Class 7: Optimality Theory, part II

To do
- Malagasy HW (last week's material) due tomorrow.
- Reading questions on K&K ch. 8 excerpt, Anderson 1984 ch. 9, Kaplan 2008 excerpt due Tuesday
- Bibliographic exercise due any time next week
- I'll post an assignment on this week's material; due *next* Friday.

Overview: Last time we talked in detail about how the theory works. This time, the focus will be on practicing using it. Plus, target vs. process; correspondence theory.

1. Exposition: the tableau

- Someday, we'll all check our analyses with software that evaluates the infinite candidate set.[1]
  - In the meantime, we illustrate an analysis with a *tableau*[2] showing a small subset of candidates that have been chosen to demonstrate aspects of the constraint ranking.
  - (The danger here is obvious—what if you didn't think of some important candidate?)

- This tableau shows a *ranking argument*:
  - NoCoda prefers *a* (the winner), whereas Dep-V prefers *b*.
  - If that's the only difference between the candidates—no other constraint prefers *a* over *b*, or there is one but we know it's ranked below Dep-V—then NoCoda must outrank (>>) Dep-V.

/at+ka/	NoCoda	Dep-V
☞ *a* [a.tə.ka]		*
b [at.ka]	*!	

Parts of the tableau:
- input
- output candidates (not all structure is necessarily shown)
- constraints (highest-ranked on left)
- asterisks
- exclamation marks
- shading
- pointing finger (you can use an arrow)

These three don't add any new information, but are there for the convenience of the reader.

[1] See Jason Riggle's page for some software along these lines: http://hum.uchicago.edu/~jriggle/riggleDiss.html

[2] French for 'table'. The singular *tableau* is pronounced [tabló] in French; a typical English adaptation is [tʰæblóʊ]. The plural *tableaux* is also pronounced [tabló] in French, [tʰæblóʊ] or [tʰæblóʊz] in English.

2. How do I know which candidates and constraints to include in my tableaux?

This procedure works reasonably well:

- Start with the winning candidate and the fully faithful candidate.
- If the winning candidate ≠ the fully faithful candidate…
  - Add the markedness constraint(s) that rule out the fully faithful candidate.
  - Add the faithfulness constraints that the winning candidate violates.
  - Think of other ways to satisfy the markedness constraints that rule out the fully faithful candidate. Add those candidates, and the faithfulness and markedness constraints that rule them out. How far to take this step is a matter of judgment .
- If the winning candidate = the fully faithful candidate...
  - ...then you are probably including this example only to show how faithfulness prevents satisfaction of a markedness constraint that.
    - Add that markedness constraint.
    - Add one or more candidates that satisfy that markedness constraint.
    - Add the faithfulness constraints that rule out those candidates.

- Let's try it for /atka/ → [atəka].

- You try it for /bid/ → [bit].

- One of the candidates below is unnecessary in arguing for the constraint ranking. Why?

/at+ka/	*CC	DEP-V
☞ *a* [atəka]		*
b [atka]	*!	
c [atəkəa]		**!

- A candidate is **harmonically bounded** if it could not win under any constraint ranking.

3. Comparative tableaux

- An innovation of Alan Prince. They convey the same information, but in a different form

/at+ka/ → [atəka]	*CC	DEP-V
a [atəka] vs. [atka]	W	L
b [atəka] vs. [atəkəa]		W

Each line compares the winner to one losing candidate, and shows whether each constraint prefers the winner (W) or the loser (L)

- Comparative tableaux are nice because you can easily see if your ranking is correct: the first non-blank cell in each row must say *W*.

  - We also see easily why [atəkəa] is irrelevant to the ranking—explain.

4. Exercise: Metaphony (just the two easy cases—we'll do hard ones later)

- Walker 2005 discusses Romance dialects/"dialects" in which suffix vowels spread their [+high] feature to the stem.

  - Develop OT accounts of these two metaphony systems (they can have different rankings, since they're different languages).

Foggiano/Pugliese (Ethnologue classifies as dialect of Italian). Vowel inventory: [i,e,ɛ,a,u,o,ɔ]

pɛ́t-e	'foot'	pít-i	'feet'
móʃʃ-a	'soft (fem.)'	múʃʃ-u	'soft (masc.)'
kjén-a	'full (fem.)'	kjín-u	'full (masc.)'
grɔ́ss-a	'big (fem.)'	grúss-u	'big (masc.)'

Veneto (~ 6 million speakers in Italy/Slovenia/Croatia and Brazil) Same vowel inventory.

véd-o	'I see'	te víd-i	'you see'
kór-o	'I run'	te kúr-i	'you run'
prɛ́t-e	'priest'	prɛ́t-i	'priests'
bɛ́l-o	'beautiful (masc. sg.)'	bɛ́l-i	'beautiful (masc. pl.)'
mɔ́d-o	'way'	mɔ́d-i	'ways'
gát-o	'cat'	gát-i	'cats'

5. Exercise: our bleeding example from English

- Translate our previous rule analysis into OT

(reminder: /z/, Ø → ɨ / [+strid]__[+strid], [–son] → [–voice] / [–voice] __)

pʰi-z	‘peas’	dɑg-z	‘dogs’	mɪt-s	‘mitts’	glæs-ɨz	‘glasses’
tʰoʊ-z	‘toes’	læb-z	‘labs’	bloʊk-s	‘blokes’	fɪz-ɨz	‘fizzes’
dɑl-z	‘dolls’	sɑlɪd-z	‘solids’	kʰɑf-s	‘coughs’	bɹæn͡tʃ-ɨz	‘branches’
pʰæn-z	‘pans’	weɪv-z	‘waves’			bæd͡ʒ-ɨz	‘badges’
		saɪð-z	‘scythes’			wɪʃ-ɨz	‘wishes’

- Could the counterbleeding candidate *[glæs-ɨs] win under any ranking of these constraints?

6. Very short feeding example

Catalan (Indo-European lang. from Spain, France, Andorra w/ 11.5 million speakers [Lewis 2009]; Mascaró 1976)

son	‘they are’	bint	‘twenty’
poks	‘few’	pans	‘breads’
som poks	‘they are few’	bim pans	‘twenty breads’

- Let’s develop a rule analysis together.
- Give an OT analysis.
- Could the counterfeeding candidate *[bin pans] win under any ranking of these constraints?

7. *If we have time:* counterfeeding that we can capture

Another Romance metaphony case from Walker 2005

Lena (dialect of Asturian, a language from Spain with about 100,000 speakers)

fí-a	'daughter'	fí-u	'son'
nén-a	'child (fem.)'	nín-u	'child (masc.)'
tsób-a	'wolf (fem.)'	tsúb-u	'wolf (masc.)'
gát-a	'cat (fem.)'	gét-u	'cat (masc.)'

- Develop a rule account
- What's the problem with translating this into OT (hint: [gét-u] is the problematic word)?
- Any ideas for playing with our faithfulness constraints to get this?

8. Opacity [more on this in Week 5!]

- We now have our first empirical difference between SPE and OT: SPE straightforwardly predicts counterfeeding and counterbleeding, and OT doesn't.
  - any purported case of counterfeeding or counterbleeding is a good **term-paper topic**
- In Week 6 we'll see a version of OT that does better with opacity (Kiparsky's Stratal OT).

9. We need a better theory of faithfulness

- Trick question: fill in the constraint violations:

/tui/	IDENT(round)	IDENT(back)
a [ty]		

- In Prince & Smolensky 1993, an output candidate contains the input form—you can see what's been inserted or deleted.
  - This is retrospectively known as the containment approach (output *contains* the input).
  - Changing features gets tricky, and metathesis gets very hard.

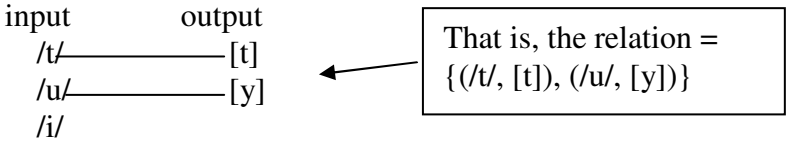
10. The correspondence relation

McCarthy & Prince 1995 proposed replacing containment with **correspondence**.

- Every segment in the input bears a unique index (maybe every feature, mora, syllable…).
- Units of the output also bear indices (instead of the output containing input material).
- An input segment and an output segment are *in correspondence* iff they bear identical indices.

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

- These indices define a relation between input segments and output segments:



- /$p_1a_2t_3o_4k_5$/ → [$p_1a_2t_3o_4k_5$] means Corr(/p_1/, [p_1]), Corr(/a_2/, [a_2]), etc., where Corr(*x*, *y*) means "*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 we wouldn't normally bother including them in a tableau.
- 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, spell it out.

11. Constraints on the relation

- The purpose for adding this relation to each input-output pair is so that constraints can use it.
- Faithfulness constraints (sometimes also called *correspondence constraints*) are constraints that care about various aspects of the correspondence relation.
- Here are the most important ones proposed by McCarthy & Prince:

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. (*max*imize the preservation of material in the input)
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. (every segment in the output should *depend* on a segment in the input.)
IDENT(F)	(don't change feature values)	If two segments are in correspondence, they must bear identical values for feature [F]. This constraint doesn't care about *whether* segments have correspondents or not; only about making sure feature values match *if* two segments do correspond.

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

12. Process vs. target

- Here's a difference between SPE and OT in typological predictions.
  - SPE might predict that similar rules (processes) should be seen across languages
  - OT predicts that a markedness constraint should trigger diverse repairs across languages.

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

Homogeneity of target
= languages impose the same well-formedness conditions on outputs

Heterogeneity of process
= languages use different means to satisfy the well-formedness conditions

13. Case study, if we have time: *NC̥ in Pater 2001; Pater 2003

- *NC̥ 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 1996.

- What ways can you think of to "repair" a sequence like *ampa*?
- Let's figure out the ranking for each of the following examples.

- Japanese

present	*past*	*gloss*
kat͡s-u	kat-ta	'win'
kar-u	kat-ta	'cut'
wak-u	wai-ta	'boil'
ne-ru	ne-ta	'sleep'
mi-ru	mi-ta	'look'
ʃin-u	ʃin-da	'die'
jom-u	jon-da	'read'

- "Puyo Pongo" Quichua

ʃiŋki	'soot'	t͡ʃuntina	'to stir the fire'
t͡ʃuŋga	'ten'	indi	'sun'
pampalʲina	'skirt'	ɲukant͡ʃi	'we'
hambi	'poison'	pund͡ʒa	'day'
wasi-ta	'house'	kan-da	'you'
ajt͡ʃa-ta	'meat'	atan-da	'the frog'
puru-ta	'gourd'	wakin-da	'others'
ali-t͡ʃu	'is it good?'	kan-d͡ʒu	'you?'
lumu-t͡ʃu	'manioc?'	tijan-d͡ʒu	'is there?'
mana-t͡ʃu	'isn't it?'	t͡ʃarin-d͡ʒu	'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-kúpja	'is wearing a kupia'

- 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		
	ə**mp**at	'four'
	u**nt**uk	'for'
	mu**ŋk**in	'possible'

- Kelantan dialect of Malay—I haven't been able to track down the real data, but it should look schematically 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'

  - Can we explain why it's always the nasal that deletes (not the following C)?

- English

ɪmp^{h}ɑsəbəl	'impossible'
ɪnt^{h}ɛmpəɹət	'intemperate'
ɪŋk^{h}ælkjələbəl	'incalculable'
ɪmbɝ̩b	'imberb'
ɪndisənt	'indecent'
iŋglɔɹiəs	'inglorious'

Some apparently unattested "solutions":

- Epenthesis /np/ → [nəp]
- Devoice the nasal /np/ → [m̥p][3]

14. *If we have time:* 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'

- What's the ranking? Let's do some tableaux

Next time:

- What happens when there are multiple places within a form where a rule could apply or a constraint is violated?
- What if applying a rule (satisfying a constraint) creates a new environment for the same rule to apply (creates a new violation of the same constraint)?
- We'll look at how this should play out in SPE (not always clear) and OT (clear, but are the typological predictions correct?)

[3] 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.

References

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