Markedness and liquid alternations in Korean:
Implications for the representation of ambisyllabicity

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I. Introduction: The liquid alternations

A. Phenomenon: The Korean liquid phoneme has the following surface realizations:

• [n] in *onset* position	/Lak+kwan/	[nak.k'wan]	'optimism'
	/hyŏp+Lo/	[hyŏm.no]	'narrow road'
• [l] in *coda* position	/muL/	[mul]	'water'
	/kaL-ta/	[kal.da]	'to change, exchange'
• [r] *intervocalically*	/k^hwæ+Lak/	[k^hwærak]	'pleasure, delight'
('[r]' represents a tap)	/saLam/	[saram]	'person'

Note: [l] and [r] never contrast in Korean.
- This shows that IDENT[LATERAL], which distinguishes them, must be low-ranking.
- The /L/ used here for the liquid phoneme in input forms has no theoretical significance; it is merely a notational shorthand for "either /l/ or /r/".

B. Question: What drives these alternations?

- Why is [n] an alternant of the liquid phoneme?
  - Note: Aside from onset position, /n/ and /L/ contrast

/mun/	[mun]	'door, gate'	≠	/muL/	[mul]	'water'
/tani-ta/	[tanida]	'to go back and forth'	≠	/taLi-ta/	[tarida]	'to iron'

- Why are surface liquids sometimes [l] and sometimes [r]?

C. Proposal:

➪ The liquid alternations are driven by high-ranking markedness constraints that restrict acceptable onsets and codas:
- Onsets must be *low in sonority* → [n]
- Codas must be *unreleased* → [l]

➪ Intervocalically, a liquid behaves neither as an onset nor as a coda
- An intervocalic liquid is *ambisyllabic*
- Ambisyllabic consonants are *structurally distinct* from onsets and codas
  → An ambisyllabic liquid is not subject to the constraints on onsets and codas
  → It therefore surfaces as [r], the unmarked liquid

II. Nasals in onset position

A. Relevant constraints:

(1) The universal *MARGIN/X hierarchy (Prince & Smolensky 1993):

*ONSET/GLIDE >> *ONSET/LIQUID >> *ONSET/NASAL >> *ONSET/OBSTRUENT
(The more sonorant a segment, the less harmonic a syllable onset it makes)

(2) Constraint compelling input liquids to surface as output liquids:

IDENT[LIQUID] Correspondents agree in their specification for [liquid]

B. Ranking: *ONS/GLIDE >> *ONS/LIQUID >> IDENT[LIQUID] , *ONS/NAS >> *ONS/OBST

(3) /Lak+kwan/ 'optimism' *ONS/LIQ >> IDENT[LIQ] , *ONS/NAS

a. lakk'wan	*!		
b. rakk'wan	*!		
☞ c. nakk'wan		*	*

➪ /L/ is realized as [n] in onset position because liquids are too sonorant to be good onsets.

III. Laterals in coda position

A. Background: In general, Korean requires coda consonants to be unreleased.

(4) Obstruent neutralization: glottal and continuancy features are neutralized in codas

t:	/kŏt-/	kŏt.-c'a	'let's collect'	*cf.*	kŏ.d-ŏ	'Collect!'
t^h:	/pat^h/	pat	'dry field'		pa.t^h-e	'in the field'
c^h:	/k'oc^h/	k'ot	'flower'		k'o.c^h-i	'flower-NOM'
s:	/os/	ot	'clothes'		o.s-ɨn	'clothes-TOP'
s':	/is'-/	it.-k'o	'exist and'		i.s'-ŏ	'I have it. (Exists.)'

(5) The constraint responsible (Iverson & Lee 1995:182-3; cf. Kim-Renaud 1974, 1986)

CODANONRELEASE Oral contact in syllable-final consonants may not be immediately released

➪ This constraint should apply to liquids as well as to obstruents.

• By definition, [r] (tap) can not be unreleased.

B. Ranking: { IDENT[LIQUID] , CODANONRELEASE } >> IDENT[LATERAL]

(6) /mur/ 'water' { IDENT[LIQ] , CODANONREL } >> IDENT[LAT]

☞	a. mul			
	b. mur		*!	*
	c. mun	*!		

(6') /mul/ 'water' { IDENT[LIQ] , CODANONREL } >> IDENT[LAT]

☞	a. mul			*
	b. mur		*!	
	c. mun	*!		

→ 'Richness of the base' in action: Because [l] and [r] do not contrast (i.e., (IDENT[LATERAL] is low-ranking), the right output form is selected regardless of which liquid the input contains.

➪ /L/ is realized as [l] in coda position because coda consonants must be unreleased.

IV. Intervocalic liquids: Ambisyllabicity and emergence of the unmarked

A. Where does the liquid surface as [r]? Only *intervocalically*.

- Intervocalic liquids must *not* count as *onsets*, or we would expect [n]

(7) /saLam/ 'person' *ONS/LIQ >> IDENT[LIQ] , *ONS/NAS (actual output: *saram*)

	a. sa.lam	*!		
	b. sa.ram	*!		
💣	c. sa.nam		*	*

- Intervocalic liquids must *not* count as *codas*, or we would expect [l]

(8) /saLam/ 'person' { IDENT[LIQ] , CODANONREL } >> IDENT[LAT]

💣	a. sal.am			(*)
	b. sar.am		*!	(*)
	c. san.am	*!		

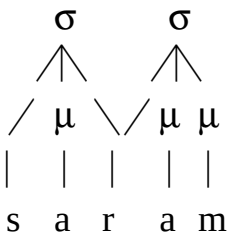
➪ Intervocalic liquids are *ambisyllabic* (cf. Kang 1991)

B. Intervocalic liquids and the representation of ambisyllabicity

The idea: The constraints *ONS/LIQUID, CODANONRELEASE do not apply to ambisyllabic liquids.

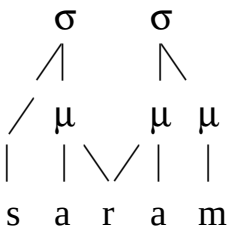
The implementation: What is the structure of an ambisyllabic liquid in Korean?

- First attempt: Double linking at the *syllabic* level



→ Problem: How is this [r] exempt from *ONS/LIQUID? Translating the "Linking Constraint" (Hayes 1986) into Optimality Theory is not straightforward (and maybe not desirable).

- Better attempt: Double linking at the *moraic* level



→ With this representation, ambisyllabic liquids are *structurally distinct* from onsets and codas.

This accounts for their distinct behavior.

➪ Speculation: Borowski, Itô, & Mester (1984) discuss ambisyllabic consonants in Danish, which share characteristics of both onsets and codas. In such a language, ambisyllabic consonants might instead be doubly linked at the syllabic level.

(9) Reformulating the onset/coda markedness constraints
→ These constraints do not apply to ambisyllabic consonants

*ONSET/LIQUID	An onset is not a liquid, where *onset* = pre-nuclear consonant directly dominated by syllable node
CODANONRELEASE	A coda is not released, where *coda* = post-nuclear moraic consonant

(10) The familiar syllable well-formedness constraints as alignment (Itô & Mester 1994)
→ These constraints are still relevant for ambisyllabic consonants

ONSET	Align(σ,L,C,L); every syllable has a consonant at its left edge
NOCODA	Align(C,L,σ,L); every consonant is at the left edge of a syllable

(11) A constraint against ambisyllabicity

*SHAREDMORA	Moras are not doubly linked (cf. CRISPEDGE: Itô & Mester 1994)

(12) An intervocalic liquid is *ambisyllabic*

/saLam/ 'person' { *ONS/LIQ , CODNREL , ID[LIQ] , NOCOD } >> *SHR-μ

a. sa.nam			*!		
b. sal.am				*!	
μ μ μ \ / | ☞ c. s a r a m					*

(13) An ambisyllabic liquid is [r]

/saLam/ 'person' IDENT[LIQ] >> *SHR-μ , {*LATERAL >> IDENT[LAT] }

μ μ μ \ / | a. s a n a m	*!	*		
μ μ μ \ / | b. s a l a m		*	*!	(*)
μ μ μ \ / | ☞ c. s a r a m		*		(*)

➪ [r] is the unmarked liquid in Korean
(cf. the complex-[Place] analysis of liquids in Walsh Dickey 1997)

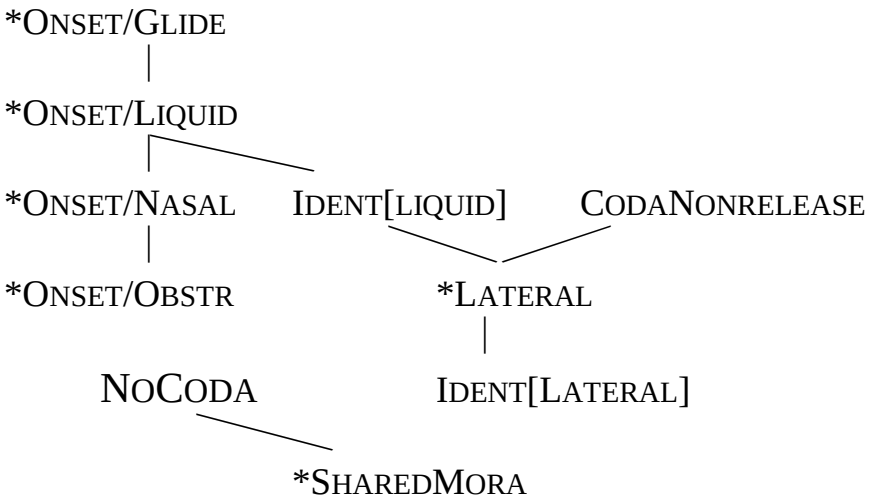
V. Conclusion: What drives the the liquid alternations in Korean?

➪ Markedness constraints apply to onsets, forcing [n], and to codas, forcing [l]

➪ Ambisyllabic liquids are structurally distinct from onsets and codas
- Ambisyllabicity in Korean is mora-sharing, not (directly) syllable-sharing

➪ Ambisyllabic liquids are unaffected by the onset/coda markedness constraints
- They stay liquids, because nothing compels violation of IDENT[LIQUID]
- They surface as [r], not [l], because [r] is less marked

➪ The final constraint ranking



References

Borowsky, Toni, Junko Itô, and Ralf-Armin Mester (1984). "The formal representation of ambisyllabicity: Evidence from Danish." *NELS* 14. Amherst: GLSA.

Cho, Young-Mee Yu (1988). "Korean assimilation." *WCCFL* 7:41-52.

Hayes, Bruce (1986). "Inalterability in CV phonology." *Language* 62:2, 321-352.

Itô, Junko, and Armin Mester (1994). "Reflections on CodaCond and Alignment." *Phonology at Santa Cruz*, vol. 3, 27-46.

Kang, Seok Keun (1991). "Moraic representations of ambisyllabicity: Evidence from Korean." *Studies in the Linguistic Sciences* 21:2, 89-100.

Kanno Hiroomi et al., eds., *Kosumosu tyô-wa ziten*, 2nd edition. Tokyo: Hakusuisha.

Kim-Renaud, Young-Key (1986). *Studies in Korean Linguistics*. Seoul: Hanshin Publishing Company.

Matsubara Takatoshi and Kim Yŏn-Sŏn (1994). *Kankokugo kôza I: Hatuon-hen*. Seoul: Hayangsæm.

Prince, Alan, and Paul Smolensky (1993). *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms., Rutgers University and University of Colorado, Boulder.

Walsh Dickey, Laura (1997). *The Phonology of Liquids*. PhD dissertation, University of Massachusetts.