but this doesn't cause any further deletion
  - See Round 2011, though—there's more it

- Tohono O'odham (variety of O'odham, Uto-Aztecan language from Arizona and Sonora with about 9,600 speakers; Lewis 2009). Data here are from Fitzgerald 2002:

imperfective	*perfective*	
mɨḍ	mɨː	'running'
ǰúɲ	ǰúː	'being a certain time of day or night'
hím	híː	'walking'
húg	húː	'eating object'
nóɗ	nóː	'bending object'
ɲɨɲ	ɲɨː	'waking up'
wúḍ	wúː	'tying object with rope'
ṣíːsp	ṣíːs	'pinning'
híkčk	híkč	'cutting'
bídṣp	bídṣ	'painting object'
híhim	híhi	'walking (pl)'
híhink	híhin	'barking (pl)'
ɲíŋok	ɲíŋo	'speaking (pl)'

- Let's compare basic SPE and OT analyses.

- Wolf 2011 discusses a similar example from Chemehuevi (also Uto-Aztecan) and cites (p. 106) several more truncation cases that would make good **term paper topics** (where not already reanalyzed by Kaplan): Catalan, Hidatsa, Karok, Latvian, Lithuanian, Odawa, Ponapean, Woleaian.

10. Interim conclusions

As we'd expect, OT has trouble handling self-counterbleeding and self-counterfeeding, and predicts self-feeding and self-bleeding straightforwardly.

- But what about rule theories? It's not as simply as choosing two different order for rules. What additional flexibility could we give the rule theory to allow all four types of self-interaction?

11. Possible solution: directional application

Left-to-right: Scan the string for the leftmost eligible segment and apply the rule to it. Then scan the resulting form for the leftmost eligible segment, etc.

Right-to-left: Same thing but start with the rightmost eligible segment.

- Let's see which of today's cases this gets right

12. If extra time: directionality in Tianjin tone sandhi

A northern dialect of Mandarin. (Milliken et al. 1997, Chen 2000; see also Kuang 2008)

the tones	tone A	21 or 11	L	[descriptions disagree]
	tone B	45 or 55	H	
	tone C	13, 213,or 24	LH	
	tone D	53	HL	

basic rules

AA → CA	bing^{L} gao^{L}	→ bing^{LH} gao^{L}	'ice cream'
CC → BC	shui^{LH} guo^{LH}	→ shui^{H} guo^{LH}	'fruit'
DD → AD	si^{HL} lu^{HL}	→ si^{L} lu^{HL}	'bus route #4'
DA → BA	da^{HL} jie^{L}	→ da^{H} jie^{L}	'street'

Why *these* rules? Who knows! Tone sandhi tends to be pretty arbitrary synchronically. See Mortensen 2006 for a framework in which to analyze tone sandhi.

- You see the problem: what about /AAA/? /DDD/? /DDA/? /CCC/? /CAA/? /ADD/? /DAA/?

For /DDD/ it depends on the syntactic structure (say Milliken et al.; Chen says always BAD):

[[su^{HL} liao^{HL}] bu^{HL}] → AAD (L.L.HL) 'plastic cloth' (how to prevent *CAD?)
[shang^{HL} [yi^{HL} yuan^{HL}]] → DAD (HL.L.HL) 'House of Lords' (*BAD?)

/AAA/: [[Xi^{L} guan^{L}] Jie^{L}] → ACA (L.LH.L) 'Xiguan Street', not *CCA or *BCA
[kai^{L} [fei^{L}ji^{L}]] → ACA (L.LH.L) 'fly an airplane'

/DDA/: [[si^{HL}ji^{HL}] qing^{L}] → ABA (L.H.L) 'evergreen'
[zuo^{HL} [dian^{HL} che^{L}]] → ABA (L.H.L), not *DBA 'take a tram'

and for the rest, schematically....

/CCC/	→	BBC (LH.LH.LH → H.H.LH)
/CAA/	→	BCA (LH.L.L → H.LH.L)
/ADD/	→	CAD (L.HL.HL → LH.L.HL)
/DAA/	→	DCA (HL.L.L → HL.LH.L)

We'll leave some of this as a paradox—there's an extensive literature you can check out, though.

Next time: Application issues with optional processes.

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