Class 7: Optimality Theory, part II

To do
- Finish beginning-OT assignment (due Tuesday)
- K&K chapter 8 study questions (due Tuesday—will be posted soon)

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1. **Let's warm up with a problem: English regular plurals**

pi-z	'peas'	bloʊk-s	'blokes'
tʰoʊ-z	'toes'	kʰɑf-s	'coughs'
dɑl-z	'dolls'	glɑs-ɨz	'glasses'
pʰæn-z	'pans'	fɪz-ɨz	'fizzes'
dɑg-z	'dogs'	bɹæntʃ-ɨz	'branches'
læb-z	'labs'	bædʒ-ɨz	'badges'
kʰɪln-z	'kilns'	wɪʃ-ɨz	'wishes'
kʰlæsp-s	'clasps'	gəɹɑʒ-ɨz	'garages'
mɪt-s	'mitts'		

2. **Contrast this with Malagasy—what difficulties do we run in to?**

unaffixed noun or adj.	passive imperative	active imperative	passive1	passive2	gloss of root
badíaka	badiáhu	badiáha	badiáhana	badiáhina	badly done
áluka	alúfi	alúfa	alúfana		shelter
véluna	velúmi	velúma	velúmana	velúmina	alive
búruna	burúni	burúna	burúnana	burúnina	tapped out
búhitʳa	buhíru	buhíra	buhírana	buhírina	convex
púritʳa	purítu	puríta	purítana	purítina	cramped

(see Assignment #1 for various caveats—data from Richardson 1885[1])

We won't solve this problem today—when we get to Lexical Phonology, I'll tell you about Dan Albro's OT solution from his dissertation.

3. **Here's one we *can* solve: Catalan** (from Mascaró)

bint	'twenty'
pans	'breads'
bim pans	'twenty breads'

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[1] Richardson, J. (1885). *A New Malagasy-English Dictionary*. Antananarivo: London Missionary Society.

4. And one we can't, at least not with our faithfulness constraints so far: Lena metaphony

(from last assignment—data taken from Walker[2])

fía	'daughter'	fíu	'son'
néna	'child (fem.)'	nínu	'child (masc.)'
tsóba	'wolf (fem.)'	tsúbu	'wolf (masc.)'
gáta	'cat (fem.)'	gétu	'cat (masc.)'

But I think we can come up with something not too crazy by playing with our faithfulness constraints.

5. Opacity

So here we have our first big empirical difference between SPE and OT: SPE straightforwardly predicts opaque interactions, and OT doesn't.

Later on we'll talk about one version of OT that does better with opacity (Kiparsky's Stratal OT), and you'll probably learn lots of other approaches in 201.

So here is one way to find a **term-paper topic**: find an article or book that discusses a case of counterfeeding or counterbleeding. Track down the original data source, and see if the case holds up. If so, does Stratal OT handle it? For an example of an investigation along these lines, see Nathan Sanders's dissertation (he is easy to Google)—of course your papers will be much shorter.

6. Process vs. target

There is also a difference between SPE and OT in typological predictions. While SPE might predict that similar rules should be seen across languages, OT definitely predicts that a given markedness constraint should trigger diverse repairs across languages.

Some terms, coined by McCarthy, that you might run into:

Homogeneity of target
        = languages strive for the same well-formedness conditions on outputs
Heterogeneity of process
        = languages use different means to satisfy the well-formedness conditions

7. Case study: *NÇ̥ (based on two papers by Pater[3])

*NÇ̥ is an abbreviation for *[+NASAL][−VOICE]. This constraint seems to have an aerodynamic basis (raising the velum after a nasal → velar leak and 'velar pumping' → prolongation of voicing)—see Hayes & Stivers.[4]

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[2] Walker, Rachel (2005). Weak triggers in vowel harmony. *Natural Language and Linguistic Theory* 23.

[3] Pater, Joe. 2001. Austronesian nasal substitution revisited: what's wrong with *NÇ̥ (and what's not). In *Segmental phonology in Optimality Theory: Constraints and Representations*, ed. Linda Lombardi, 159-182. Cambridge University Press.

Pater, Joe. 2003. Balantak metathesis and theories of possible repair. Ms., University of Massachusetts, Amherst.

o   What ways can you think of to "repair" a sequence like *ampa*?

o   Let's figure out the ranking for each of the following examples.

- Japanese

present	*past*	*gloss*
ka͡ts-u	kat-ta	'write'
kas-u	kat-ta	
wak-u	wai-ta	
ne-ru	ne-ta	
mi-ru	mi-ta	'look'
ʃin-u	ʃin-da	'die'
jom-u	jon-da	'drink'

- "Puyo Pongo" Quichua

ʃi**ŋk**i	'soot'	tʃu**nt**ina	'to stir the fire'
tʃu**ŋg**a	'ten'	i**nd**i	'sun'
pa**mp**alʲina	'skirt'	ɲuka**ntʃ**i	'we'
ha**mb**i	'poison'	pu**ndʒ**a	'day'
wasi-ta	'house'	kan-da	'you'
ajtʃa-ta	'meat'	atan-da	'the frog'
puru-ta	'gourd'	wakin-da	'others'
ali-tʃu	'is it good?'	kan-dʒu	'you?'
lumu-tʃu	'manioc?'	tijan-dʒu	'is there?'
mana-tʃu	'isn't it?'	tʃarin-dʒu	'does he have?'

- Magindanaw (Austronesian, 1,000,000 speakers in the Philippines)

pəm-báŋun	'is waking up'
pən-dila	'is licking'
pəŋ-gəbá	'is destroying'
pəb-pása	'is selling'
pəd-sígup	'is smoking'
pəd-tánda	'is marking'
pəg-kúpya	'is wearing a kupia'

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[4] Hayes, Bruce and Tanya Stivers. 2000. Postnasal voicing. Ms., UCLA.

- Standard Malay

/məN+pilih/	məmilih	'to choose'
/məN+tulis/	mənulis	'to write'
/məN+kasih/	məŋasih	'to give'
/məN+bəli/	məmbəli	'to buy'
/məN+dapat/	məndapat	'to get, to receive'
/məN+ganti/	məŋganti	'to change'

    note also in Malay

	əmpat	'four'
	untuk	'for'
	muŋkin	'possible'

- Kelantan dialect of Malay—I haven't been able to track down the real data, but it should look
  <u>schematically</u> like this:

/məN+pilih/	məpilih	'to choose'
/məN+tulis/	mətulis	'to write'
/məN+kasih/	məkasih	'to give'
/məN+bəli/	məmbəli	'to buy'
/məN+dapat/	məndapat	'to get, to receive'
/məN+ganti/	məŋganti	'to change'

o How can we explain why it's always the nasal that deletes (not the following C)?

- English

ɪmpʰasəbəl̩	'impossible'
ɪntʰɛmpəɹət	'intemperate'
ɪŋkʰælkjələbl̩	'incalculable'
ɪmbəlɪk	'imbellic'
ɪndisənt	'indecent'
ɪŋgloɹiəs	'inglorious'

Some apparently unattested "solutions":

- Epenthesis /np/ → [nəp]
- Devoice the nasal /np/ → [m̥p][5]

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[5] If *NC̥ is really a constraint against the extra articulatory effort of spreading the vocal folds to prevent voicing, then a devoiced nasal is an even worse violation of that same constraint, so it makes sense that this is unattested.

8.   Language-internal example of heterogeneity of process

Kwanyama (a.k.a. OshiKwanyama; Niger-Congo language with 421,000 speakers in Angola, and an unknown number in Namibia—again from Pater)

Loans:	sitamba	'stamp'
	pelenda	'print'
	oinga	'ink'

Prefixes:	/eːN+pati/	eːmati	'ribs'
	/oN+pote/	omote	'good-for-nothing'
	/oN+tana/	onana	'calf'

o What's the ranking? Let's do some tableaux.

9. The bare bones of correspondence theory (we'll flip forward to this as soon as we need it in our analyses)

In Prince & Smolensky 1993, which you just read part of, an output candidate contains all the information about the input candidate—you can see what's been inserted or deleted. This is retrospectively known as the containment approach (output *contains* the input). This gets a bit tricky for changing features, and much harder for, e.g., metathesis.

McCarthy & Prince 1995[6] proposed replacing containment with *correspondence*, and this is the approach almost everyone uses now.

- Every segment in the input is given a unique index (and perhaps every unit of structure, including features, moras, syllables…), usually written as a subscript Arabic numeral.

- The relation of *correspondence* between input and output segments is encoded by identical indices (subscripted numbers).

	/$t_1u_2i_3$/	IDENT(round)	IDENT(back)
a	[t_1y_2]		*
b	[t_1y_3]	*	

/$p_1a_2t_3o_4k_5$/ → [$p_1a_2t_3o_4k_5$] means that Corr(/p_1/, [p_1]), Corr(/a_2/, [a_2]), etc., where Corr(x, y) means that x corresponds to y.

These are also output candidates for that input: [$p_5a_1t_4o_2k_3$], [$p_1a_1t_1o_1k_1$], [$p_6a_7t_8o_9k_{10}$]
but they're so outrageously bad that we don't usually bother including them in a tableau.

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[6] McCarthy, J. and A. Prince. 1995. Faithfulness and reduplicative identity. In *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*. Amherst, MA: GLSA.

When you see a candidate in a tableau without indices, you can assume that the correspondence relation is the obvious one.

Sometimes it's not clear what the obvious correspondence relation is; in that case, you should spell it out (as in the tableau above)

A relation, like correspondence, can be defined by listing the items that bear that relation to each other:

input	output	
/t/————[t]		The correspondence relation here is {(/t/, [t]), (/u/, [y])}
/u/————[y]		
/i/		
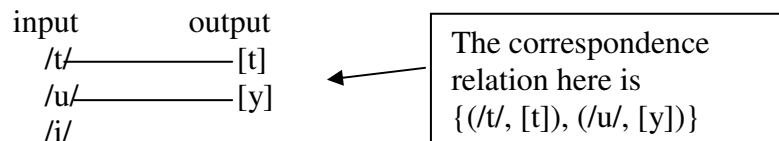
Faithfulness constraints (sometimes also called *correspondence constraints*) are constraints that care about various aspects of this mapping. Here are the ones proposed by McCarthy & Prince:

IDENT(F)	(don't change feature values)	Segments in correspondence must bear identical values for feature [F].
MAX-C MAX-V	(don't delete)	Every consonant in the input must have a correspondent in the output. Every vowel in the input must have a correspondent in the output.
DEP-C DEP-V	(don't insert)	Every consonant in the output must have a correspondent in the input. Every vowel in the output must have a correspondent in the input.

(MAX = *maximize* the preservation of material in the input
DEP = every segment in the output should be *depend* on a segment in the input.)

There are also constraints against merging, splitting, and reordering segments. See McCarthy & Prince 1995 for a full list.