The Short Lifespan of Laryngeal Sonorants in Korean

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A class of *sonorant/vowel final verb roots*, “Fairy Roots”, shows seemingly disparate quirky patterns.

This pattern can be captured in a unified way with assuming underlying *floating features* and stratal OT.

The floating feature creates a laryngeal sonorant that is present only *at an intermediate level* of the derivation (Duke-of-York).

Accounts with simpler representations face severe problems.
Data
Laryngeal contrasts

Korean has a three-way distinction in terms of laryngeal contrast in obstruents

This contrast is neutralised in coda position

(1)  
a. /kal/ [kål] ‘Zacco platypus (which turns red when it is about to lay eggs)’
b. /kʰal/ [kʰål] ‘knife’
c. /k’al/ [k’al] ‘color’

(2)  
a. /pʲək/ [pʲək] ‘wall’
b. /puəkʰ/ [pᵘ.ɐk] ‘kitchen’
c. /pæk’/ [pæk] ‘outside’

Vowels and sonorants do not show such contrasts on the surface!
Vowel Fairy Roots

- Vowel final roots generally do not affect the plain obstruent initial suffixes (3-a) (4-a)
- Fairy roots idiosyncratically induce laryngeal contrasts onto these suffixes (3-b,c) (4-b,c)

(3)  
<table>
<thead>
<tr>
<th></th>
<th>Vowel</th>
<th>root</th>
<th>New Vowel</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>/na-ta/</td>
<td>→</td>
<td>[na.ta]</td>
<td>‘occur’</td>
</tr>
<tr>
<td>b.</td>
<td>/naʔ-ta/</td>
<td>→</td>
<td>[na.t’a]</td>
<td>‘get.better’</td>
</tr>
<tr>
<td>c.</td>
<td>/naʰ-ta/</td>
<td>→</td>
<td>[na.tʰa]</td>
<td>‘give.birth’</td>
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</table>

(4)  
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<tbody>
<tr>
<td>a.</td>
<td>/na-ko/</td>
<td>→</td>
<td>[na.ko]</td>
<td>‘occur’</td>
</tr>
<tr>
<td>b.</td>
<td>/naʔ-ko/</td>
<td>→</td>
<td>[na.k’o]</td>
<td>‘get.better’</td>
</tr>
<tr>
<td>c.</td>
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<td>→</td>
<td>[na.kʰo]</td>
<td>‘give.birth’</td>
</tr>
</tbody>
</table>
Sonorant Fairy Roots

Sonorant-final roots may be fairy roots 🧙‍♀️, as well.

However, they are more restricted (cf. Albright & Kang 2009):

(5) a. /al-ta/ → [al.ta] ‘know’
   b. /alʰ-ta/ → [al.tʰa] ‘suffer’ 🧙‍♀️

(6) a. /anʔ-ta/ → [an.t’a] ‘hug’ 🧙‍♀️
   b. /anʰ-ta/ → [an.tʰa] ‘do.not’ 🧙‍♀️

(7) /kamʔ-ta/ → [kam.t’a] ‘wind’ 🧙‍♀️
Puzzles
The inflectional affix -ə/-a/-jə optionally coalesces/ induces gliding with a preceding vowel (cf. Jun & Albright 2017)

(8) a. /o-a/ → [wa] ‘come.INFL’
    b. /pʰi-ə/ → [pʰjə] ‘blossom.INFL’
    c. /na-a/ → [na] ‘occur.INFL’
Blocking of gliding and coalescence

If this affix attaches to a fairy root \( \rho \), gliding and coalescence are blocked.

(9)  
\begin{align*}
\text{a. } & /\text{co}^h\text{-a}/ \rightarrow [\text{co.a}] \quad *[\text{cwa}] \quad \text{‘good.INFL’} \\
\text{b. } & /i^?\text{-}\text{ə}/ \rightarrow [i.\text{ə}] \quad *[j\text{ə}] \quad \text{‘tie.INFL’} \\
\text{c. } & /\text{na}^?\text{-a}/ \rightarrow [\text{na.a}] \quad *[\text{na}] \quad \text{‘get.better.INFL’} \\
\text{d. } & /\text{na}^h\text{-a}/ \rightarrow [\text{na.a}] \quad *[\text{na}] \quad \text{‘give.birth.INFL’}
\end{align*}
Gemination

Allomorph-less sonorant-initial affixes geminate, if attached to a fairy root.

(10)  
  a. /po-ni/ → [po.ni] ‘see.Q’
  b. /mək-ni/ → [mək.ni] ‘eat.Q’

(11)  
  a. /co^n-h-ni/ → [con.ni] ‘be.goodQ’
  b. /na^?-ni/ → [nan.ni] ‘get.better.Q’
  c. /na^n-h-ni/ → [nan.ni] ‘give.birth.Q’
Allomorph selection 1

Fairy roots unexpectedly select the elsewhere allomorph ‘sîmnita’

(12) a. /po/- {mnita, sîmnita} → [pom.ni.ta] ‘see. FORM’
b. /mək/-{mnita, sîmnita} → [mək.sîm.ni.ta] ‘eat. FORM’

(13) a. /co^h/-{mnita, sîmnita} → [co.sîm.ni.ta] ‘be.good. FORM’
b. /na^?-{mnita, sîmnita} → [na.sîm.ni.ta] ‘get.better. FORM’
Allomorph selection 2

More unexpected allomorph selection by fairy roots 🦇 can be observed with the elsewhere allomorph ‘ɨn’

(14)  
   a. /po/-{n, ɨn} → [pon] ‘seen’  
   b. /mək/-{n, ɨn} → [mə.kɨn] ‘eaten’

(15)  
   a. /coʰ/-{n, ɨn} → [co.ɨn] ‘been.good’ 🦇  
   b. /naʔ/-{n, ɨn} → [na.ɨn] ‘got.better’ 🦇
## Interim Summary

(16) Roots

<table>
<thead>
<tr>
<th></th>
<th>-C</th>
<th>coalescence</th>
<th>allomorphy</th>
<th>gemination</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>-C</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>V(^h)</td>
<td>-C(^h)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>V(^?)</td>
<td>-C(^?)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I</td>
<td>-C</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>I(^h)</td>
<td>-C(^h)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>n(^?)</td>
<td>-C(^?)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>n(^h)</td>
<td>-C(^h)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>m(^?)</td>
<td>-C(^?)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-C(^?)</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Proposal
Assumptions

- Statal OT (Kiparsky 2000, Bermúdez-Otero 2011)
- Floating Features (Zoll 1993, 1996)
We propose that a floating laryngeal feature $\mathcal{F}$ is a part of the underlying representation of fairy roots.

(17) /na$^{+sg}$/ ‘give.birth’  
(18) /na$^{+cg}$/ ‘get.better’  
(19) /na/ ‘occur’
Derivation

➤ We derive the three puzzles with a feeding/bleeding Duke-of-York gambit (Bermúdez-Otero 2001).

➤ in the first stratum the floating feature
   ★ docks to any affix
   ★ influences allomorph selection
   ★ blocks coalescences/gliding
   ★ induces gemination

➤ in the next stratum
   ★ the laryngeal specification is neutralised
Sample Illustration

coalessence blocked!
Analysis
Constraints

- **FLOAT**
  Assign * to every feature F that is not linked to a root node.

- **ALTER**
  Assign * to every epenthetic association line between elements having the same morphological color.

- **DEP**
  Assign * to every epenthetic root node.

- **\*V^{cg}**
  Assign * to every vowel root node linked to [+cg].

- **\*V^{sg}**
  Assign * to every vowel root node linked to [+sg].
**T₁. Stem-level**,

<table>
<thead>
<tr>
<th>O₁: co(+sg)a</th>
<th>MAXF</th>
<th>*FLOAT</th>
<th>DEP •</th>
<th>ALTER</th>
<th>*⇒([+sg][-sg])</th>
<th>*V.V</th>
<th>*V^h</th>
</tr>
</thead>
<tbody>
<tr>
<td>O²: co.a^h</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>O³: cwa</td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>O⁴: co.ha</td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O⁵: cw^h a^h</td>
<td></td>
<td></td>
<td></td>
<td>!</td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>O⁶: cwa^h</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

- *⇒([+sg][-sg])
  Assign * to every nucleus linked to opposite values of [±sg]
  (cf. Kehrein & Golston 2004)

- *V.V
  Assign * to adjacent heterosyllabic vowels
At the stem level the laryngeal contrast can survive on any suffixes, even if they are Vowel/Sonorant.
### Word-level Optimization

**$T_2$. Word-level**

<table>
<thead>
<tr>
<th>I: co.a^h</th>
<th>*V^h</th>
<th>MAX($\sigma$)</th>
<th>*V.V</th>
<th>MAXF</th>
</tr>
</thead>
<tbody>
<tr>
<td>O^1: co.a^h</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O^2: co.a</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>O^3: cwa</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

$\triangleright \text{MAX}($$\sigma$$): Assign * to every input syllable which is not present in the output

**At the word level the laryngeal specification is neutralised.**
Duke-of-York Gambit

\[(20)\]

\[
\begin{array}{lcc}
\text{co}^{+\text{sg}} \text{a} & \text{UR} & \text{ABC} \\
\text{coa}^h & \text{Feature Docking} & \text{ABD} \\
\text{cannot apply} & \text{Gliding} & - \\
\text{coa} & \text{Feature Deletion} & \text{ABC}
\end{array}
\]
T3. Stem-level,

<table>
<thead>
<tr>
<th>I: co^{+sg}-ni</th>
<th>S^h \rightarrow \mu</th>
<th>DEP \mu</th>
<th>*S^h</th>
</tr>
</thead>
<tbody>
<tr>
<td>O^1: co.n^h.i</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>O^2: con^h.i</td>
<td></td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

S^h \rightarrow \mu: Assign * to every laryngeally specified sonorant node which is not moraic

Assumption: Geminates are moraic, whereas coda consonants are not moraic (There is no evidence for moraicity of codas).
At the stem level, a geminate with laryngeal specification is optimal
### Stem level: Allomorph selection \{\textit{i}n, \textit{n}\}

#### T₄. Stem-level, allomorph selection

<table>
<thead>
<tr>
<th>(\text{l}: \text{co}^{+\text{sg}}{\textit{i}n, \textit{n}})</th>
<th>(\text{S}^h \rightarrow \mu)</th>
<th>(\text{DEP} \mu)</th>
<th>(\ast \text{V.V})</th>
<th>(\ast \text{V}^h)</th>
<th>(\ast \text{S}^h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{o}^1: \text{co.}^h \text{n})</td>
<td></td>
<td></td>
<td>(\ast)</td>
<td>(\ast)</td>
<td></td>
</tr>
<tr>
<td>(\text{o}^2: \text{con}^h)</td>
<td></td>
<td>(\ast!)</td>
<td></td>
<td></td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{o}^3: \text{con}^h_\mu)</td>
<td></td>
<td>(\ast!)</td>
<td></td>
<td></td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{h}^1: \text{co.}^h \text{n})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{h}^2: \text{con}^h)</td>
<td></td>
<td>(\ast!)</td>
<td></td>
<td></td>
<td>(\ast)</td>
</tr>
<tr>
<td>(\text{h}^3: \text{con}^h_\mu)</td>
<td></td>
<td>(\ast!)</td>
<td></td>
<td></td>
<td>(\ast)</td>
</tr>
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</table>

Gleim & Lee (Uni Leipzig)
### T₅. Stem-level, allomorph selection

<table>
<thead>
<tr>
<th></th>
<th>Sⁿ → μ</th>
<th>DEP μ</th>
<th>*V.V</th>
<th>*Vʰ</th>
<th>*Sʰ</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: co^{+sg} {mnita, s-imnita}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O¹: coˢⁿˌim.ni.ta</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O²: comʰˌni.ta</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>O³: comʰˌni.ta</td>
<td>*!</td>
<td></td>
<td></td>
<td>**</td>
<td></td>
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</tbody>
</table>
Could we be any simpler?
Argument for floating features

➢ Our representation:

(21) \( /\text{na}^{+\text{sg}}/ \)  
‘give.birth’
(22) \( /\text{na}^{+\text{cg}}/ \)  
‘get.better’
(23) \( /\text{na}/ \)  
‘occur’
Argument for floating features

➤ Our representation:

(21) /na^{+sg}/  ‘give.birth’
(22) /na^{+cg}/  ‘get.better’
(23) /na/  ‘occur’

➤ Alternative representation:

(24) /nah/  ‘give.birth’
(25) /naʔ/  ‘get.better’
(26) /na/  ‘occur’
However, Korean has no intervocalic /h/-deletion:

(27)  

a. /ihon/ → [i.hon] ‘divorce’  
   *[i.on]  

b. /coh-a-hæ/ → [co.a.hæ] ‘like.TR’  
   *[co.ha.hæ]  
   *[co.a.ae]
In this approach, morpheme specific phonology is derived by lexically indexed constraints (e.g. Benua 1997a,b)

Alternative Representation:

(28) /na\textsuperscript{1}/
‘give.birth’

(29) /na\textsuperscript{2}/
‘get.better’

(30) /na\textsuperscript{3}/
‘occur’
Argument against indexed constraints

➤ Alternative Representation:

(31) /na₁/  ‘give.birth’  (32) /na₂/  ‘get.better’  (33) /na₃/  ‘occur’

➤ Necessary Constraints:

*VC*

No plain obstruent in this context

*VC’*₁

No glottalised obstruent in this context

*VC*₂

No aspirated obstruent in this context

⋆ UNIFORMITY

No gliding/coalescence in this context

⋆ S → µ

Gemination of sonorants in this context

⋆ ...
Why can’t we be any simpler?

Argument against indexed constraints

Alternative Representation:

(31) /na\(^1\)/  ‘give.birth’
(32) /na\(^2\)/  ‘get.better’
(33) /na\(^3\)/  ‘occur’

Necessary Constraints:

⋆ *VC\(^1,2\): No plain obstruent in this context

In addition, allomorph selection should have access to the indices.
Argument against indexed constraints

Alternative Representation:

(31) /na₁/  ‘give.birth’
(32) /na₂/  ‘get.better’
(33) /na₃/  ‘occur’

Necessary Constraints:

★ *VC¹,²: No plain obstruent in this context
★ *VC’¹: No glottalised obstruent in this context
Argument against indexed constraints

- Alternative Representation:
  
  (31) /\text{na}^1/ \quad (32) /\text{na}^2/ \quad (33) /\text{na}^3/
  
  ‘give.birth’ \quad ‘get.better’ \quad ‘occur’

- Necessary Constraints:
  
  ★ \text{*VC}^{1,2} : No plain obstruent in this context
  ★ \text{*VC}^{1} : No glottalised obstruent in this context
  ★ \text{*VC}^{\text{h}2} : No aspirated obstruent in this context
Argument against indexed constraints

Alternative Representation:

(31) /na\(^1\)/ \quad \text{‘give.birth’}
(32) /na\(^2\)/ \quad \text{‘get.better’}
(33) /na\(^3\)/ \quad \text{‘occur’}

Necessary Constraints:

★ *VC\(^1,2\): No plain obstruent in this context
★ *VC’\(^1\): No glottalised obstruent in this context
★ *VC\(^h2\): No aspirated obstruent in this context
★ UNIFORMITY\(^1,2\): No gliding/coalescence in this context
Argument against indexed constraints

Alternative Representation:

(31) /na₁/ ‘give.birth’
(32) /na²/ ‘get.better’
(33) /na³/ ‘occur’

Necessary Constraints:

★ *VC₁,²: No plain obstruent in this context
★ *VC¹: No glottalised obstruent in this context
★ *VCʰ²: No aspirated obstruent in this context
★ UNIFORMITY¹,²: No gliding/coalescence in this context
★ S → µ¹,²: Gemination of sonorants in this context
Argument against indexed constraints

Alternative Representation:

(31) \( /\text{na}^1/ \)  
\( \text{‘give.birth’} \)

(32) \( /\text{na}^2/ \)  
\( \text{‘get.better’} \)

(33) \( /\text{na}^3/ \)  
\( \text{‘occur’} \)

Necessary Constraints:

- \( *\text{VC}^{1,2} : \) No plain obstruent in this context
- \( *\text{VC}'^{1} : \) No glottalised obstruent in this context
- \( *\text{VC}^{h2} : \) No aspirated obstruent in this context
- \( \text{UNIFORMITY}^{1,2} : \) No gliding/coalescence in this context
- \( S \rightarrow \mu^{1,2} : \) Gemination of sonorants in this context
- \( \ldots \)

In addition, allomorph selection should be able to have an access to the indices.
Argument against cophonology

In this approach, morpheme specific phonology is derived by morpheme specific rankings (e.g. Orgun 1996, 1998, Inkelas 1998)

Alternative Representation:

(34) /nah/  ‘give.birth’
(35) /naʔ/  ‘get.better’
(36) /na/   ‘occur’
Why can’t we be any simpler?

Argument against cophonology

Problem for cophonology

- Default Constraints ranking: $\text{MAX} \gg *\text{VhV}$
- Constraints ranking for $A$: $*\text{VhV} \gg \text{MAX}$

(37)

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>coh-A</td>
<td>co.A</td>
<td>$*\text{VhV} \gg \text{MAX}$</td>
</tr>
<tr>
<td>co.a-ha</td>
<td>co.a.ha</td>
<td>$\text{MAX} \gg *\text{VhV}$</td>
</tr>
<tr>
<td>co.a.ha-A</td>
<td>*co.a.a.æ</td>
<td>$*\text{VhV} \gg \text{MAX}$</td>
</tr>
</tbody>
</table>

Still, bleeding of coalescence remains mysterious.
Problem for cophonology

- Default Constraints ranking: \( \text{MAX} \gg \ast \text{VhV} \)
- Constraints ranking for A: \( \ast \text{VhV} \gg \text{MAX} \)

(37) \[
\begin{array}{ccc}
\text{Input} & \rightarrow & \text{Output} & \text{Ranking} \\
\text{coh-A} & \rightarrow & \text{co.A} & \ast \text{VhV} \gg \text{MAX} \\
\text{co.a-ha} & \rightarrow & \text{co.a.ha} & \text{MAX} \gg \ast \text{VhV} \\
\text{co.a.ha-A} & \rightarrow & \ast \text{co.a.a.ae} & \ast \text{VhV} \gg \text{MAX} \\
\end{array}
\]

- Still, bleeding of coalescence remains mysterious.
Conclusion
We found a new generalisation on how laryngeal contrast of Korean S/V verbal roots affects the paradigm.

We provided the evidence for a floating feature that in combination with strata accounts for the observed opacity:

- The floating feature docks to the affixes, which changes the laryngeal specification.
- The laryngealised S/V behaves differently for some processes and allomorph selection.
- At the next level, this contrast is neutralised, unlike on the obstruents, rendering the previous processes opaque.
Conclusions


Our analysis is also compatible with Yun (2008)’s proposal of stata in Korean and extends the noun-verb asymmetries observed by her.
Contact Information

Thank you!

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