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
  /kʰwae+Lak/ [kʰwærak] 'pleasure, delight'
  /saLam/ [sar am] '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
    /muŋ/ [muŋ] 'door, gate' ≠ /muL/ [mul] 'water'
    /taŋ-τa/ [taŋida] 'to go back and forth' ≠ /taL-i-ta/ [taɾida] '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]

- Intervocally, 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):
   \[ *_{\text{ONSET/GLIDE}} >> *_{\text{ONSET/LIQUID}} >> *_{\text{ONSET/NASAL}} >> *_{\text{ONSET/OBSTRUENT}} \]
   (The more sonorant a segment, the less harmonic a syllable onset it makes)

2. Constraint compelling input liquids to surface as output liquids:
   \[ \text{IDENT[LIQUID]} \]
   Correspondents agree in their specification for [liquid]

B. Ranking: \[ *_{\text{ONS/GLIDE}} >> *_{\text{ONS/LIQUID}} >> \text{IDENT[LIQUID]} , *_{\text{ONS/NAS}} >> *_{\text{ONS/OBST}} \]

3. /Lak+kwan/ ‘optimism’ \[ *_{\text{ONS/LIQUID}} >> \text{IDENT[LIQUID]} , *_{\text{ONS/NAS}} \]

\[
\begin{array}{|c|c|c|}
\hline
\text{a. lakk’wan} & *! & \hline
\text{b. ṭakk’wan} & *! & \hline
\text{c. Ṽakk’wan} & * & * \\
\hline
\end{array}
\]

\[ /L/ \] 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

\[
\begin{array}{lclcl}
\text{t: } /kōt-/ & kōt.-c’a & ‘let’s collect’ & \text{cf. } kō.d-ō & ‘Collect!’ \\
\text{tʰ: } /pātʰ/ & pāt & ‘dry field’ & \text{pa.tʰ-}e & ‘in the field’ \\
\text{cʰ: } /k’ocʰ/ & k’oṭ & ‘flower’ & \text{k’o.čʰ-}i & ‘flower-NOM’ \\
\text{s: } /os/ & oṭ & ‘clothes’ & \text{o.s-}i & ‘clothes-TOP’ \\
\text{s’: } /iš’-/ & iš.-k’o & ‘exist and’ & \text{i.š’-}ō & ‘I have it. (Exists.)’ \\
\end{array}
\]

   \[ \text{CODA NONRELEASE} \]
   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], CODA NONRELEASE \} >> IDENT[LATERAL]

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

<table>
<thead>
<tr>
<th></th>
<th>a. muļ</th>
<th>b. muŗ</th>
<th>c. mun</th>
</tr>
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<tbody>
<tr>
<td>-</td>
<td></td>
<td>*!</td>
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→ ‘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 intervocally.

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

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

<table>
<thead>
<tr>
<th></th>
<th>a. sa.lam</th>
<th>b. sa.ram</th>
<th>c. sa.nam</th>
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<td>*!</td>
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</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th></th>
<th>a. sal.am</th>
<th>b. sar.am</th>
<th>c. san.am</th>
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</thead>
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<tr>
<td>-</td>
<td></td>
<td>*!</td>
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[Intervocalic liquids are ambisyllabic] (cf. Kang 1991)
B. Intervocalic liquids and the representation of ambisyllabicity

**The idea:** The constraints ONSET/LIQUID, CODA NONRELEASE 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

  \[ \frac{\sigma}{\underbrace{\sigma}} \quad \underbrace{\sigma} \quad \frac{\mu}{\underbrace{\mu}} \quad \frac{\mu}{\underbrace{\mu}} \quad \frac{\mu}{\underbrace{\mu}} \]

  → Problem: How is this [r] exempt from ONSET/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

  \[ \frac{\sigma}{\underbrace{\sigma}} \quad \underbrace{\sigma} \quad \frac{\mu}{\underbrace{\mu}} \quad \frac{\mu}{\underbrace{\mu}} \quad \frac{\mu}{\underbrace{\mu}} \quad \frac{\mu}{\underbrace{\mu}} \]

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

  This accounts for their distinct behavior.

�性： 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

*CODA NONRELEASE*  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

*NO CODA*  Align(C,L,σ,L); every consonant is at the left edge of a syllable

(11) A constraint against ambisyllabicity

*SHARED MORA*  Moras are not doubly linked (cf. CRISPEDGE: Itô & Mester 1994)
(12) An intervocalic liquid is *ambisyllabic*

\[ /saLam/ \ 'person' \]

\[
\begin{array}{|c|c|c|}
\hline
\text{a. sa.nam} & & *! \\
\hline
\text{b. sal.am} & & *! \\
\hline
\text{c. s a r a m} & * & \\
\hline
\end{array}
\]

(13) An ambisyllabic liquid is \[ [r] \]

\[ /saLam/ \ 'person' \]

\[
\begin{array}{|c|c|c|}
\hline
\text{a. s a n a m} & *! & * \\
\hline
\text{b. s a l a m} & * & *! \\
\hline
\text{c. s a r a m} & * & * \\
\hline
\end{array}
\]

\[ [r] \text{ is the unmarked liquid in Korean} \]

(cf. the complex-[Place] analysis of liquids in Walsh Dickey 1997)

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

\[ [n] \] are marked, forcing [n], and to codas, forcing [l]

Ambisyllabic liquids are structurally distinct from onsets and codas

- Ambisyllabic 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

```
  *ONSET/GLIDE
   *ONSET/LIQUID
     *ONSET/NASAL  IDENT[LIQUID]  CODA NONRELEASE
     *ONSET/OBSTR  *LATERAL
       NOCODA  IDENT[LATERAL]
   *S HARE DMORA
```

References


