Class 15: Phology-morphology interface, part I

To do
- Chaha assignment (on last week's material) is due Friday
- Meet with me a second time by end of this week

Overview: Until now we haven't worried much about how morphology gets into the input, or in what ways the phonology can care about it. We'll investigate these questions this week.

0. Discussion of Shona

1. Observation I: two kinds of rules

English "trisyllabic shortening"

op[ej]k	op[æ]c-ity
s[ej]ne	s[æ]n-ity
ser[iː]ne	ser[ɛ]n-ity
obsc[i]ne	obsc[ɛ]n-ity
div[aj]ne	div[ɪ]n-ity
prof[aw]nd	prof[ʊ]nd-ity
[ow]men	[ɑ]min-ous
kin[i]sis	kin[ɛ]t-ic
interv[i]ne	interv[ɛ]n-tion
cf.	
	[ow]men-ful
	div[aj]n-able
	op[ej]c-ating
ob[iː]se	ob[iː]s-ity
	n[aj]tingale
	how op[ej]que is it?

English tapping (a.k.a. flapping)

corro[d]e	corro[ɾ]ing
mee[t]	mee[ɾ]ing
i[d]yllic	i[ɾ]yll
a[t^{h}]omic	a[ɾ]om
di[d]	You di[ɾ] it.
wha[t]	Wha[ɾ] a day!

	trisyllabic shortening	*tapping*
exceptions?		
sensitive to morphology?		
applies across word boundaries?		
creates sounds not in phoneme inventory?		
characteristic of English-speakers' L2 accents?		
obvious to untrained native speaker?		

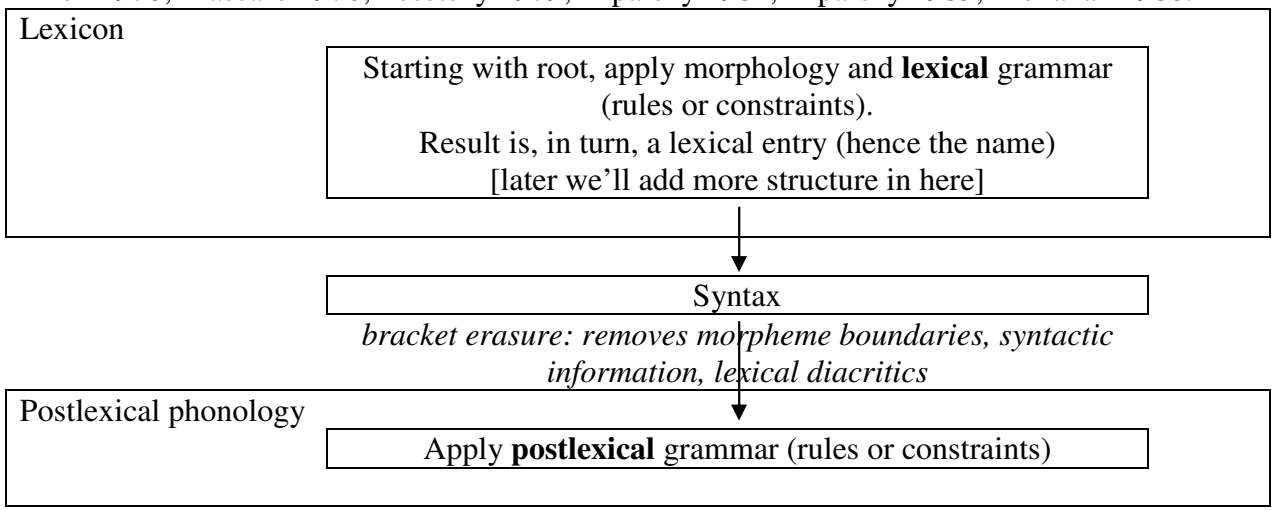
2. Some other rules in English that exhibit one syndrome or the other

Like trisyllabic shortening
- velar softening: *electri[k]* vs. *electri[s]ity*
- obligatory nasal assimilation: *i**l**-legal*, *co**m**-prehend*

Like tapping
- aspiration of voiceless stops
- optional palatalization: *I miss you. Got your sweater? Did you want fries with that?*
- coda-l-velarization: *feel* vs. *leaf*

3. Explanation in Lexical Phonology

Really, a theory of morphology and phonology. Founding works: Chomsky 1965; Kean 1974; Allen 1978; Mascaro 1976; Pesetsky 1979; Kiparsky 1982; Kiparsky 1985; Mohanan 1986.



- Why can't postlexical rules have exceptions?
- Why can't postlexical rules be sensitive to morphology?
- Why don't lexical rules apply across word boundaries, and why do postlexical rules?

- "Structure preservation": a rule is called *structure preserving* iff the segments it outputs are in the phoneme inventory
  - Why must lexical rules be structure-preserving?

- L2 accent: Although it doesn't follow directly from the model, the idea is that because postlexical rules are automatic and can't be turned off according to morphological or lexical information, they somehow also don't get turned off when speaking another language.
- Intuitions: The claim is that when making judgments about whether sounds are the same or different, speakers look at a lexical entry, not a surface form.

See Goldrick & Rapp 2007 for neurolinguistic evidence of a lexical-postlexical dissociation, and a literature review of other psycholinguistic investigations of the putative distinction.

4. This theory can also solve *some* opacity problems, in its OT version

Recall Yokuts counterbleeding. In classic OT, it would be tough to rule out **ʔilil*

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'	

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

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But, if lowering is a lexical rule, and shortening is postlexical,[1] it works:

[1] or at least at a later level than lowering. I haven't looked into Yokuts to see if this is plausible.

LEXICAL /ʔili:+l/		*[+long,+hi]	IDENT(long)	IDENT(hi)	*[V,+long]C#
a	ʔili:l	*!			*
☞ b	ʔile:l			*	*
c	ʔilil		*!		
d	ʔilel		*!	*	

POST-LEXICAL /ʔile:l/		*[+long,+hi]	*[V,+long]C#	IDENT(long)	IDENT(hi)
e	ʔili:l	*(!)	*(!)		
f	ʔile:l		*!		
g	ʔilil			*	*!
☞ h	ʔilel			*	

Self-counterfeeding and self-counterbleeding are still not predicted in general!

5. Observation II: carry-over from morphological base

Long monomorphemes suggest default English stress is (ὸσ)σ...:

(Tàta)ma(góuchi) (Wìnne)pe(sáukee) (àbra)cadábra (Pàssa)ma(quóddy)
(Pòpo)ca(tépetl) (ròdo)mon(táde) (Kàla)ma(zóo)

- So why these?

recìprocálity (*rèciprocálity) munìcipálity (*mùnicipálity)
apòlogétic (*àpologétic) relìgiósity (*rèligiósity)

6. Solution: the transformational cycle

Some or all of the lexical component is sometimes called the "cyclic" component. This goes back to an idea found in SPE, with syntactic antecedents:

"We assume as a general principle that the phonological rules first apply to the maximal strings that contain no [syntactic] brackets, and that after all relevant rules have applied, the innermost brackets are erased; the rules then reapply to maximal strings containing no [internal] brackets, and again innermost brackets are erased after this application; and so on, until the maximal domain of phonological processes is reached." (Chomsky & Halle 1968, p. 15)

7. An example with the giant SPE English stress rule

Claim: *pérmìt* (noun) and *Kérmit* have different stress

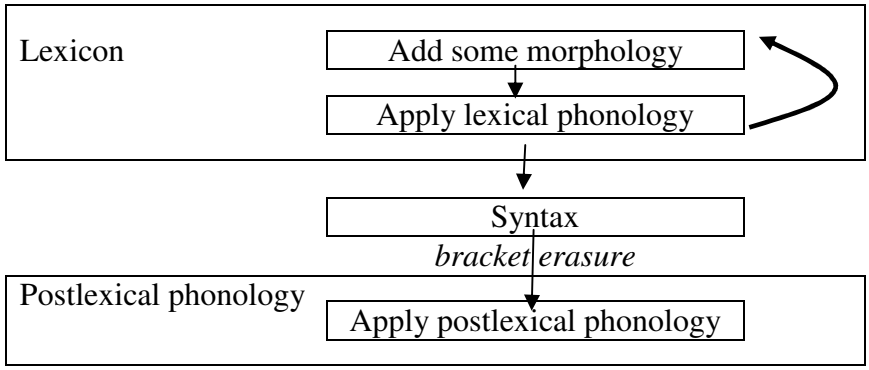
- underlying: **[$_N$ [$_V$ per=mit]$_V$]$_N$**
- apply the rule to **[$_V$ per=mit]$_V$**
- → **[$_V$ per=mít]$_V$** (if there's a "=", the rule requires stress to be after it)
- erase its brackets: **per=mít**
- now the maximal internal-bracketless string is **[$_N$ per=mít]$_N$**
- apply the rule to **[$_N$ per=mít]$_N$**
- → **[$_N$ pér=mìt]$_N$** (if a noun's final morpheme is stressed, the new stress goes somewhere before that morpheme; old stress is demoted but still stressed)

8. Another classic : even if stress itself isn't maintained, vowel quality can be

còm.p[ə]n.sá.tion *còm.p[ɛ]n.sá.tion *cf.* cóm.p[ə]n.sate
còn.d[ə]n.sá.tion còn.d[ɛ̀]n.sá.tion *cf.* con.d[ɛ́]nse

- Draw the brackets in for the underlying forms. Can we explain this?

9. Putting cyclicity in the model



10. Example: Chamorro Chung 1983; Crosswhite 1998

Austronesian language from Guam and Northern Marianas with 62,500 speakers
Complementary distribution: mid Vs in closed, stressed syllables; high Vs elsewhere

lápis	'pencil'	lapés + su	'my pencil'
dǽŋis	'candle'	dæŋés + su	'my candle'
hugándu	'play'	hùgandó+ŋa	'his playing'
malǽguʔ	'wanting'	màlægóʔ+mu	'your wanting'

Secondary-stressed vowels are high in these examples

tintáguʔ	'messenger'	tìntagóʔ+ta	'our (incl.) messenger'
mundóŋgu	'cow stomach'	mùnduŋgó+ŋa	'his cow stomach'

- But not in these (and cf. the unstressed examples). What do you think?

éttigu	'short'	èttigó+ŋa	'shorter'
inéŋŋuluʔ	'peeping'	inèŋŋuló?+hu	'my peeping'
óttimu	'end'	òttimó+ŋa	'his end'

- We also need to take care of these:

kwéntus	'to speak'	kwintús+i	'to speak to'
lókluk	'to boil'	luklók + ɲa	'its boiling'
sénsin	'flesh'	sinsén+ɲa	'his flesh'

11. Further evidence for interleaving phonology and morphology

Raffelsiefen 1996, 1999: many English affixes are selective about what they'll attach to

rándom	rándomìze	sálmon	sálmonìze	fóreign	fóreignìze	
síster	sísterìze	shépherd	shépherdìze	rhýthm	rhýthmìze	
corrúpt	*corruptize	ápt	*aptize	obscéne	*obscénize	
fírm	*firmize	políte	*polítize	ténse	*tensize	(1996, p. 194)

Kiparsky's interpretation: stress rules have already applied by the time the grammar tries to attach *–ize*.

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

suffix examples	*-al, -ous, -th, -ate, -ity, -ic, -ify, -ion, -ive, -ize*	*-ship, -less, -ness, -er, -ly, -ful, -some, -y, -ish*
stress shift?	p**á**rent *vs.* par**é**nt-al sp**é**cify *vs.* spec**í**f-ic	p**á**rent *vs.* p**á**rent-less c**á**reful *vs.* c**á**reful-ly
trisyllabic shortening?	ev[**oʊ**]ke vs. ev[**ɑ**]c-at-ive der[**aɪ**]ve vs. der[**ɪ**]v-at-ive	s[**oʊ**]l vs. s[**oʊ**]l-less-ness gr[**eɪ**]teful *vs.* gr[**eɪ**]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
prefix examples	*in-, con-, en-*	*un-, non-*
can bear main stress?	c**ó**n-template, **í**n-filtrate	-- (rarely)
obligatory assim. of nasal?	i**l-**egal, co**m**-prehend	u**n-l**awful, no**n**-plus
both		
attach to bound morph.?	caust-ic, con-flict	-- (rarely)
ordering	act-iv-at-ion-less-ness[2], non-in-com-prehens-ible[3]	
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 –*y*s) and of course there are exceptions…

13. 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 1982 and Mohanan 1986, who proposes 4 levels for English):

Level 1	WFRs	irregular inflection (tooth/teeth) "primary" derivational affixes (*-al*, *-ous*, *-ant*, *in-* etc.), including some Ø affixes
	Phon. rules (selected)	stress trisyllabic shortening (*opacity*) obligatory nasal assimilation (*illegal*) velar softening (*electricity*)
Level 2	WFRs	secondary derivational affixes (*-ness*, *-er*, *un-*, etc.) compounding (*blackbird*)
	Phon. rules	compound stress n → Ø / C__]# (*damning* vs. *damnation*) g → Ø / __ [+nas]# (*assigning* vs. *assignation*[4])
Level 3	WFRs	regular inflectional affixes (*-s*, *-ed*, *-ing*)
	Phon. rules	sonorant resyllabification is only optional __]V (*cycling*)
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.

[2] "the correspondingly predicted near-**activationlessness** of the reaction" (www.pnas.org/cgi/content/full/101/46/16198)
[3] "great cast, snappy dialogue, non-boring **non-incomprehensible** non-insane plotting" (www.thepoorman.net/archives/002732.html)
[4] though also some problematic cases like ?*assigner*. For a completely different view of all this, see Hay 2003.

- 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

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

Palatal and alveolar nasals and laterals contrast:

ka.**n**a	'grey hair'	po.**l**o	'pole'
ka.**ɲ**a	'cane'	po.**ʎ**o	'chicken'

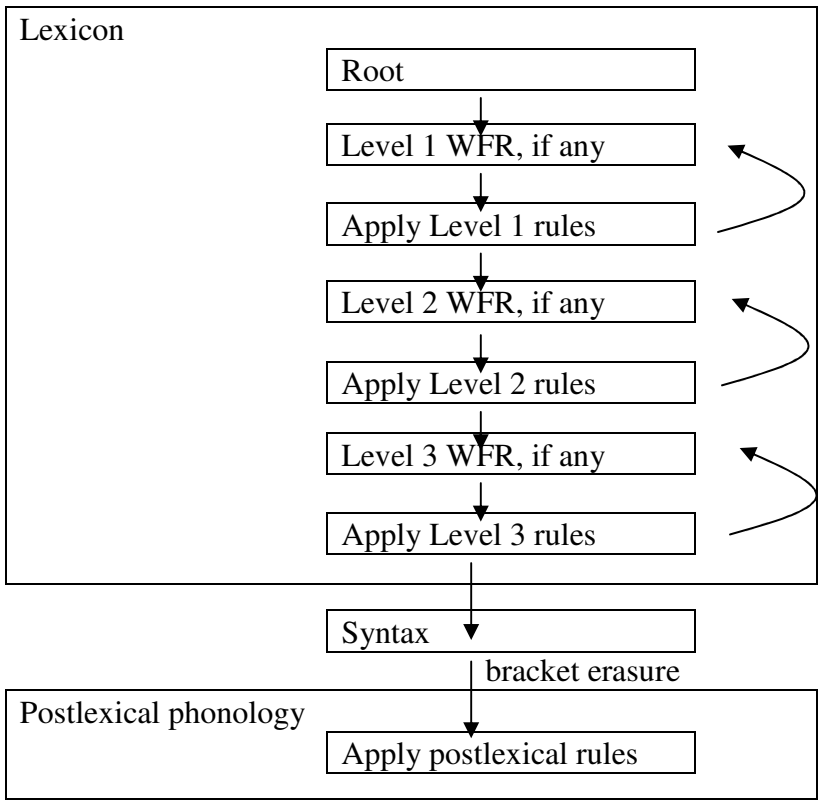
But the contrast is neutralized in some environments

dezðe**ɲ**+ar	'to disdain'	donθe**ʎ**+a	'maiden'
dezðe**ɲ**+oso	'disdainful'	donθe**ʎ**+a+s	'maidens'
dezðe**n**	'disdain (N)'	donθe**l**	'swain'

  - What about these forms—what can we conclude about levels in Spanish?

dezðe**n**+es	'disdain (N, plural)'	donθe**l**+es	'swains'

15. 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).

16. 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 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.

o Last quarter you learned about O-O correspondence (Benua 1997; Crosswhite 1998; Kenstowicz 2002; Burzio 1998; Steriade 2000...). Can it handle everything we've seen today?

o Let's discuss the Steriade 1999 paper you read.
  o Discuss the empirical advantages of Steriade's lexical conservatism approach
  o Are there any things we've seen today that Steriade's theory doesn't in itself handle?

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

We won't try to solve this question, 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…

to X	*Let him/her X!*	*'active instructive infinitive II'*	*she/he was Xing*	
halu**t**+a	halu**t**+koon	halu**t**+en	halu**s**+i	'want'
noe**t**+a	noe**t**+koon	noe**t**+en	noke**s**+i	'smudge (?)'
pie**t**+æ	pie**t**+køøn	pie**t**+en	pike**s**+i	'pitch'
filma**t**+a	filma**t**+koon	filma**t**+en	filma**s**+i	'film'
These show that the [t] above isn't part of the suffix:				
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'

o The data above suggest t → 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'

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

jok**e**+na	'river' essive sg.	jok**i**	'river' nom. sg.
mæk**e**+næ	'hill^{j} essive sg.	mæk**i**	'hill' nom. sg.
These suggest the above words end in /e/			
æit**i**+næ	'mother' essive sg.	æit**i**	'mother' nom. sg.
kahv**i**+na	'coffee' essive sg.	kahv**i**	'coffee' nom. sg.

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

ve**te**+næ	'water' essive sg.	ve**si**	'water' nom. sg.
kæ**te**+næ	'hand' essive sg.	kæ**si**	'hand' nom. sg.
yh**te**+næ	'one' essive sg.	yk**si**	'one' nom. sg.

o What's the problem in *vesi*?

Sanskrit "ruki" [5] (also Kiparsky 1973, pp. 61-)

s → ʂ / {r, u, k, i} __

da+dā+**s**i	'you give'	bi+bhar+**ʂ**i	'you carry'
kram+**s**ja+ti	'he will go'	vak+**ʂ**ja+ti	'he will say'

- How is this like Finnish?

b**i**sa	'lotus stalks'	v**iʂ**a	'poison'	ʂa**ʂ**	'six'
b**u**sa	'thicket, darkeness'	śī**rʂ**an	'head'	kā**ʂ**ṭa	'piece of wood'
bar**s**a	'tip'	pi**ʂ**	'crush'	bā**ʂ**pa	'tear'
k**i**salaja	'sprout'	ju**ʂ**	'enjoy'	bhā**ʂ**	'speak'
k**u**suma	'flower'	kar**ʂ**	'drag, plow'	**ʂ**ṭhīv	'spit'
b**ṛ**sī	'ascetic's seat'	śu**ʂ**	'dry'	la**ʂ**	'desire'
pi**s**	'move'	dvī**ʂ**	'hate'	ka**ʂ**	'scratch'
b**ṛ**saja	'mighty'	śi**ʂ**	'remain'		

ablaut	saːs	'instruct'	/s**as**+ta/ → s**i**sta→ [s**iʂ**+ʈa]	participle
V-deletion	gha**s**	'eat'	/ga+**gha**s+anti/ → dʒa+**k**s+anti→ [dʒa+**kʂ**+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 alternative theories, see Wolf; McCarthy 2003.

To sum up

We saw how to account for the following in Lexical Phonology

- The lexical vs. postlexical syndrome
- Cyclic effects
- Different levels of lexical rules

We talked a little about alternative accounts of these phenomena.

Next time: Some bigger-picture issues for the phonology-morphology interface.

- What regulates morphological affiliation?
- How broad is the candidate set (morphological selection, paradigm gaps)?

(both of these relate to some conceptual issues that some of you brought up for the Samoan reduplication homework)

Kiparsky 2000

References (see web version for next page)

Allen, Margaret. 1978. Morphological Investigations.. University of Connecticut.

Baković, Eric. 2011. Opacity deconstructed. *The Blackwell companion to phonology*. Blackwell.

Benua, Laura. 1997. Transderivational Identity: Phonological Relations between Words.. University of Massachusetts, Amherst.

Burzio, Luigi. 1998. Anaphora and soft constraints.. In Pilar Barbosa, Danny Fox, Paul Hagstrom, Martha McGinnis, & David Pesetsky (eds.), *Is the Best Good Enough? Optimality and Competition in Syntax*, 93–113. Cambridge, Mass.: MIT Press.

[5] 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, [ʂ], [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 [ʂ] in the post-*ruki* environment.