Comparative consequences of the tongue root harmony analysis for proto-Tungusic, proto-Mongolic, and proto-Korean

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INTRODUCTION
Goal

• This paper examines the role of retracted tongue root ([RTR]) harmony for establishing areal and genetic relationships in Northeast Asia.
Synopsis

• Recent research:

• In this paper, we reinforce this conclusion:
  – arguing specifically against proposals that RTR harmony is secondary (e.g. Svantesson 1985 for Mongolic)
  – or that ATR is the dominant feature (Zhang and Dresher 2004).
Synopsis

• We also argue against the proposal of Starostin et al. (2003) that specific proto-families such as proto-Tungusic, and by extension proto-Altaic, should be reconstructed without vowel harmony (Joseph & Whitman 2013, to appear).
Synopsis

• We then compare the status of [RTR] harmony – as product of inheritance or contact – to the status of TR harmony as a contact-induced phenomenon in the Central Sudanic Zone (Clements & Rialland 2008).
Synopsis

• Then we turn back into NEAsian linguistic area
  – Within and outside of Altaic, [RTR] or height harmony appears to be an “eastern” trait, while palatal harmony appears to be a “western” trait in the region (cf. Janhunen 1981).

• We discuss whether KMT-style [RTR] harmony should be viewed as an innovation or a retention, and examine the particular issue of the Korean vowel inventory.
The argument for reconstructing [RTR] harmony in KMT

- Vowel harmony in Altaic
- ATR vs. RTR
- Basic Vowel correspondences in KMT
- PH > TRH in Mongolic & Korean?
- Reconstructing a harmonic contrast for Altaic
Vowel harmony in Altaic
Major types of vowel harmony in Altaic

- Major types of vowel harmony

<table>
<thead>
<tr>
<th>Type</th>
<th>Harmonic Feature</th>
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<tbody>
<tr>
<td>Palatal harmony <strong>PH</strong></td>
<td>[back] or [front]</td>
</tr>
<tr>
<td>Labial harmony</td>
<td>[labial (round)]</td>
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<tr>
<td>Height harmony</td>
<td>[high] or [low]</td>
</tr>
<tr>
<td>Tongue root harmony <strong>TRH</strong></td>
<td>[ATR]* or [RTR]**</td>
</tr>
</tbody>
</table>

*Advanced Tongue Root; **Retracted Tongue Root
Harmonic grouping of vowels

- **Turkish (PH)**
  Set A  i ü e ö
  Set B  ɨ u a o

- **Ewen (North Tungusic; TRH)**
  Set A  i ə u o
  Set B  ɪ a ʊ ɔ

(Novikova 1960; J Kim 2011; Kang & Ko 2011)
Harmonic grouping of vowels

- **Khalkha** (Eastern Mongolic; TRH)
  - Neutral i
  - Set A ə u o
  - Set B a ʊ ɔ
  
  (Svantesson 1985; Svantesson et al. 2005)

- **Middle Korean** (K-M Lee 1972)
  - Neutral i
  - Set A ə i u
  - Set B a ʌ ɔ
TR analyses of KMT

a. **Tungusic:**

b. **Proto-Tungusic:** Li 1996; Joseph & Whitman 2013; Ko 2012

c. **(Eastern) Mongolic:**

d. **Proto-Mongolic:** Ko 2011, 2012

e. **(Middle) Korean:**

f. **Across Altaic languages:** Vaux 2009; Ko 2012
Evidence in favor of TR analysis for non-Turkic varieties (1)

• **TR position in X-ray tracings**: the Set B vowels are produced with more retracted tongue root (Čenggeltei & Sinedke 1959; Buraev 1959; Novikova 1960)

• **Size of pharyngeal cavity** (Möömöö 1977, as cited in Svantesson et al. 2005; Novikova 1960; Li 1996)

• Greater muscular effort or tension associated with the active feature (Möömöö 1977)

• Impressionistic “voice quality” phenomena
Evidence in favor of TR analysis for non-Turkic varieties (2)

• **Formant frequency**
  - relatively **lower F1 values for Set A vowels**
  - Kang & Ko 2011 for Ewen and Buriat; Aralova et al. 2011 for Ewen; Svantesson 1985 for Khalkha and other eastern Mongolic; Svantesson et al. 2005; Lulich & Whaley 2012 for Oroqen

• **Phonemic distinction btwn velar vs. uvular Cs**
  - Nevins’s generalization: the distinction is conditioned
    • By [±ATR(RTR)], [±high], or [±low]
    • But NOT by [±back] (Nevins, 2010, pp. 92–93)
X-ray tracings for Ewen (Novikova 1960)

ATR-/-i/-

RTR-/-ɪ/-
From Ko’s pilot study. Cf. Svantesson et al. 2005

Khalkha

speaker m1

speaker f5

Comparative consequences of the TRH analysis for pTg pMg & pK
## Khalkha preliminary result

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*‘<’ and ‘>’ show which one has higher value; the number of the symbol ‘<’ or ‘>’ means p<001 if 3, p<.01 if 2, p<.05 if 1, p>.05 if none.*

ATR vs. RTR
ATR vs. RTR

- Are they two distinct features or two opposing values of a single feature? (Steriade 1995)
  – Still highly controversial

- The acoustics or gestural mechanisms have yet to be decisively established
  – Ladefoged & Maddieson (1996)
    - ATR (African) vs. “Pharyngealized” Vs (Ewen, Novikova 1960)
    - Acoustic correlates: F1 for ATR, F3 for Pharyngealized Vs?
    - F3 is irrelevant even for Ewen (Kang & Ko 2011)
Three gestural mechanisms?  
(B. L. Hall & Hall 1980: 207)

Set 1 (larger pharynx)  vs.  Set 2 (smaller pharynx)

a. advanced tongue root  vs.  retracted tongue root
b. advanced tongue root  vs.  neutral tongue root
c. neutral tongue root  vs.  retracted tongue root

• A survey of previous descriptions of a number of African and Mon-Khmer languages by Li (1996: 108-9) seem to support this.
Assumption

• Three tongue root positions
  Full feature specifications
  a. Advanced [+ATR, -RTR]
  b. Neutral [-ATR, -RTR]
  c. Retracted [-ATR, +RTR]

• Cf. [high] vs. [low]
Phonological criteria

- Phonological markedness (Rice, 2007, p. 80)

<table>
<thead>
<tr>
<th>Marked</th>
<th>Unmarked</th>
</tr>
</thead>
<tbody>
<tr>
<td>subject to neutralization</td>
<td>result of neutralization</td>
</tr>
<tr>
<td>unlikely to be epenthetic</td>
<td>likely to be epenthetic</td>
</tr>
<tr>
<td>trigger of assimilation</td>
<td>target of assimilation</td>
</tr>
<tr>
<td>remains in coalescence</td>
<td>lost in coalescence</td>
</tr>
<tr>
<td>retained in deletion</td>
<td>lost in deletion</td>
</tr>
</tbody>
</table>
[RTR] as the phonologically active feature in Altaic (Li 1996, Ko 2012, Joseph & Whitman 2013)

• Evidence from the behavior of neutral vowels in harmony

i. neutral vowels do not trigger harmony: the class of vowels found in suffixes attached to neutral roots--i.e., the default class--does not bear the active feature

ii. neutral vowels may block harmony: the feature that fails to propagate over neutral vowels is the active feature

iii. the inactive feature surfaces when a harmonic contrast is neutralized
A case study: [RTR] dominance in **Written Manchu**

• **The direction of merger/neutralization**
  – Merger: /*i, *ɪ*/ > /i/
  – Neutralization: /u, ʊ/ → [u] / [non-dorsal C]

• **Velar ~ Uvular alternation**
  – Widespread throughout Tungusic and Mongolic languages
    /k/ → [q]
    /x/ → [χ]
    /g/ → [g]
  – When adjacent to a neutral vowel (e.g., /i/), they surfaces as velars [k, x, g].
Vowel correspondence
## Vowel correspondences in Tungusic

*(Joseph & Whitman 2013)*

<table>
<thead>
<tr>
<th>TR</th>
<th><em>i</em></th>
<th><em>ɪ</em></th>
<th><em>ə</em></th>
<th><em>a</em></th>
<th><em>u</em></th>
<th><em>ʊ</em></th>
<th><em>o</em></th>
<th><em>ɔ</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benzing (1955)</strong></td>
<td><em>i</em></td>
<td><em>ɪ</em></td>
<td><em>ä</em></td>
<td><em>a</em></td>
<td><em>ü</em></td>
<td><em>u</em></td>
<td><em>ö</em></td>
<td><em>o</em></td>
</tr>
<tr>
<td>Ewen</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i/u</td>
<td>u</td>
<td>u/o</td>
<td>ɔ</td>
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<tr>
<td>Oroqen</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i/u</td>
<td>u</td>
<td>u/o</td>
<td>ɔ</td>
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<tr>
<td>Oroch</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i/u</td>
<td>u</td>
<td>ɔ</td>
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<tr>
<td>Udihe</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i/u</td>
<td>u</td>
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<tr>
<td>Nanai</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>u</td>
<td>ɔ</td>
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<td>i</td>
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<td>a</td>
<td>u</td>
<td>ʊ</td>
<td>u/o</td>
<td>ɔ</td>
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<tr>
<td>Manchu</td>
<td>i</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>u</td>
<td>ʊ/u</td>
<td>u(~ə)</td>
<td>ɔ</td>
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</table>
# Vowel correspondences in Mongolic

(Modified from Svantesson et al. 2005)

<table>
<thead>
<tr>
<th>TR (Ko 2011, 2012)</th>
<th>*i</th>
<th>*ə</th>
<th>*a</th>
<th>*u</th>
<th>*ʊ</th>
<th>*o</th>
<th>*ɔ</th>
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<tbody>
<tr>
<td>Poppe (1955)</td>
<td>*i</td>
<td>*e</td>
<td>*a</td>
<td>*ü</td>
<td>*u</td>
<td>*ö</td>
<td>*o</td>
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<td>Mongolian Proper</td>
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<td>Chakhar</td>
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Vowel correspondences in Korean  
(Ko 2012, based on Kwak 2003)

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<tr>
<th>TR</th>
<th>*i</th>
<th>*ɛ</th>
<th>*a</th>
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<th>*ʌ</th>
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<tr>
<td>OK (K-M Lee 1972)</td>
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In favor of TRH analysis

• None of the correspondences in the three families reveal any trace of PH
  – All rounded vowels are realized as back vowels.
  – Only exception: Kalmyk (and Oirat) in Mongolic

• For proto-Altaic, “majority-wins” principle will favor:
  – (i) reconstruction of VH
  – (ii) reconstruction of TRH

• There is a clear phonological route from TRH to PH, but none in the opposite direction (Vaux 2009, Ko 2012 ).
Conventional view: PH analysis

• However, the conventional view remains
  – (i) that VH in the proto-languages operated on a palatal contrast,
  – (ii) that the attested TRH in later varieties is the result of PH to TRH shift
    • Janhunen’s Vowel Rotation hypothesis for KMT (1981)
    • K-M Lee’s Korean Vowel Shift hypothesis (1964 et seq.)
    • Svantesson’s Mongolic Vowel Shift hypothesis (1985)
PH > TRH Shifts in Mongolic & Korean?

The Mongolic Vowel Shifts

Svantesson (1985 et seq.)
Gist

• Mongolic (Great) Vowel Shifts (MVS hereafter) (Svantesson 1985)
  – Old Mongolian: a palatal system (front-back contrast)
  – Mod. Khalkha: an RTR system (tongue root contrast)
    → Thus, a palatal-to-RTR shift

• Our view
  – Old Mongolian: an RTR system
  – Thus, no great vowel shift
    • Cf. Mod. Kalmyk/Oirat palatal system
Pre-modern Mongolic vowel system

• Proto-Mongolic (Janhunen 2003: 4)
  *i    *ü    *u
  *ö    *o
  *e    *a

• Old Mongolian (Svantesson et al. 2005:111)
  Front    Back
  High      i    y    u
  Nonhigh   e    ø    a o o
Old Mongolian: a palatal system?

• An assumption that has never been proven to be true
  – ’Phags-pa Mongolian
    • Not suitable for a reliable reconstruction (Hattori 1975:16ff)
    • E.g., “no one-to-one correspondence between Middle Mongolian /ü/ in ’Phags-pa and Written Mongolian /ü/” (Vovin 2000:65)
  – “It would be more reasonable to analyze Mongolian vowels based on 15th c. Korean vowels since the latter is more convincing.” (J. Kim 1993:50)
MM-Chinese correspondence

• Hattori (1975)
  – “It is more likely that Middle Mongolian had a vowel harmony of ‘open-narrow’ type (= TR type)”

• In the transcription of the Secret History of the Mongols into Chinese characters
  – MM ü – Chinese u
    • /gü/ (or /kü/) 古[ku²] 估[ku²] 沽[ku¹,²] 話[ku²,³]
    • /kü/ 枯[k’u¹] 窟[k’u?²]
  – Rationale:
    • The transcription was made based on Northern dialect, maybe Beijing dialect (by assumption).
    • 14th c. Pekingese had the distinction between [u][u?] and [y][y?].
Modern Mongolic vowel systems

Khalkha: i u u e o a o

Monguor: i u e o a o

Dagur: i u ø a o

Kalmyk: iy y u e ø o ø a
MVS (1): Kalmyk/Oirat type

• Kalmyk and Oirat

= OM palatal system
MVS (2): Monguor type

- Monguor, Santa, Bonan, Moghol
MVS (3): Mongolian type

- Mongolian, Buriat, Khamnigan, Shira Yugur, Kangjia
MVS (4): Dagur type

(1) *Old Mongolian*

(2) *Pharyngealization*

(3) *Velarization*

(4) *Polarization*

(5) *Dagur*
Problems of the MVS

• Based on an assumption yet to be proven
  – “It is generally assumed that OM (and Proto-Mongolic) had palatal (back~front) vowel harmony, and we will also make this assumption. There is, however, only incomplete support for this in the sources.” (Svantesson et al. 2005:113)

• No internal motivation
  – “Velarization and pharyngealization are not conditioned by the phonological environment, and have no obvious internal motivation.” (Svantesson et al. 2005:178)
Velarization

• Front Vs are assumed to move backward.
  – A violation of Labovian Principles of vowel shifting

Three principles of vowel shifting (Labov 1994:116)
In chain shifts,
  PRINCIPLE I  long vowels rise.
  PRINCIPLE II  short vowels fall.
  PRINCIPLE II_A the nuclei of upgliding diphthongs fall.
  PRINCIPLE III back vowels move to the front.

• Velarization alone cannot explain the emergence of the phonemic velar-uvular distinction in, e.g., Monguor and Santa
Majority wins

• Reconstruction of OM vowels

**Sound correspondence** (cf. Svantesson *et al.* 2005: 180)

<table>
<thead>
<tr>
<th>Language</th>
<th>a</th>
<th>o</th>
<th>u</th>
<th>e</th>
<th>o</th>
<th>u</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khalkha</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>e</td>
<td>o</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Chakhar</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>ə</td>
<td>o</td>
<td>u</td>
<td>i, i</td>
</tr>
<tr>
<td>Baarin</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>ə</td>
<td>o</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Monguor</td>
<td>a</td>
<td>o</td>
<td>u, o</td>
<td>i, e</td>
<td>o, u</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Bonan</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>ə</td>
<td>o</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Santa</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>ie, ə</td>
<td>o</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Moghol</td>
<td>a, o</td>
<td>o</td>
<td>u</td>
<td>e</td>
<td>o</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Buriat</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>e</td>
<td>u</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Khamnigan</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>e</td>
<td>u</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Dagur</td>
<td>a</td>
<td>o</td>
<td>o</td>
<td>ə</td>
<td>u</td>
<td>u</td>
<td>i</td>
</tr>
<tr>
<td>Kalmyk</td>
<td>a</td>
<td>o</td>
<td>u</td>
<td>e</td>
<td>ø</td>
<td>y</td>
<td>i</td>
</tr>
</tbody>
</table>

**Reconstruction**

Old Mongolian    *a*    *ɔ*    *u*    *ə*    *o*    *u*    *i*
Economy (1)

An RTR analysis

1 rule: RTR → Pal

Comparative consequences of the TRH analysis for pTg pMg & pK

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Economy (2)

A palatal analysis

3 rules: Pal $\rightarrow$ RTR
Naturalness: Vaux (2009)

• **Palatal-to-TR shift** (Svantesson 1985)
  – No known phonetic principles
  – No known attested cases (except Mongolic)

• **TR-to-palatal shift** (a reverse shift)
  – Phonetically grounded
  – Attested across languages all over the world
Phonetic grounds for TRH > PH

• Articulation (Lindau 1979, Archangeli & Pulleyblank 1994)
  – TR movement entails TB movement up and forward (not vice versa)

• Perception
  – Kiparsky (2003: 335): “vowel shifts are the result of a tendency to maximize perceptual distinctness”

• Phonologization (Hyman 1976) of a secondary, redundant feature

<table>
<thead>
<tr>
<th>Articulation</th>
<th>Perception</th>
<th>Shift</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB forward</td>
<td>F2</td>
<td>TRH &gt; PH</td>
<td>OM &gt; Kalmyk (Ko 2011)</td>
</tr>
<tr>
<td>TB up</td>
<td>F1</td>
<td>TRH &gt; height</td>
<td>MK &gt; EModK (Ko 2010)</td>
</tr>
</tbody>
</table>
Naturalness: Vaux (2009)

- Palatal-to-TR shift (Svantesson 1985)
  - No known phonetic principles
  - No known attested cases

- TR-to-palatal shift (a reverse shift)
  - Phonetically grounded:
    - TB movement is concomitant with TR movement (Lindau 1975; Archangeli & Pulleyblank 1994)
    - Attested in e.g., Somali, Louisiana English
    - Explains the Southwest Turkic voicing
    - Simplification/Enhancement of the perceptability (F2 difference)

- Maximal distribution of the back vowels
Attested cases of TRH > PH

• Vaux (2009)
  – Fronted realization of Somali [+ATR] vowels
  – /u/-fronting in Louisiana English
  – Southwest Turkic voicing:
    • Voiceless stops became voiced before front Vs (< ATR Vs)

• Calabrese (2000)
  – Vowel fronting in Altamura (a Romance)
Historical development of the Mongolic vowel systems

Ko (2011, 2012)
Khalkha type

• No shift (except for the fronting of *ə)

<table>
<thead>
<tr>
<th>OM</th>
<th>Khalkha</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>u</td>
<td>u</td>
</tr>
<tr>
<td>ə</td>
<td>e</td>
</tr>
<tr>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>
Monguor type

• Merger by RTR neutralization (No velarization)

OM

Monguor

i  u

u

e  o

a  c

i  u

e  o

a

– The same type of merger is also widely attested in other Altaic languages such as Tungusic (e.g., Manchu) and Korean
Dagur type

• Merger by height neutralization

- /u/ = [-low, -RTR] vs. /ɔ/ = [+low, +RTR]
- → Both are “contextually” unmarked.
Kalmyk/Oirat type

• RTRH > PH shift (an innovation)

OM

Kalmyk

– A reinterpretation (reanalysis, Ko 2012) of the harmonic feature
– Phonetically grounded shift: $[\alpha \text{ RTR}] \rightarrow [\alpha \text{ dorsal}]$ (Vaux 2009)
– Possibly due to Turkic influence (cf. Kögjiltü 1982)
  • Cf. Kazakh: reported as an RTR system (Vajda 1994)
Development of Mongolic vowel systems

Dagur (Type III)
[coronal] > [labial] > [RTR]

Loss of [low]

Old Mongolian
[coronal] > [labial] > [RTR] > [low]

Promotion of [low]

Khalkha (Type I)
[coronal] > [low] > [labial] > [RTR]

RTR-to-dorsal shift

Kalmyk-Oirat (Type IV)
[coronal] > [low] > [labial] > [dorsal]

Mongguor (Type II)
[coronal] > [low] > [labial]

Loss of [RTR]
The Korean Vowel Shift

Ki-Moon Lee (1964 et seq.)
Gist

• Korean Vowel Shift
  – “Documentary evidence suggests that a significant phonological change – a “Korean Vowel Shift,” as it has been called – took place between the 13th and 15th centuries. The evidence for the change comes primarily from Mongolian loanwords.” (KM Lee & Ramsey 2011:94)

• The proposed KVS hypothesis is untenable
  – Mongolian loanwords do not support the hypothesis
Korean Vowel Shift

• Old Korean had a ‘palatal’ system
• MK vowel harmony is based on OK vowel system
  – = “Discrepancy” between vowel system and vowel harmony
• How is this possible?
  – Mediated by the proposed KVS

Old Korean

<table>
<thead>
<tr>
<th>i</th>
<th>ü</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>ä</td>
<td>·</td>
<td>o</td>
</tr>
</tbody>
</table>

Early Middle Korean

<table>
<thead>
<tr>
<th>i</th>
<th>ü</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>·</td>
<td>o</td>
</tr>
</tbody>
</table>

Late Middle Korean

<table>
<thead>
<tr>
<th>i</th>
<th>i</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>·</td>
<td>o</td>
</tr>
</tbody>
</table>

Comparative consequences of the TRH analysis for pTg pMg & pK
Old Korean

|i  ü  u

1

ä  a
Early Middle Korean

\[
\begin{align*}
&\text{i} \rightarrow \text{ü} \\
&\text{e} \rightarrow \text{œ} \\
&\text{a}
\end{align*}
\]
Late Middle Korean

\[
\begin{array}{c}
\text{l i}
\\
\text{ i}
\\
\text{ u}
\\
\text{ e}
\\
\text{ o}
\\
\text{ a}
\\
\cdot
\\
\Rightarrow^8
\\
\emptyset
\end{array}
\]
Empirical evidence

• Mongolian loanwords transcribed into Korean in
  – Pŏnyŏk Pak T’ongsa 跋譯朴通事 (1517)
  – Hunmong chahoe 訓蒙字會 (1527)

• Jīlín lèishì 鶴林類事 ‘Assorted matters of Jīlín’
  – 350 words and phrases
    • 天1曰2漢捺3
    • ‘sky’1 is called2 ‘[the Korean word]’3 (LMK 하늘)

Chinese pronunciation
Mongolian loanwords in MK

![Transcription Table]

- **Examples** *(KM Lee 1964, 1972, 2011:96ff)*

<table>
<thead>
<tr>
<th>M~K</th>
<th>Mong</th>
<th>Kor</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>ü~ ⊙</td>
<td>üüreng</td>
<td>uuren</td>
<td>‘dark brown’ <em>(Pak. I, 63r)</em></td>
</tr>
<tr>
<td>ö~ ⊙</td>
<td>ögsin</td>
<td>waqcin</td>
<td>‘old wild falcon’ <em>(Hun. I, 15 v)</em></td>
</tr>
<tr>
<td>u~ ⊙</td>
<td>bayudal</td>
<td>paatal</td>
<td>‘military camp’ <em>(Hun. II, 8 r)</em></td>
</tr>
<tr>
<td>o~ ⊙</td>
<td>olang</td>
<td>oran</td>
<td>‘belly-band, girth’ <em>(Pak. I, 30r)</em></td>
</tr>
</tbody>
</table>
Mongolian loanwords (KM Lee 2011:94)

• “Why was the Korean vowel ṭ̣ equated to a front vowel?”
  – “Ṭ̣ was not a back vowel, but rather a front vowel, *ü, which moved to the back of the mouth by the 15th century.” (KM Lee 2011:94)

• “Similarly, ㅓ represented the Mongolian front vowel e and therefore must itself have been a front vowel *e that only later became [ə].”

MK transcription of 13th century Mongolian vowels (K-M Lee 1964)

<table>
<thead>
<tr>
<th>OM</th>
<th>i</th>
<th>e</th>
<th>a</th>
<th>ü</th>
<th>ö</th>
<th>u</th>
<th>o</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK</td>
<td>ṭ</td>
<td>ṭ̣</td>
<td>ṭ̣</td>
<td>ṭ̣</td>
<td>ṭ̣</td>
<td>ṭ̣</td>
<td>ṭ̣</td>
</tr>
</tbody>
</table>

\[ \text{i} \rightarrow \text{ṭ̣} \rightarrow \text{u} \]
\[ \text{e} \rightarrow \text{ḍ̣} \rightarrow \text{ə} \]
\[ \text{a} \rightarrow \text{ḍ̣} \rightarrow \text{ə} \]
Jīlín lèishì 鳥林類事 (KM Lee 2011:94ff)

- LMK /ʌ/ < EMK */ɔ/
  - 河屯 ‘one’ (LMK *hʌtan *হু ঠুন), 末 ‘horse’ (LMK mʌl মল)
  - Yuan-period Chinese: 河 *xɔ 末 *mɔ

- LMK /ɨ/ < EMK */ə/
  - 黑根 ‘big’ (LMK khɨn কৃন < *hikin)
  - Yuan-period Chinese: 黑 *xəj 根 *kən

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>ü</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparative consequences of the TRH analysis for pTg pMg & pK
Problems of the KVS (a summary)

• Provides no link to the description in Hunminjeongeum Haerye
• Discrepancy between harmony and system?
• Cannot be reconstructed by the comparative method (Hattori 1975)
  – No traces of PH in modern systems
• Lack of phonetic motivations (S-s Oh 1998)
• A counterexample to the typology of vowel shifting (Labov 1994)
• ‘Arae a’: a low unrounded vowel?
Problems of the KVS (cont.)

- Adequacy of the proposed documentary evidence?
  - Simply insufficient (Martin 2000, Vovin 2000)
  - Only partial support for the whole shifts
  - Different views on Jīlín lèishì
- Wrong predictions (Hattori 1975, Martin 2000)
- Inconsistent with Kor-Jap V correspondences
  - Frellesvig & Whitman (2005)
- Incompatible with OK vowel system
  - Reconstruction by Ito’s (2007:267)
Comparative Method

• No modern reflexes of the proposed front-back vowel contrast (cf. Hattori 1975:12)

Sound correspondence in initial syllable (based primarily on Kwak 2003)

<table>
<thead>
<tr>
<th>Middle Korean</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i</td>
<td>a</td>
<td>u</td>
<td>o</td>
</tr>
<tr>
<td>Northeast</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i</td>
<td>a</td>
<td>u</td>
<td>o</td>
</tr>
<tr>
<td>Central</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i</td>
<td>a</td>
<td>u</td>
<td>o</td>
</tr>
<tr>
<td>Southeast</td>
<td>i</td>
<td>i</td>
<td>a</td>
<td>i</td>
<td>a</td>
<td>u</td>
<td>o</td>
</tr>
<tr>
<td>Southwest</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i</td>
<td>a</td>
<td>u</td>
<td>o</td>
</tr>
<tr>
<td>Cheju</td>
<td>i</td>
<td>ə</td>
<td>a</td>
<td>i</td>
<td>ə</td>
<td>u</td>
<td>o</td>
</tr>
</tbody>
</table>

Reconstruction: *i  *ə  *a  *i  *ə  *u  *o
RTR-RTR analysis

MK transcription of 13th century Mongolian vowels (K-M Lee 1964)

<table>
<thead>
<tr>
<th>OM</th>
<th>i</th>
<th>e</th>
<th>a</th>
<th>ü</th>
<th>ö</th>
<th>u</th>
<th>o</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK</td>
<td></td>
<td></td>
<td></td>
<td>T</td>
<td>-</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

- OM (RTR system)

< i > i  < ü > u  
< u > u
< e > ʃ  < ö > o
< a > a  < o > ɔ

- MK (RTR system)

< | > i  < - > ʃ  < T > u
< ʃ > ʃ  < - > o
< | > ʃ
< | > a

Comparative consequences of the TRH analysis for pTg pMg & pK

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KVS-Conclusion

• The Korean Vowel Shift hypothesis is primarily based on the PH analysis of Old Mongolian.
• If the RTR analysis of OM is correct, there is no reason to believe that Old and Early Middle Korean had a palatal system.
• The loanword data are better explained under an RTR-RTR analysis.
Proto-Altaic (Poppe 1960: 92)

<table>
<thead>
<tr>
<th></th>
<th>[front]</th>
<th>[back]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[-round]</td>
<td>[+round]</td>
<td>[-round]</td>
</tr>
<tr>
<td>[closed]</td>
<td>i</td>
<td>y</td>
</tr>
<tr>
<td>[middle]</td>
<td>e</td>
<td>ø</td>
</tr>
<tr>
<td>[open]</td>
<td>ε</td>
<td></td>
</tr>
</tbody>
</table>
TR(H)-related innovations assuming proto-Altaic
Turkic shift: a hypothesis (Ko 2012)

Proto-Altaic: [low] > [coronal] > [RTR] > [labial]  (= Proto-Tungusic)

[low] > [coronal] > [dorsal] > [labial]  (reanalysis)

Proto-Turkic: [low] > [dorsal] > [labial]  (fusion)
Secondary [RTR] harmony in pT?

• Starostin, Dybo, & Mudrak 2003
  – proto-Tungusic was non-harmonic
  – Tungusic languages acquired PH from Mongolic
Starostin et al.’s 6-vowel inventory for proto-Tungusic

*ɪ  *ü  *u

*ɛ  *o

*a
Co-occurrence restrictions

• *a and *o on the one hand, and *e on the other, cannot co-occur in stems
• *o is restricted to the initial syllable
• NO *o...u
• NO *ü...u
Comparison of Starostin et al.’s pTg high vowels to the traditional reconstruction

<table>
<thead>
<tr>
<th>TR</th>
<th>Benzing</th>
<th>Starostin et al.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*i</td>
<td>*i</td>
<td>*i</td>
</tr>
<tr>
<td>*ĩ</td>
<td>*ĩ</td>
<td>*i</td>
</tr>
<tr>
<td>*u</td>
<td>*ũ</td>
<td>*ü</td>
</tr>
<tr>
<td>*œ</td>
<td>*u</td>
<td>*ũ</td>
</tr>
<tr>
<td>*o</td>
<td>*ö</td>
<td>*u</td>
</tr>
</tbody>
</table>
Deriving the harmonism of daughter languages

- *a, *o > “back” vocalism
- *e > “front” vocalism
- *ü > “front” vocalism
  - EXCEPT: {ü, a} or {ü, o} > “back”
- *i and *u in any combination (without other vowels) > “back” vocalism
Do these stipulations work?

• Testing predictions regarding *ü
  – *ü in combination any other high vowels should yield “front” vocalism

This works in some cases, such as:
# Proto-Tungusic *xürgü ‘tail’

<table>
<thead>
<tr>
<th>Language</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewen</td>
<td>[irgě]</td>
</tr>
<tr>
<td>Ewenki</td>
<td>[irgi]</td>
</tr>
<tr>
<td>Negidal</td>
<td>[iːɣi] ~ [idgi]</td>
</tr>
<tr>
<td>Oroqen</td>
<td>[irgi]</td>
</tr>
<tr>
<td>Ewenke</td>
<td>[igːə]</td>
</tr>
<tr>
<td>Oroch</td>
<td>[igːi]</td>
</tr>
<tr>
<td>Udihe</td>
<td>[igi]</td>
</tr>
<tr>
<td>Nanai</td>
<td>[xujgu]</td>
</tr>
<tr>
<td>Ulcha</td>
<td>[xudʒu]</td>
</tr>
<tr>
<td>Orok</td>
<td>[xudu]</td>
</tr>
</tbody>
</table>
## Proto-Tungusic *silkü- ‘to wash’

<table>
<thead>
<tr>
<th>Language</th>
<th>Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewen</td>
<td>[hilqă-] ~ [ɪlqă-] ~ [selqa-] ~ [helka-] ~ [hilkă-] ~ [hɪlkɔ-]</td>
</tr>
<tr>
<td>Ewenki</td>
<td>[silki-] ~ [hilki-] ~ [jilki-]</td>
</tr>
<tr>
<td>Negidal</td>
<td>[sɪlkɪ-]</td>
</tr>
<tr>
<td>Oroqen</td>
<td>[ʃɪlkɪ-]</td>
</tr>
<tr>
<td>Ewenke</td>
<td>[ʃɪx:ɪ-]</td>
</tr>
<tr>
<td>Oroch</td>
<td>[sik(:)i-]</td>
</tr>
<tr>
<td>Udihe</td>
<td>[siki-]</td>
</tr>
<tr>
<td>Nanai</td>
<td>[sɪlqɔ-]</td>
</tr>
<tr>
<td>Ulcha</td>
<td>[siltfʊ-]</td>
</tr>
<tr>
<td>Orok</td>
<td>[siltfɪ-] (: PERF [siltu-xa-])</td>
</tr>
</tbody>
</table>
Do these stipulations work?

• Testing predictions regarding *i and *u
  – in stems with no other vowels, “back” vocalism is predicted

Again, this works in some cases, such as:
Proto-Tungusic *úni- ‘small river, brook’

<table>
<thead>
<tr>
<th>Language</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oroch</td>
<td>[ʊŋi] ~ [ɔŋi]</td>
<td>‘small river; Anjuy river’</td>
</tr>
<tr>
<td>Udihe</td>
<td>[uŋi]</td>
<td>‘Anjuy river’</td>
</tr>
<tr>
<td>Nanai</td>
<td>[ɔŋi]</td>
<td></td>
</tr>
<tr>
<td>Ulcha</td>
<td>[ʊŋi] ‘brook’; [ʊŋa] ‘spring’</td>
<td></td>
</tr>
<tr>
<td>Orok</td>
<td>[uŋi] ‘river’; [ʊŋa] ~ [ʊŋaŋa] ‘small river, tributary’</td>
<td></td>
</tr>
</tbody>
</table>
Proto-Tungusic *gusi ‘eagle’

<table>
<thead>
<tr>
<th>Language</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewen</td>
<td>[gusə-tə] ~ [guhi-tə] ~ [guhə-tə]</td>
</tr>
<tr>
<td>Ewenki</td>
<td>[gus] ~ [gusi-kə:n] ~ [guhi-kə:n]</td>
</tr>
<tr>
<td>Negidal</td>
<td>[gusi-xa:n] ~ [gusi-kan]</td>
</tr>
<tr>
<td>Oroch</td>
<td>[gusi]</td>
</tr>
<tr>
<td>Nanai</td>
<td>[gusi]</td>
</tr>
<tr>
<td>Ulcha</td>
<td>[gusi]</td>
</tr>
<tr>
<td>Orok</td>
<td>[gusi]</td>
</tr>
</tbody>
</table>
Other sorts of failures:

• Starostin et al.’s *u…ü > “front” vocalism, but the observed vowel reflexes do not match their *ü

• Generally, the distribution of their *ü is not free as stated: occurs overwhelmingly in words that develop “front” vocalism; combinations with “back” vowels *a and *o are all problematic
observations:

• proto-Tungusic cannot be reconstructed without (TR) harmony

• Starostin et al.’s 6-vowel inventory is unworkable, regardless of the type of harmony assumed
RTRH as an inherited trait?
RTR harmony as an inherited trait

• Question: **IF** RTR harmony in KMT languages is inherited from a shared ancestor, what should this look like?

  – e.g., do we expect cognate vocabulary to belong to the same harmony class in all descendants?

  Not necessarily.
Consider the case of an established clade such as Tungusic:

• some languages have lost RTR harmony altogether (Manchu dialects)
• some languages attest pervasive but (so far?) unpredictable shifts from one class to another (Udihe)
• some lexical items appear to go back to original doublets (one form in each harmony class, aka ‘isotopes’)
## ATR words often shift to RTR in Udihe

<table>
<thead>
<tr>
<th>TR version of Benzing’s pTg</th>
<th>*sə̆ːksəʔ? *sə̆ːgsəʔ ‘blood’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewen</td>
<td>həːs ‘dried and hardened blood’</td>
</tr>
<tr>
<td>Ewenki</td>
<td>sə̆ːksə ~ sə̆ːhsə ~ ʃəːwʃə ~ ʃəːhə</td>
</tr>
<tr>
<td>Negidal</td>
<td>sə̆ːksə</td>
</tr>
<tr>
<td>Solon</td>
<td>sə̆ːktʃə ~ sə̆ːgtʃə</td>
</tr>
<tr>
<td>Oroch</td>
<td>sə̆ːksə</td>
</tr>
<tr>
<td>Udihe</td>
<td>sakeæ (TMS), sakia (Kazama)</td>
</tr>
<tr>
<td>Nanai</td>
<td>sə̆ːksə</td>
</tr>
<tr>
<td>Ulcha</td>
<td>sə̆ːksə</td>
</tr>
<tr>
<td>Orok</td>
<td>sə̆ːksə (Kazama)</td>
</tr>
<tr>
<td>Manchu</td>
<td>səŋgi</td>
</tr>
<tr>
<td>Jurchen</td>
<td>*sə̆ŋgi (四譯館), *ʃəŋgi (會同館)</td>
</tr>
</tbody>
</table>
Some lexical items *might* go back to original doublets:

<table>
<thead>
<tr>
<th>‘fat, thick’</th>
<th>ATR *borgə?</th>
<th>RTR *bərga?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewen</td>
<td>[bərgə] ~ [borgo] ~ [burgə] ~ [běrgǎ]</td>
<td></td>
</tr>
<tr>
<td>Ewenki</td>
<td>[burgu-]</td>
<td></td>
</tr>
<tr>
<td>Negidal</td>
<td>[bəjgə]</td>
<td>[bɕjɡə] ~ [bɕjɡu] ~ [bɕɡː]</td>
</tr>
<tr>
<td>Ewenke</td>
<td>[bogːo]</td>
<td></td>
</tr>
<tr>
<td>Solon</td>
<td>[burgu]</td>
<td></td>
</tr>
<tr>
<td>Oroch</td>
<td>[bɕɡː]</td>
<td></td>
</tr>
<tr>
<td>Udihe</td>
<td>[bɕɡɛ]</td>
<td></td>
</tr>
<tr>
<td>Nanai</td>
<td>[bujɡu]</td>
<td></td>
</tr>
<tr>
<td>Ulcha</td>
<td>[budʒu]</td>
<td>[bɕdʒʊ]</td>
</tr>
<tr>
<td>Orok</td>
<td>[bodo]</td>
<td>[bɕd(ː)ɡ]</td>
</tr>
</tbody>
</table>
And proto-Altaic?

• the same situations might also occur there

• MOREOVER: conservation of harmony class depends on the specific assumptions about vowel correspondences
### Altaic vowel correspondences in KMT languages

*(initial σs, Poppe 1960 and Robbeets 2005)*

<table>
<thead>
<tr>
<th>TR pA</th>
<th>Poppe 1960</th>
<th>Robbeets 2005</th>
<th>Mongolic</th>
<th>Tungusic</th>
<th>Koreanic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poppe (pMo &gt;) WMo</td>
<td>Robbeets pMo</td>
<td>Poppe pTg</td>
</tr>
<tr>
<td>*i</td>
<td>*i</td>
<td>*i</td>
<td>(*i &gt;) *i</td>
<td>*i</td>
<td>*i</td>
</tr>
<tr>
<td>*ə</td>
<td>*e</td>
<td>*e</td>
<td>e</td>
<td>*e</td>
<td>*ä</td>
</tr>
<tr>
<td>*o</td>
<td>*ö</td>
<td>*ə</td>
<td>ö</td>
<td>*ö</td>
<td>*u</td>
</tr>
<tr>
<td>*u</td>
<td>*ü</td>
<td>*u</td>
<td>ü</td>
<td>*ö, *u</td>
<td>*ü</td>
</tr>
<tr>
<td>*I</td>
<td>*i</td>
<td>---</td>
<td>(*i &gt;) *i</td>
<td>[*i]</td>
<td>*i</td>
</tr>
<tr>
<td>*a</td>
<td>*a</td>
<td>*a</td>
<td>a</td>
<td>*a</td>
<td>*a</td>
</tr>
<tr>
<td>*ɔ</td>
<td>*o</td>
<td>*o</td>
<td>o</td>
<td>*ü, *a</td>
<td>*o</td>
</tr>
<tr>
<td>*u</td>
<td>*u</td>
<td>*u</td>
<td>u</td>
<td>*u</td>
<td>*u</td>
</tr>
</tbody>
</table>

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Comparative consequences of the TRH analysis for pTg pMg & pK
Consequences for conservation of harmonic classes:

• The correspondences in both systems predict harmony class mismatches between pA and particular daughters (esp. Korean) under specific conditions.

• Neutralizations such as *i, *ɪ > /i/ give rise to additional complications:
  – Manchu “RTR /i/” ≠ “ATR /i/” versus
  – Modern Korean /i/ → ATR
RTRH as an areal feature
[RTR] harmony as an areal feature

- Janhunen (1981) points out that within Northeast Asia, “apertual harmony” (our RTRH) is an eastern feature, while “palato-velar harmony” (our PH) is a western feature.
- We argue that the domain of RTRH extends to the center of the region, to include Korean, Mongolic, and Tungusic.
“Vowel rotation” hypothesis (Korean, Janhunen 1981)

*ü₁ — *u₂
*ö₃ — *o₄
*ä₅ — *a₆

*ü — *u
*ö — *o
*ä — *a

*ū₃ — *u₁
*ō₅ — *o₂
*a₆ — *ɔ₄
Problems with the vowel rotation hypothesis

• The VRH is based primarily on Ki-Moon Lee’s (1972) hypothesis of a “Korean vowel shift”.

• As we have seen, the evidence for a vowel shift between EMK and LMK is weak.
NE Asian families with RTRH (1): Chukotko-Kamchatkan (Janhunen 1981)

- Proto-Chukotkan Vowel Inventory (Bobaljik 2009)

<table>
<thead>
<tr>
<th></th>
<th>Recessive</th>
<th>Dominant</th>
<th>Transparent</th>
</tr>
</thead>
<tbody>
<tr>
<td>*i</td>
<td>*u</td>
<td>*ε</td>
<td></td>
</tr>
<tr>
<td>*e</td>
<td>*o</td>
<td>*a</td>
<td>*ə</td>
</tr>
</tbody>
</table>

- *ε and *e merged in Chukchi, *ε > *a, *o > *u in Alutor.
NE Asian families with RTRH (2): Nivkh (Janhunen 1981)

• Nivkh prefixes alternate between
  – $i$- before /u, ə/
  – $e$- before /o, a/

• Shiraishi and Botma (2012) show significant stem-internal co-occurrence restrictions:
  – /ə/ never occurs stem-internally with /ə/
  – /a/ never occurs with /u/ and only once with /ə/
NE Asian families with RTRH (3): Yukaghir (Maslova 2003)

• Maslova (2003: 35, fn. 8):
  – present-day Kolyma Yukaghir harmony “might be more appropriately described as (advanced) tongue root (rather than palatal) harmony” (suggestion attributed to Comrie and Lehmann).

• In the Kolyma Yukaghir system,
  – /e/, /ø/ contrast with /a/, /o/
  – The high vowels /i/, /u/ are transparent, but stems with /i/, /u/ normally belong to the same class as /e/, /ø/, with the majority of exceptions involving /i/.
NE Asian families with RTRH (3): Yukaghir

- Proto-Yukaghir vowels (Nikolaeva 2006: 57)
  - Front: *i *e *ö (*ü)
  - Back: *y *a *o *u

- RTRH reinterpretation
  - ATR: *i *e *o *u
  - RTR: *ɪ *a *ɔ *ʊ

- On the RTRH reinterpretation, the TR contrast is lost for high vowels.
[RTR] harmony as an areal feature: summary

• Korean, Mogolian, and Tungusic reside at the center (or western and southern edges) of an RTRH zone.
• Most languages in the zone show some degree of erosion of an earlier RTRH system.
• It is not easy to identify a focal center of the zone.
• This is similar to the situation with tongue root harmony in the Central Sudanic Zone (CSZ) of Africa (Clements & Rialland 2008), where it is unclear what phylum or phyla might be the “source” of TRH.
The NE Asian RTRH zone and the behavior of TRH in contact: commonalities

• The African (CSZ) example shows us that TRH spreads across and within families and phyla.
• In the CSZ case, specialists dispute whether TRH should be reconstructed for proto-families (e.g. Güldemann 2008 for proto-Niger-Congo) or not (Dimmendaal 2001, Hyman 2011).
• In NE Asia, RTRH seems to have to be reconstructed for the various proto-families.
• Given the lack of evidence for relatedness between at least some of the families, RTRH in NEA was almost certainly spread by contact too (Janhunen 1981).
• But as a feature, RTRH in NEA is old.
The NE Asian RTRH zone and the behavior of TRH in contact: differences

• Niger-Congo and Nilo-Saharan TRH includes languages that are ATR-dominant and RTR-dominant (Casali 2003).

• Where we can tell, TRH languages in NE Asia appear to be RTR-dominant.

• CSZ TRH languages typically have contrasting ATR vs. RTR series for mid vowels (72 of 110 languages in Casali’s 2003 sample)

• NEA RTR languages do not. NEA RTR languages typically motivate just a single height contrast.
Reconciling the Korean vowels

• Even prior to EMK, evidence for a PH > RTRH vowel shift is poor.
• Janhunen (1981) compares LMK kǒm :: J kuma ‘bear’. But since proto-Japonic *o underwent raising to central dialect /u/ in non-final position, this example is inconclusive.
• Pre-EMK phonograms such as 毛 (MC maw, OC *C.mʕaw; Baxter-Sagart 2011), 老 (MC lawX, OC *C-rʕu?), 所 (MC srjoX, OC *s-qhra?), 刀 (MC taw, OC *C.tʕaw) all transcribe syllables whose LMK vowel is /o/. If a shift *u > LMK /o/ had occurred, we would expect the antecedents of LMK /o/ to be spelled with phonograms relatable to MC (less likely OC) /u/.
Reconciling the Korean vowels

• As noted by many authors, internal evidence suggests a special status for the LMK non-low central vowels /ɨ/ and /ʌ/.

• These vowels are restricted in their distribution, occurring not at all (in the case of /ʌ/) or only once (in the case of /ɨ/) in absolute onset position.

• They are considered to have been the target of syncope (K-M Lee 1991, Martin 1996)

• They are generally characterized as “weak” vowels.

• We hypothesize that these vowels were delabialized prior to EMK.
Reconciling the Korean vowels

Korean vs. Mongolic/Tungusic
(e.g., MK) vs. (e.g., Khalkha)

Comparative consequences of the TRH analysis for pTg pMg & pK
Reconciling the Korean vowels

- Analysis of pre-EMK vowel inventory prior to weakening (unrounding) of low [labial] vowels

<table>
<thead>
<tr>
<th></th>
<th>*i</th>
<th>*e</th>
<th>*a</th>
<th>*o</th>
<th>*c</th>
<th>*u</th>
<th>*o</th>
</tr>
</thead>
<tbody>
<tr>
<td>[coronal]</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>[labial]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>[low]</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>[RTR]</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>
Reconciling the Korean vowels

- Analysis of LMK vowel inventory in Ko (2012)

<table>
<thead>
<tr>
<th></th>
<th>i</th>
<th>ə</th>
<th>a</th>
<th>ũ</th>
<th>ʌ</th>
<th>u</th>
<th>o</th>
</tr>
</thead>
<tbody>
<tr>
<td>[coronal]</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>[labial]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>[low]</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>[RTR]</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>
Conclusions

• RTRH should be reconstructed for pK, pMo, and pTg.
• The shift RTRH > PH is better motivated than the opposite.
• If pK, pMo, pTg, pTü form a genetic unity, RTRH should be reconstructed for the proto-language.
• KMT reside in a larger zone of RTR-dominant TRH families or phyla.
• In each of these, RTRH appears to be reconstructable to the proto-family level.
References


Ko, Seongyeon. 2011. Vowel contrast and vowel harmony shift in the Mongolic languages. Language Research 47.1


Ladefoged, Peter, and Ian Maddieson. 1996. The sounds of the world’s languages. Wiley-Blackwell.


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