

Class 12: Lexical Phonology part II

To do

- due Friday (Nov. 9): process interaction in Kalinga
- NO CLASS MONDAY
- due Wednesday (Nov. 14): Steriade reading questions
- term paper: meet with me again by the end of *next* week

Overview: Last time (and today, as we finished the Class 11 handout) we looked at a model where phonological processes are divided into lexical (interleaved with morphology [“cyclic”], forms words) and postlexical (whole utterances, morpheme boundaries and diacritics are gone).

This time we’ll see evidence for further articulating the lexical component, and further discuss the model.

1. Observation III: two classes of affix in English (and many other languages)

<i>suffix examples</i>	<i>-al, -ous, -th, -ate, -ity, -ic, -ify, -ion, -ive, -ize</i>	<i>-ship, -less, -ness, -er, -ly, -ful, -some, -y, -ish</i>
stress shift?	párent vs. parént-al spécify vs. spécif-ic	párent vs. párent-less cáreful vs. cáreful-ly
trisyllabic shortening?	ev[ou]ke vs. ev[a]c-at-ive der[ar]ve vs. der[r]v-at-ive	s[ou]l vs. s[ou]l-less-ness gr[er]teful vs. gr[er]teful-ly
velar softening?	opa[k]e vs. opa[s]-ity cliti[k] vs. cliti[s]-ize	opa[k]e vs. opa[k]ish cliti[k] vs. cliti[k]-y
<i>prefix examples</i>	<i>in-, con-, en-</i>	<i>un-, non-</i>
can bear main stress?	cón-template, ín-filtrate	-- (rarely)
obligatory assim. of nasal?	il-egal, com-prehend	un-lawful, non-plus
<i>both</i>		
attach to bound morph.?	caust-ic, con-flict	-- (rarely)
ordering	act-iv-at-ion-less-ness ¹ , non-in-com-prehens-ible ²	
semantics	riot vs. riot-ous margin vs. margin-al	riot vs. rioter fresh vs. fresh-ness

Prefixes that come in two flavors: *re-*, *de-*, *sub-*, *pre-*; (also homophones: there are two totally different –ys) and of course there are exceptions...

¹ “the correspondingly predicted near-**activationlessness** of the reaction” (www.pnas.org/cgi/content/full/101/46/16198)

² “great cast, snappy dialogue, non-boring **non-incomprehensible** non-insane plotting” (www.thepoorman.net/archives/002732.html)

2. Solution in Lexical Phonology: lexical component is broken into *levels*

...each with their own WFRs and phonological rules

- WFR = word formation rule (i.e., a morphological operation). Could be adding an affix, could be something else (e.g., *sing* → *sang*).

English (amalgam of Kiparsky 1982a; Kiparsky 1982b, Mohanan 1986, who proposes 4 levels for English):

Level 1	WFRs	irregular inflection (tooth/teeth) “primary” derivational affixes (- <i>al</i> , - <i>ous</i> , - <i>ant</i> , <i>in-</i> etc.), including some Ø affixes
	Phon. rules (selected)	stress (<i>paréntal</i>) trisyllabic shortening (<i>opacity</i>) obligatory nasal assimilation (<i>illegal</i>) syllabification, including rule that C syllabified in onset if followed by V (<i>cyclic</i>) velar softening (<i>electricity</i>)
Level 2	WFRs	secondary derivational affixes (- <i>ness</i> , - <i>er</i> , <i>un-</i> , etc.) compounding (<i>blackbird</i>)
	Phon. rules	compound stress (<i>bláckbìrd</i>) $n \rightarrow \emptyset / C_]\#$ (<i>damning</i> vs. <i>damnation</i>) $g \rightarrow \emptyset / _ [+nas]\#$ (<i>assigning</i> vs. <i>assignment</i> ³)
Level 3	WFRs	regular inflectional affixes (- <i>s</i> , - <i>ed</i> , - <i>ing</i>)
	Phon. rules	sonorant resyllabification is only optional $_V$ (<i>cycling</i>)
Postlexical	Phon. rules	aspiration, tapping (no morphology occurs after the lexical component, so no WFRs)

- If a word bears *n* affixes from the same level, it goes through that level’s phonology *n* times.
- The output of each level (or, depending on the author, the output of each cycle) is a lexical item. (Everyone clear on the difference between cycle and level?)
- How does this explain why Level 2 affixes can’t attach to bound roots?
- Compare the derivations for *damnation* [dæmn-eɪʃən] and *damning* [dæm-ɪŋ].
- How is this (disputed!) asymmetry in compounds explained in the model?

tooth marks	teeth marks	claw marks	*claws marks
louse-infested	lice-infested	rat-infested	*rats-infested

³ though also some problematic cases like ?*assigner*. For a completely different view of all this, see Hay 2003.

3. Exercise: Conservative European Spanish example (based on Harris)

Palatal and alveolar nasals and laterals contrast:

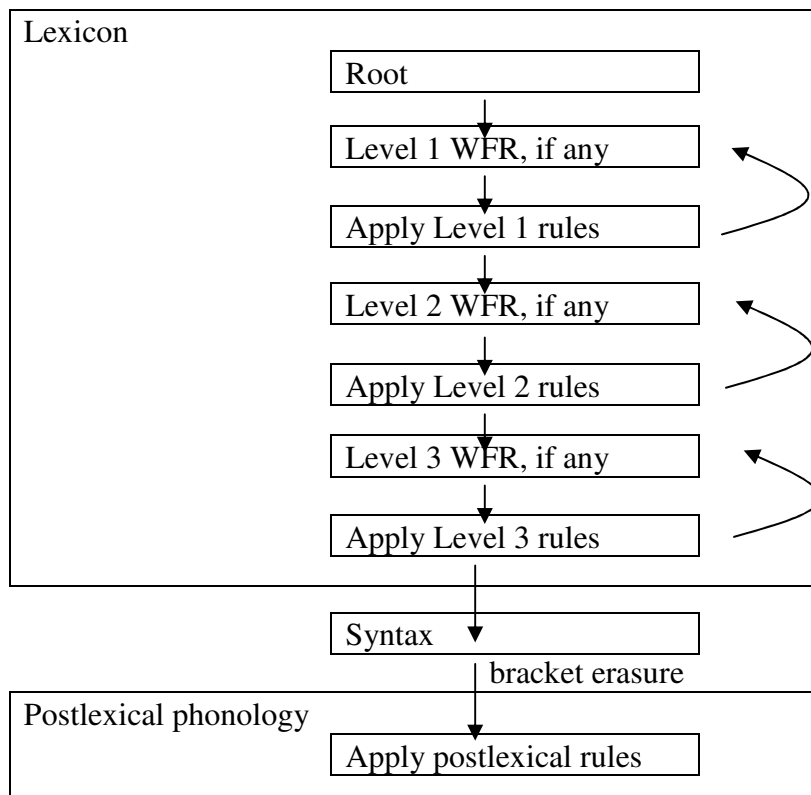
ka.na	‘grey hair’	po.lo	‘pole’
ka.ɲa	‘cane’	po.ʎo	‘chicken’

But the contrast is neutralized in some environments

dezðeɲ+ar	‘to disdain’	donθeɲ+a	‘maiden’
dezðeɲ+oso	‘disdainful’	donθeɲ+a+s	‘maidens’
dezðeɲ	‘disdain (N)’	donθel	‘swain’

- What about these forms—what can we conclude about levels in Spanish?
 dezðeɲ+es ‘disdain (N, plural)’ donθel+es ‘swains’

4. Putting it all together



Should the root pass through the Level 1 rules first thing? Or should it first undergo a Level 1 WFR (if there is one), as illustrated? Not clear (empirical question).

In adapting the theory to OT (“Stratal OT”), Kiparsky tends to employ just two lexical levels: **Stem Level** and **Word Level**, plus a Postlexical Level (e.g., Kiparsky 2000).

5. Dissent

- Some have argued that affixes don't fall neatly into 2-3 discrete categories,
 - and/or that an affix's behavior can be predicted from its phonological makeup and its distribution (Plag 1999; Hay & Plag 2004; Raffelsiefen 1999; Hay 2003).
- One postlexical phonology probably isn't enough.
 - Some have argued that different postlexical rules can be assigned to different-sized phonological domains such as phonological phrase, intonational phrase, utterance (Selkirk 1978; Selkirk 1980; Nespor & Vogel 1986, Jun 1993)
 - Others argue that these phonological domains influence phonological rules quantitatively, not categorically (Féry 2004), so the postlexical level can't be neatly divided up.

6. Aside: are the rules of the lexical component psychologically real?

- Pierrehumbert 2006: asks English speakers to form noun forms of invented adjectives
 - Latinate, ending in -ic: “Halley’s comet is a very interponic comet. Its orbital period varies because of its ??????” (p. 91)
 - Semi-Latinate, [ɛ,æ,a] in last syll: “Before Pierre stood an electrifyingly hovac sculpture. In his entire career as a curator, he had never before seen such a perfect example of ??????” (p. 91)
 - Non-Latinate, single syll: “Inside, the light was so dim it was entirely mork. We couldn’t read the instructions in the ??????” (p. 91)

10 subjects, 8 items of each type.

- Results
 - Latinate: Subjects used *-ity* 30/80 times, applied velar softening to 93% of those
 - Semi-Latinate: Subjects used *-ity* 36/80 times, applied velar softening to 83% of those
 - Non-Latinate: Subjects used *-ity* 5/80 times, no velar softening
 - 8/10 subjects produced at least some velar softening.
- ⇒ It's pretty productive, but not totally; subjects know something about what makes a word likely to undergo velar softening (syllable count, stress pattern, vowel of last syll—see Pierrehumbert for full model)

7. One last thing: Non-derived-environment blocking (NDEB)

- We won't try to solve this problem, but you should be aware of the phenomenon.

Finnish (Kiparsky 1973, pp. 58-60 plus a few dictionary and Verbix examples)

Ignore various other rules: vowel harmony, degemination, a~o...

<i>to X</i>	<i>Let him/her X!</i>	<i>'active instructive infinitive II'</i>	<i>she/he was Xing</i>	
halut+a	halut+koon	halut+en	halus+i	'want'
noet+a	noet+koon	noet+en	nokes+i	'smudge (?)'
piet+æ	piet+køøn	piet+en	pikes+i	'pitch'
filmat+a	filmat+koon	filmat+en	filmas+i	'film'
<i>These show that the [t] above isn't part of the suffix:</i>				
oll+a	ol+koon	oll+en	ol+i	'be'
aja+a	aja+koon	aja+en	ajo+i	'go'
puhu+a	puhu+koon	puhu+en	puhu+i	'speak'

- The data above suggest $t \rightarrow s / _ i$. Can we modify the rule for these cases?

tila	'room'	lahti	'Lahti'	cf.
æiti	'mother'	mæti	'roe'	paasi 'boulder'
silti	'however'	limonaati	'lemonade'	sinæ 'you (sg.)'
valtion	'public'			kuusi 'six'

- Another rule is needed to account for this vowel alternation:

joke+na	'river' essive sg.	joki	'river' nom. sg.
mæke+næ	'hill' essive sg.	mæki	'hill' nom. sg.
<i>These suggest the above words end in /e/</i>			
æiti+næ	'mother' essive sg.	æiti	'mother' nom. sg.
kahvi+na	'coffee' essive sg.	kahvi	'coffee' nom. sg.

- How should the two rules be ordered, given these data? (ignore h~k alternation)

vete+næ	'water' essive sg.	vesi	'water' nom. sg.
kæte+næ	'hand' essive sg.	kæsi	'hand' nom. sg.
yhte+næ	'one' essive sg.	yksi	'one' nom. sg.

- What's the problem in *vesi*?

- The proposal in Lexical Phonology: the "Strict Cycle Condition" (Mascaró 1976)
 - lexical rules (at least those that change feature values, rather than filling in underspecified feature values or adding syllable structure) can apply only to environments newly made, by either a morphological operation or a phonological rule *in the same cycle*.
 - This phenomenon is known as **non-derived environment blocking (NDEB)**.
 - See also Kiparsky 1985; Kaisse & Shaw 1985; Booij & Rubach 1987; Hualde 1989; Kean 1974 ...
- In my opinion, this solution never totally worked, so rather than go through the details of the proposals, let's just see another classic example.

Sanskrit “*ruki*”⁴ (also Kiparsky 1973, pp. 61-)

s → ś / {r, u, k, i} ___

da+dā+si	‘you give’	bi+bhar+ṣi	‘you carry’
kram+ṣja+ti	‘he will go’	vak+ṣja+ti	‘he will say’

○ How is this like Finnish?

bisa	‘lotus stalks’	viṣa	‘poison’	ṣaṣ	‘six’
busa	‘thicket, darkness’	śīrṣan	‘head’	kāṣṭa	‘piece of wood’
barsa	‘tip’	piṣ	‘crush’	bāṣpa	‘tear’
kisalaja	‘sprout’	juṣ	‘enjoy’	bhāṣ	‘speak’
kusuma	‘flower’	karṣ	‘drag, plow’	ṣṭhīv	‘spit’
bṛsī	‘ascetic’s seat’	śuṣ	‘dry’	laṣ	‘desire’
pis	‘move’	dvīṣ	‘hate’	kaṣ	‘scratch’
bṛsaja	‘mighty’	śiṣ	‘remain’		

<i>ablaut</i>	sas	‘instruct’	/sas+ta/ → sista → [siṣ+ta]	participle
<i>V-deletion</i>	ghas	‘eat’	/ga+ghas+anti/ → dʒa+ks+anti → [dʒa+kṣ+anti]	3 pl.

- As Wolf 2008 discusses, there are only about 3 cases in which some derived-environment-only rule can be fed by either a morphological or a phonological operation, and they can be re-analyzed (e.g., Hammond 1991 for Finnish).
 - For some alternative theories, see Wolf 2008, McCarthy 2003, Lubowicz 2002

Next time (Wed., not Mon.). One last piece of theory-comparison: does OT go too far in predicting multiple repairs for each markedness constraint (i.e., conspiracies)?

References

- Booij, Geert & Jerzy Rubach. 1987. Postcyclic versus postlexical rules in lexical phonology. *Linguistic Inquiry* 18. 1–44.
- Féry, Caroline. 2004. Gradient prosodic correlates of phrasing in French.. In Trudel Meisenburg & Maria Selig (eds.), *Nouveaux départs en phonologie*. Tübingen: Narr.
- Hammond, Michael. 1991. *Deriving the strict cycle condition*.
- Hay, Jennifer. 2003. *Causes and consequences of word structure*.. Routledge.
- Hay, Jennifer & Ingo Plag. 2004. What Constrains Possible Suffix Combinations? On the Interaction of Grammatical and Processing Restrictions in Derivational Morphology. *Natural Language & Linguistic Theory* 22(3). 565–596.
- Hualde, Jose. 1989. The strict cycle condition and noncyclic rules. *Linguistic Inquiry* 20. 675–680.
- Jun, Sun-Ah. 1993. *The Phonetics and Phonology of Korean Prosody*.. Ohio State University.
- Kaisse, Ellen M & Patricia Shaw. 1985. On the theory of lexical phonology. *Phonology* 2. 1–30.
- Kean, Mary-Louise. 1974. The strict cycle in phonology. *Linguistic Inquiry* 5. 179–203.

⁴ Vennemann 1974 proposes that this is because the coarticulations that *r,u,k,i* impose on a following [s] are acoustically similar (though articulatorily diverse). [r] is apparently retroflex, so it would induce retroflexion; [u] would induce rounding; [k] would induce palatalization (because of back tongue position), and so would [i], as it does in many languages. All of these changes (to, roughly, [ʃ], [s^w], and [ʃ]) would cause the fricative noise of [s] to lower in frequency, because the resonant cavity in front of the constriction becomes bigger. It would therefore be difficult to maintain a contrast between [s] and [ʃ] in the post-*ruki* environment.

- Kiparsky, Paul. 1973. Abstractness, opacity and global rules.. In O. Fujimura & O. Fujimura (eds.), *Three Dimensions of Linguistic Theory*, 57–86. Tokyo: TEC.
- Kiparsky, Paul. 1982a. Lexical Morphology and Phonology. *Linguistics in the Morning Calm*. Hanshin Publishing Co.
- Kiparsky, Paul. 1982b. From cyclic phonology to lexical phonology.. In Harry van der Hulst & Norval Smith (eds.), *The Structure of Phonological Representations*, vol. 1, 131–175. Dordrecht: Foris.
- Kiparsky, Paul. 1985. Some consequences of Lexical Phonology. *Phonology* 2. 85–138.
- Lubowicz, Anna. 2002. Derived Environment Effects in Optimality Theory. *Lingua* 112. 243–280.
- Mascaró, Joan. 1976. Catalan Phonology and the Phonological Cycle.. MIT.
- McCarthy, John J. 2003. Comparative Markedness. *Theoretical Linguistics* 29(29). 1–51.
- Mohanan, K. P. 1986. *The Theory of Lexical Phonology*.. Dordrecht: Reidel.
- Nespor, Marina & Irene Vogel. 1986. *Prosodic Phonology*.. Dordrecht: Foris.
- Pierrehumbert, Janet B. 2006. The statistical basis of an unnatural alternation.. In Louis M Goldstein, D. H. Whalen, & Catherine T. Best (eds.), *Laboratory Phonology* 8. Walter de Gruyter.
- Plag, Ingo. 1999. *Morphological productivity: structural constraints in English derivation*.. Berlin: Mouton de Gruyter.
- Raffelsiefen, Renate. 1999. Phonological constraints on English word formation.. In Geert E Booij & Jaap van Marle (eds.), *Yearbook of Morphology 1998*, 225–287. (Yearbook of Morphology 8). Springer.
- Selkirk, Elisabeth. 1978. On prosodic structure and its relation to syntactic structure.. In T. Fretheim (ed.), *Nordic Prosody*, vol. 2, 111–140. Trondheim: TAPIR.
- Selkirk, Elisabeth. 1980. Prosodic domains in phonology: Sanskrit revisited.. In Mark Aronoff, M. -L Kean, Mark Aronoff, & M. -L Kean (eds.), *Juncture*, 107–129. Saratoga, CA: Anma Libri.
- Vennemann, Theo. 1974. Sanskrit ruki and the concept of a natural class. *Linguistics* 130. 91–97.
- Verbix. Verbix verb conjugator -- Finnish verb conjugation. <http://www.verbix.com/languages/finnish.shtml> (27 February, 2012).
- Wolf, Matthew. 2008. Optimal Interleaving: serial phonology-morphology interaction in a constraint-based model.. University of Massachusetts Amherst.