Class 15 (and half of 16): Process interaction II

Overview: We revisit the typology of opaque process interaction and what each theory predicts.

1.   **Theories roundup**

theory	*language-specific grammar consists of*	*feeding?*	*counter-feeding?*	*bleeding?*	*counter-bleeding?*	*global power?*	*priority for more-specific rules?*
SPE	ordered list of rules	yes	yes	yes	yes	no	yes, using ( )
SPE + Elsewhere Condition	ordered list of rules—but adjacent pairs are subject to Elsewhere Condition	yes	yes	yes	yes	no	**yes**
Partially indeterminate ordering, prefer maximal application	list of rules that is mostly ordered, but with some left unordered	yes	**yes, but is not default**	**yes, but is not default**	yes	no	yes, using ( )
Partially indeterminate ordering, prefer transparent application	*ditto*	yes	**yes, but is not default**	yes	**yes, but is not default**	no	yes, using ( )
one-shot simultaneous application	unordered set of rules	**no**	yes	**no**	yes	no	yes, using ( )
repeated simultaneous application	*ditto*	yes	**no**	**no**	yes	no	yes, using ( )
repeated simultaneous application + Proper Inclusion Precedence	*ditto*	yes	**no**	**no**	yes	no	**yes**
OT	ranking on universal set of constraints	yes	**no, except when big jump is prohibited**	yes	**no, except fusion**	**yes**	no
Harmonic Serialism	*ditto*	yes	*ditto*	yes	*ditto*	**yes**	no

- Of course, each theory also can have variants

2.   **Preferring specificity**

- <u>Proper Inclusion Precedence</u>: If any two rules are in a specificity relation—as defined by lining up their structural descriptions, where longer is more specific—then apply the more-specific one first, possibly preempting the less-specific one
- <u>Elsewhere Condition</u>: If any two *adjacent* rules are in a specificity relation—as defined by the set of forms they could apply to—and both could apply to a form, then apply the more-specific one *instead* of the less-specific one.
- <u>OT</u>: both rankings are possible, but the more-specific constraint won't be noticeable unless it's ranked higher *(see tableau)*

Pāṇini's Theorem (so named by Prince & Smolensky)

Pāṇini: Sanskrit grammarian, lived around 2500 years ago

17th-century manuscript of his grammar treatise

- General >> specific: specific constraint doesn't do anything

/akeʎ/	*ʎ	IDENT(lateral)	*ʎ#
a akeʎ	*!		*
☞ *b* akej		*	
/akeʎos/	*ʎ	IDENT(lateral)	*ʎ#
c akeʎos	*!		
☞ *d* akejos		*	

- Specific >> general

/akeʎ/	*ʎ#	IDENT(lateral)	*ʎ
a akeʎ	*!		*
☞ *b* akej		*	
/akeʎos/	*ʎ#	IDENT(lateral)	*ʎ
☞ *c* akeʎos			
d akejos		*!	

3.   The classic interaction typology, for reference

interaction	*definition*	*schematic derivation*	*result*
R1 feeds R2	R1 creates environment for R2 to apply to	$\qquad\qquad$ /bind/ d → Ø / __# $\quad$ bin n → Ø / __# $\quad$ bi $\qquad\qquad$ [bi]	transparent: • no [d#] on the surface • no [n#] on the surface
R1 counterfeeds R2	R1 applies too late to create environment for R2	$\qquad\qquad$ /bind/ n → Ø / __# $\quad$ -- d → Ø / __# $\quad$ bin $\qquad\qquad$ [bin]	opacity—*underapplication*: • [n#] on surface, despite rule targeting *n#*
R1 bleeds R2	R1 destroys environment for R2 to apply to	$\qquad\qquad$ /bind/ d → Ø / __# $\quad$ bin Ø → i/ C__C# $\;$ -- $\qquad\qquad$ [bin]	transparent: • no [d#] on the surface • no [i] inserted, because no surrounding *C__C#*
R1 counterbleeds R2	R1 applies too late to destroy environment for R2	$\qquad\qquad$ /bind/ Ø → i/ C__C# binid d → Ø / __# $\quad$ bini $\qquad\qquad$ [bini]	opacity—*overapplication*: • [i] inserted, despite lack of surrounding *C__C#*

- A rule *underapplies* if there are surface instances of its structural description.
- A rule *overapplies* if there are instances in which it has applied, although the non-affected part of the structural description (the environment) is no longer present.

(The terms *underapplication* and *overapplication* come from Wilbur's (1973) discussion of reduplication. McCarthy 1999 adapts them for discussing opacity.)

4.   Baković 2007, Baković 2011: dissociating opacity-vs-transparency from interaction type

Baković argues that the typology is **not**...

	transparency	underapplication opacity	overapplication opacity
feeding	✓		
bleeding	✓		
counter-feeding		✓	
counter-bleeding			✓
non-interaction	✓		

...but rather (at least)...

	transparency	underapplication opacity	overapplication opacity
feeding	✓	✓	✓
bleeding	✓		
counter-feeding	✓	✓	
counter-bleeding	✓		✓
other	✓	✓	

...so process-interaction types actually don't account for opacity vs. transparency.

Let's go through Baković's typology:

5. Counterfeeding-on-environment[1] → underapplication

Bedouin Arabic

UR	badw	
$a \to i /$ ___ σ	*n/a*	$= \mathbb{P}$
$G \to V/ C$ ___ #	badu	$= \mathbb{Q}$
SR	badu 'Bedouin'	

(Baković 2007, p. 222; from McCarthy 1999)

 ‽ What would be the transparent outcome?

6. Counterfeeding-on-focus → underapplication

Bedouin Arabic again

UR	katab	
$i \to \emptyset /$ ___ σ	*n/a*	$= \mathbb{P}$
$a \to i /$ ___ σ	kitab	$= \mathbb{Q}$
SR	kitab 'he wrote'	

(Baković 2007, p. 222; from McCarthy 1999)

 ‽ What would be the transparent outcome?

- This is the one that's easier in OT, because we just need to invent a faithfulness constraint that prohibits the big change (in this case, from a to Ø)

7. "Surface-true counterfeeding" → transparency!

Educated Singapore English: Baković 2011, p. 16;[2] from Mohanan 1992, Anttila et al. 2008

 Epenthesis: /reɪz+z/ → [reɪz+əz] (and, I infer, /reɪs/ → [reɪs+əz])
 Deletion: /test/ → [tes]   cf. /tɛst+ɪŋ/ → [tɛst+ɪŋ]
 no data, but Degemination "deletes one of two tautosyllabic near-identical consonants" (p. 16)
      /lɪst+z/ → [lɪs]

 ‽ In an SPE analysis, what rule order do we need to get [lɪs]? Why does B. call this result "transparent"?

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[1] Term from McCarthy 1999.
[2] Page numbers for manuscript version

8.   Underapplication without counterfeeding (Baković 2011 p. 8ff.)

"Disjunctive blocking" (p. 8)

- ❓ How would this rule schema apply to these words: $V \rightarrow$ [+stress] / __ $(C_2V)C_0$ # ?

        /badupil/   /pikomsak/

        Remember how expansion conventions work—abbreviates two rules, disjunctively ordered.

- ❓ In what sense does underapplication result?

Nonderived-environment blocking—we'll save that till Lexical Phonology, but essentially it's when an additional mechanism in the theory says that a rule can't apply if its structural description was already met in the monomorphemic underlying form:

    e.g. $a \rightarrow i$ / __ C#   /likat/ *fails to apply*   /noka+l/ $\rightarrow$ [nokil]

Blocking by phonotactic constraint (p. 12)

- ❓ Think of $V \rightarrow \emptyset$, blocked by *CCC. Strictly speaking, the rule $V \rightarrow \emptyset$ underapplies in forms like _____

(Non-)triggering by phonotactic constraint (p. 13)

- ❓ Think of $C \rightarrow \emptyset$, triggered by *CCC. Strictly speaking, the rule $C \rightarrow \emptyset$ underapplies in forms like _____

Restriction to certain morphological classes (Estonian V deletion in nominative singular only)

Optionality (French schwas may or may not delete)

Lexical exceptions (English *obesity* fails to undergo 'trisyllabic shortening')

9.   Fed counterfeeding[3] on environment→ underapplication

Lardil, as we've seen before

		a. /dibirdibi/	b. /yiliyili/	c. /wangalk/
Apocope:	V ⟶ Ø / σ σ __ #	Ø	Ø	
Deletion:	[–apical] ⟶ Ø / __ #	Ø		Ø
		[dibirdi]	[yiliyil]	[wangal]

Glosses: (9a) 'rock cod', (9b) 'oyster species', (9c) 'boomerang'
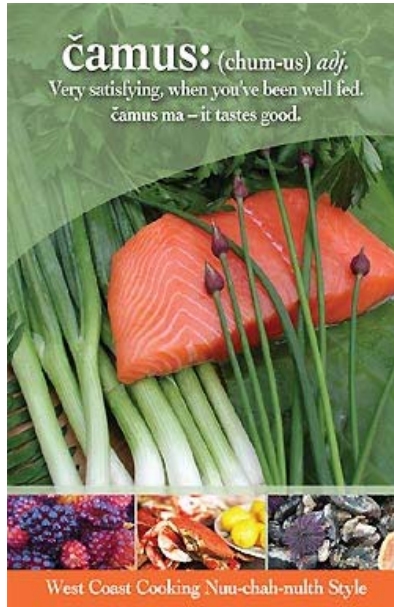
(Baković 2011, p. 6; from Hale 1973)

⁇ Any guesses as to why it's called "fed counterfeeding"?

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[3] Baković gets the term from Kavitskaya & Staroverov 2009

10. Fed counterfeeding on focus = "Duke of York" derivations[4]→ underapplication

Nuu-chah-nulth
- Wakashan language of Vancouver Island
- Formerly and erroneously known as Nootka

A cookbook available from Uu-a-thluk, a Nuu-chah-nulth environmental organization

Project to create totem pole symbolizing Nuu-chah-nulth language revitalization

	a. /mu:q/	b. /haju+q i/	c. /ɬa:kʷ+ʃitɬ/
Labialization: [+dors] ⟶ [+rnd] / [+rnd] __		qʷ	qʷ
Delabialization: [+dors] ⟶ [−rnd] / __]σ	q		k
	[mu:q]	[haju+qʷi]	[ɬa:k+ʃitɬ]

Glosses: (11a) 'throwing off sparks', (11b) 'ten on top', (11c) 'to take pity on'

(Baković 2011, p. 7; from Sapir & Swadesh 1978, McCarthy 1999, 2003, 2007a, 2007b)

☞ OT thoughts on this interaction?

/mu:q/			
☞ *a* mu:q			
b mu:qʷ			

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[4] Term from Pullum 1976
[5] https://hashilthsa.com/news/2019-06-05/funding-uncertain-language-revitalization-pole

11. Counterbleeding → overapplication

Yowlumne Yokuts (also spelled Yawelmani)

- Yok-Utian language of California's Central Valley
- California statehood brought epidemics and war that greatly reduced the number of Yokuts people, and forced survivors to share territory with speakers of other languages

[6]

Nicola Larsen, teaches Yowlumne language and culture classes at Tule River Reservation

Mary Santiago (center) ca. 1948, language teacher and survivor of forced removal from Madden Farm (Frank & Goldberg 2010 p. 55)

UR	ʔili:+l		
[+long] → [−high]	ʔile:l	= ℙ	cf. /ʔili:+hin/ → [ʔile:hin] 'fans'
V → [−long] / __ C#	ʔilel	= ℚ	cf. /pana:+l/ → [panal] 'might arrive'
SR	ʔilel	'might fan'	

(Baković 2007, p. 223; from McCarthy 1999)

☞ What would be the transparent outcome?

Since counterbleeding is so problematic in OT, here are some other famous cases:
- Canadian Raising vs. tapping in English ("Output-output Correspondence" helps)
- Serbo-Croatian *l*-vocalization (see Kenstowicz & Kisseberth 1979 ch. 3 exercise)

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[6] facebook

12. Counterbleeding by mutual bleeding → transparent!

Lardil, as you've seen (I think?)

a. /papi+ uɟ/ b. /tʲæmpæ+uɟ/

Epenthesis: Ø ⟶ w / i __ u   w

Elision: V ⟶ Ø / V __   Ø

[papi+wuɟ]   [tʲæmpæ+ɹ]

Glosses: (25a) 'father's mother (acc. fut.)', (25b) 'mother's father (acc. fut.)'

(Baković 2011, p. 22 of ms.; from Hale 1973)

❓ In what sense is this mutual bleeding?

❓ OT analysis?

13. "Self-destructive feeding"→ overapplication!

Turkish

UR	bebek+n		
Ø → i / C__ C#	bebekin	= ℙ	cf. /ip+n/ → [ipin] 'your rope'
k → Ø / V__ +V	bebein	= ℚ	cf. /bebek+i/ → [bebei] 'baby (ACC)'
SR	bebein	'your baby'	

(Baković 2007, p. 226; from Sprouse 1997)

UR	ajak+sɯ		
[+cont] → Ø/ C__	ajakɯ	= ℙ	cf. /arɯ+sɯ/ → [arɯsɯ] 'his bee'
k → Ø / V__ +V	ajaɯ	= ℚ	cf. /ajak+ɯ/ → [ajaɯ] 'foot (ACC)'
SR	ajaɯ	'his foot'	

(Baković 2007, p. 227; from Kenstowicz & Kisseberth 1979)

❓ What would be the transparent outcome?

14. Here's another one from Lee 2007

Javanese

- Austronesian from Indonesia
- about 84 million speakers;
- data originally from Dudas 1976; Lee 1999
- Now written in Roman letters, formerly used an Abugida

cover, Kajawen magazine, 1933

Kartini, Indonesian national hero

Pramoedya Ananta Toer, novelist

	'skin'	'school'	'house'
	/kulit+ne/	/sekolah+an/	/omah+ne/
n → Ø / C__	kulit+e	--	omah+e
h → Ø / V__V	--	sekola+an	oma+e
	[kulite]	[sekolaan]	[omae]

⍰ Could this work in Harmonic Serialism?

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[7] https://en.wikipedia.org/wiki/Javanese_script#/media/File:Kajawen_1933-08-16-1_sampul.jpg

15. Another type of feeding: American Sign Language (Padden & Perlmutter 1987)

- Sign language from the U.S., maybe 500,000 users
- Some notable ASL signers:

Marlee Matlin, actor   Christine Sun Kim, artist   Connie Briscoe, novelist
                               performed at Superbowl 2020   and L2 signer

- Rule of Weak Drop
    - Optionally, the non-dominant hand can be eliminated from a sign
    - Happens especially in fast or casual signing

full pronunciation   *pronunciation with Weak Drop*

(p. 350)

Ling 200A, Phonological Theory I. Fall 2020, Zuraw
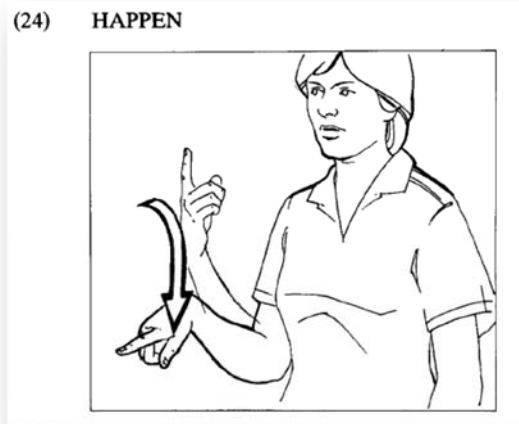
(26) **INTERESTING**

(p. 351)

(29) **ANALYZE**

(28) **ANALYZE (Weak Drop)**

(p. 352)

(31) **READ**

(30) **READ (Weak Drop)**

(p. 353)

- o But Weak Drop is possible only if the movement in the underlying form of the sign is not "alternating"
    - nothing to do with when we say a morpheme or phoneme alternates!
    - "alternating" here = the hands move in opposition, not in synchrony
    - Examples of "alternating" signs—these have no Weak Drop version
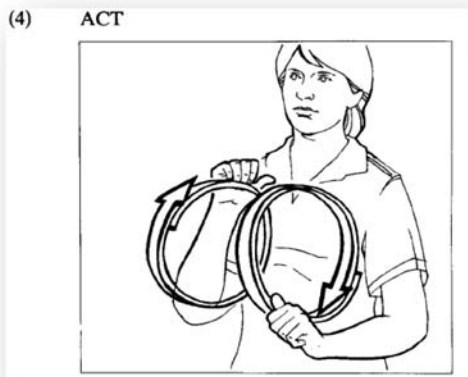
(p. 339)
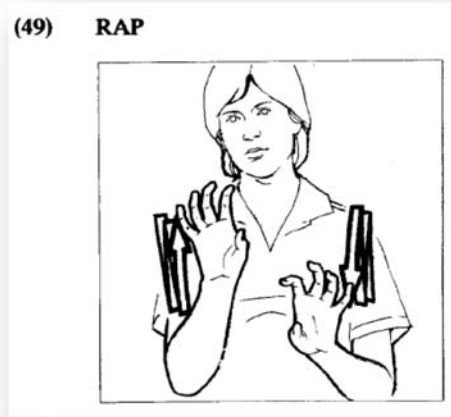
(p. 363)

- There's a morphological rule that forms nouns from verbs, like ACTING from ACT
    - o Adds "trilled" movement ("small, quick, stiff movements", p. 343)

(p. 343) *Note: ACTING is "alternating"*

- Another rule: Weak Freeze
    - o   Like Weak Drop, it optionally applies to two-handed signs
    - o   Keeps the non-dominant hand, but removes its movement
    - o   Can only apply to signs with "tense" movement (including trill)


(36)   ACTING (WF)

(p. 356)

- Let's figure out the order of Weak Drop and Weak Freeze
    - ❔   Try applying both orders to ACTING, then see next page

- o   As it turns out, ACTING does have a version with Weak Drop (sorry, no drawing)
- o   More examples of signs that can undergo both rules (pp. 364-365)
  - ▪ unforntunately, again no drawing for the Weak Drop version, but it exists in each case
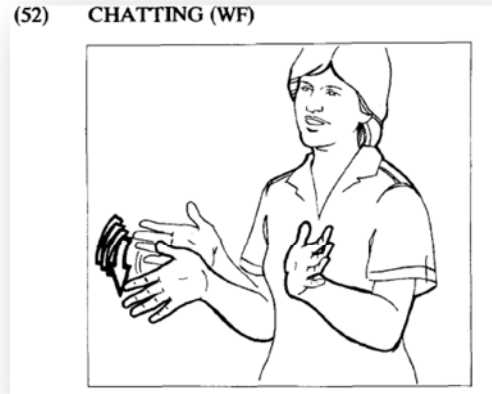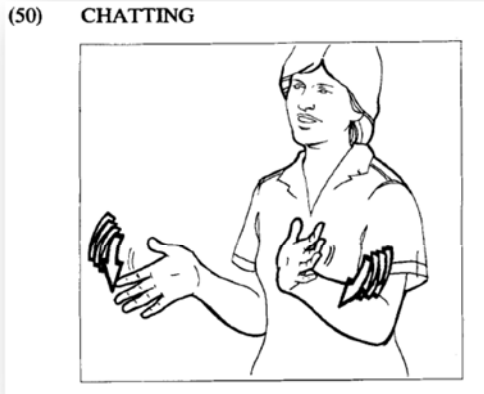
this one doesn't tell us anything about ordering—can you see why?
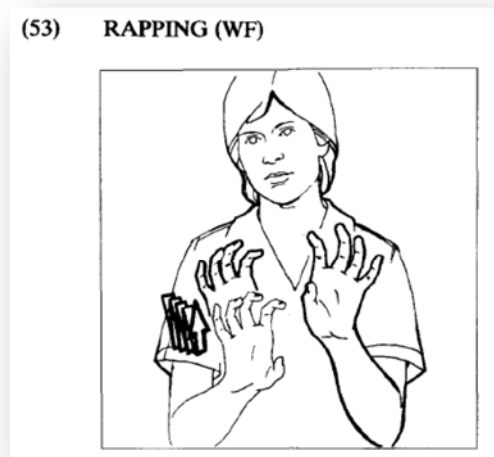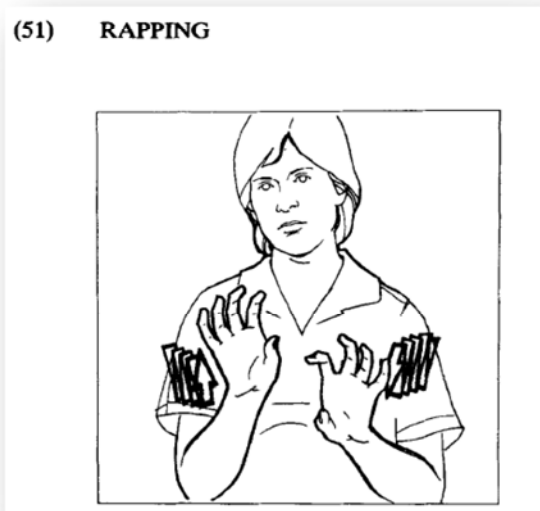
this one supports the same ordering as ACTING does

⁇   What does this tell us about the order?

- In one sense this is straightfoward feeding: A → B, and B → C (two context-free rules)
  - But the only reason we can observe A → B is that B → C is optional
  - If both rules were obligatory, it would look like {A, B} → C
    - I think this would be an example of what Baković calls a **concealed free ride** (feeding-on-focus, technically transparent, but nonetheless part of the derivation is obscured by another)
  - So it's something like "feeding exposed by early stopping of the derivation"

16. "Non-gratuitous feeding" → overapplication

Classical Arabic

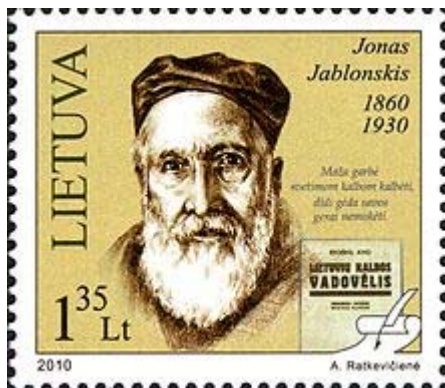|	
UR	ktub
$\emptyset \rightarrow V_i \, / \, \# \_\_ CCV_i$	uktub $= \mathbb{P}$
$\emptyset \rightarrow ʔ \, / \, \# \_\_ V$	ʔuktub $= \mathbb{Q}$ cf. /al-walad-u/ → [ʔalwaladu]
SR	ʔuktub 'write (MASC SG)!' 'the boy (NOM)'

(Baković 2007, p. 231; from McCarthy 2007b)

❓ What would be the transparent outcome?

17. "Cross-derivational feeding" → overapplication, in a sense

Lithuanian
- Indo-European language from Lithuania, 3 million speakers

Jonas Jablonskis, linguist   *Jurgita Štreimikytė, retired WNBA player*

- data from Baković 2007, p. 234ff.; see there for references

prefix obstruents assimilate in voicing and palatalization :

at-koːpʲtʲi	'to climb up'	ap-kalʲbʲetʲi	'to slander'
ad-gautʲi	'to get back'	ab-gautʲi	'to deceive'
atʲ-pjʲautʲi	'to cut off'	apʲ-tʲemʲdʲiːtʲi	'to obscure'
adʲ-bʲekʲtʲi	'to run up'	abʲ-gʲiːdʲiːtʲi	'to cure (to some extent)' (p. 234)

epenthesis between stops of the same place (also palatalization before [i]):

atʲi-taikʲiːtʲi	'to make fit well'	apʲi-putʲi	'to grow rotten'
atʲi-tʲeisʲtʲi	'to adjudicate'	apʲi-pʲiːlʲtʲi	'to spill something on'
atʲi-duotʲi	'to give back'	apʲi-barʲtʲi	'to scold a little bit'
atʲi-dʲetʲi	'to delay'	apʲi-bʲerʲtʲi	'to strew all over' (234)

- Baković 2005 argues that the right analysis here (and in English epenthesis before /-d/ and /-z/) should capture the idea that epenthesis occurs where a geminate *would have occurred* (because of assimilation).
  - Assimilation <u>would have fed</u> epenthesis (which in Baković's analysis is only triggered between identical segments), but assimilation doesn't end up needing to apply (bleeding

  ? Why is this hard for SPE?

That completes our tour of Baković's typology. But here are a couple more types:

18. Wolf 2011: "mutual counterfeeding" in Hindi-Urdu

Indo-European language from India and Pakistan w/ about 240 million speakers [Lewis 2009], data and analyses originally from Narang & Becker 1971, Bhatia & Kenstowicz 1972.

? Fill in the SPE-style derivation, including predicted surface form for 'mind':

	/nikəl-naː/	/nikəl-a:/	/angən-on/	/maːnəsi/
schwa deletion: ə →Ø / VC__CV				
V nasalization: V C {C 1 1 [+nas] #} → [+long 2 3 +nas]				
	[nikəlnaː] 'to come out'	[nikl-aː] 'came out'	[ãːgən-õ:] 'courtyard-*obl.pl.*'	? 'mind-*adj.*'

- Problem: surface form is actually [maːnsi].
  - ❓ What rule ordering does this require? What's the problem?

  - ❓ What outcome do we get if both rules apply simultaneously to the input (no iteration)?

- See Bhatia & Kenstowicz (or Wolf) for arguments that the V nasalization rule doesn't actually exist in this language—nasal vowels are just underlying, so the problem goes away.

19. Wolf 2010: counterfeeding from the past

- The name comes from Wilson 2006.
- See the Wolf paper for more cases.

Samothraki Greek, (Kaisse 1975):		'carry-past.theme-1.pl'		'day'
		/fér+a+me/		/mér+a/
feeding:	r → Ø / V__V	fé+a+me		mé+a
	{a,e}→ i / __+{a,o}	fi+a+me		mí+a
		[fíami] (other rules apply to last V, I guess)		[mía]

feeding:		'Greek'	'old'	'one'
		/romé+os/	/palé+os/	/mía/
	{a,e}→ i / __+{a,o}	romí+os	palí+os	--
	V → [-syll] / __+V	romj+ós	palj+ós	mjá
		[romjós]	[paljós]	[mjá]

  - ❓ What's the problem here for putting all three rules in an order? (Hint: *[fjámi])

- Gliding somehow doesn't get to apply if it was originally fed by *r*-deletion. None of our theories predict this (I think), but OT with "candidate chains" does.

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