Early Indo-Iranic loans in Uralic: Sounds and strata

Contacts

Archaeology, genetics, languages

Joining forces to shed light on early contacts (4000 BC – 1000 AD) between Indo-European and Uralic speakers

Suomenlinna / Sveaborg 9. 5. 2019
Plan of the talk

1. Introduction
2. Sounds: reconstruction of protolanguage phonology
   1. Indo-Iranic
   2. Uralic
3. Loanwords and sound substitution
   1. Substitution problems
   2. Loanwords
4. Conclusions
Modern distribution of Indo-Iranic and Uralic: no contacts
Introduction

Modern distribution of Indo-Iranic and Uralic: no contacts

Martin Joachim Kümmel, Seminar for Indo-European Studies
Introduction

Scenarios for contact between Indo-Iranic and Uralic

Historical evidence for Iranian on the steppes south of Uralic:
   Scythian/Saka, later Sarmatic-Alanic etc.

Majority view: prehistoric development of Indo-Iranic in western-central steppe, out of PIE (at least) Core IE steppe „homeland“
   Cf. Kuz’mina 2007; Parpola 2012

Southern IIr. homeland (S of Caspian) discussed but minority view

Dating of Proto-Indo-Iranic (PIIr.): no later than 2000 BCE
   Proto-Iranic: rather soon after that
Introduction: Indo-Iranic

First attested in 15th century BCE in the Hurrian state of Mittani and its neighbourhood by divine, throne and personal names as well as hippological terms; linguistically and culturally rather Indo-Aryan than Iranian; slightly more archaic language than Old IA (diphthongs and voiced sibilants preserved); probably relics of earlier traditions, i.e. in fact from older times

Possibly contemporary to the most ancient texts of Indo-Aryan and Iranian tradition, i.e. Old Indo-Aryan (Vedic) and Old Avestan texts, datable only by relative chronology to before 1200-1000 BCE (cf. Hintze 2015); later Vedic and Younger Avestan roughly 1000-500

Old Persian inscriptions since 6th century BCE
Proto-Indo-Iranic sound system

### Consonants

- *p*
- *t*
- *b*
- *d*
- *bʰ*
- *dʰ*
- *s~z*
- *š~ž*
- *w*
- *r*
- *m*
- *n*
- *ć*
- *ḱ*
- *k*
- *j́*
- *ǵ*
- *ɡ*
- *bʱ*
- *dʱ*
- *j́ʰ*
- *ǵʰ*
- *ɡʰ*

### Vowels

- *i*
- *u*
- *i̯*
- *u̯*
- *a*
- *a̯*

### Diphthongs low + high

- *ɪ̯E*
- *u̯E*
- *ə*
- *a̯*

- *ɪ̯*
- *u̯*

- *h*

- *h*

Subphonemic
Proto-Indo-Iranic sound system

Consonants

*p  *t  *tʃ  *c  *k
*b  *d  *dʒ  *j  *g
*bʱ  *dʱ  *dʒʱ  *jʱ  *gʱ
*s~z  *ʃ~ʒ  *χ-h?
*w  *r  *j
*m  *n

Vowels

*i  *u  *iː  *uː
*ə  *e  *aː-ɑː
# Proto-Indo-Aryan sound system

## Consonants

<table>
<thead>
<tr>
<th>*p</th>
<th>*t</th>
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<tbody>
<tr>
<td>*b</td>
<td>*d</td>
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<tr>
<td>*bʰ</td>
<td>*dʰ</td>
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<tr>
<td>*pʰ</td>
<td>*tʰ</td>
</tr>
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</table>
| *s~z| *s~z
| *zʰ| |
| *w  | *r  |
| *m  | *n  |

## Vowels

<table>
<thead>
<tr>
<th>*i</th>
<th>*u</th>
<th>*iː</th>
<th>*uː</th>
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<tbody>
<tr>
<td>*a</td>
<td>*aː</td>
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</tbody>
</table>

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Old Indo-Aryan (Sanskrit) sound system

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Vowels</th>
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</thead>
<tbody>
<tr>
<td>p</td>
<td>i</td>
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<td>t</td>
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<td>c</td>
<td>ī</td>
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<td>k</td>
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<td>b</td>
<td>a</td>
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<td>ā</td>
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<td>ḍ</td>
<td>ai</td>
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<td>j</td>
<td>au</td>
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<td>g</td>
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<tr>
<td>bh</td>
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<tr>
<td>dh</td>
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<tr>
<td>ḍh</td>
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<tr>
<td>gh</td>
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<tr>
<td>ph</td>
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<td>th</td>
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<td>ṭʰ</td>
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<td>ch</td>
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<td>kh</td>
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<td>s</td>
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<td>ṕ</td>
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<td>ś</td>
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<td>ṟ</td>
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<td>w</td>
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<td>l</td>
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<td>y</td>
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<td>m</td>
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</tr>
<tr>
<td>n</td>
<td></td>
</tr>
<tr>
<td>ṇ</td>
<td></td>
</tr>
</tbody>
</table>

Consonants: p, t, ṭ, c, k, b, d, ḍ, j, g, bh, dh, ḍh, gh, ph, th, ṭʰ, ch, kh, s, ṕ, ś, ṟ, w, l, r, y, m, n, ṇ.

Vowels: i, u, ū, a, ā, ai, au.
Old Indo-Aryan (Sanskrit) sound system

Consonants

| p | t | ṭ | tɕ | k |
| b | d | ḍ | dz | g |
| bʱ | ḍʱ | ḍʱ | gʱ |
| pʰ | tʰ | ṭʰ | tɕʰ | kʰ |
| s | ṣ | ɕ |

Vowels

| i | u | iː | uː |
| aɛ-a ʰ | aː-ɑː |
| ai | au |

Other phonemes:

w | l | r | j |
| m | n | ń |
Proto-Iranic sound system

Consonants

*p~f  *t~θ  *c  *č  *ć  *k~x
*ð  *d  *j  *ǰ  *j  *g
*s~z  *š~ž
*w
*r  *j
*m  *n

Vowels

*i  *u  *ī  *ū
*ə?
*a  *ā

? probably still allophonic /C_rC
Proto-Iranic sound system

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>*p<del>f *t</del>θ *ts</td>
<td>*i *u *i: *u:</td>
</tr>
<tr>
<td>*tʃ *c *k~x</td>
<td></td>
</tr>
<tr>
<td>*b *d *dz *dʒ</td>
<td>*ə?</td>
</tr>
<tr>
<td>*g *s<del>z *ʃ</del>ʒ</td>
<td>*a *a:</td>
</tr>
<tr>
<td>*r *j</td>
<td>? probably still allophonic /C_rC</td>
</tr>
</tbody>
</table>

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### Common (Old) Iranic sound system

#### Consonants

<table>
<thead>
<tr>
<th>Consonants</th>
<th><em>Common (Old) Iranic sound system</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>t</td>
</tr>
<tr>
<td>t</td>
<td>c/č</td>
</tr>
<tr>
<td>c</td>
<td>k</td>
</tr>
<tr>
<td>b~β</td>
<td>d~ň</td>
</tr>
<tr>
<td>j/ỹ</td>
<td>g~ỳ</td>
</tr>
<tr>
<td>f</td>
<td>θ</td>
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<tr>
<td>s</td>
<td>š</td>
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<tr>
<td>Š</td>
<td>(ʃ)</td>
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<tr>
<td>x</td>
<td>h</td>
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<tr>
<td>z</td>
<td>ż</td>
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<tr>
<td>Ž</td>
<td>(ʒ)</td>
</tr>
<tr>
<td>w</td>
<td>r</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
</tr>
</tbody>
</table>

#### Vowels

<table>
<thead>
<tr>
<th>Vowels</th>
<th><em>Common (Old) Iranic sound system</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td>ũ</td>
<td>ũ</td>
</tr>
<tr>
<td>*ə?</td>
<td>(ē)</td>
</tr>
<tr>
<td>(ō)</td>
<td>a</td>
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</tbody>
</table>

([]) = only later/dialectal
# Common (Old) Iranian sound system

## Consonants

<table>
<thead>
<tr>
<th>p</th>
<th>t</th>
<th>tɕ</th>
<th>k</th>
<th>b~β</th>
<th>d~ð</th>
<th>dz</th>
<th>g~ɣ</th>
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<tbody>
<tr>
<td>f</td>
<td>θ</td>
<td>s</td>
<td>(ɕ)</td>
<td>x</td>
<td>h</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>z</td>
<td>ʒ</td>
<td>(z)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>w</td>
<td>r</td>
<td>j</td>
<td></td>
<td></td>
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<td>m</td>
<td>n</td>
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## Vowels

<table>
<thead>
<tr>
<th>i</th>
<th>u</th>
<th>iː</th>
<th>uː</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*ə?</td>
<td>(eː)</td>
<td>(oː)</td>
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</table>

() = only later/dialectal
## Iranian: Internal classification

### Old Iranian varieties: Phonological features

<table>
<thead>
<tr>
<th>Language</th>
<th>ſ</th>
<th>j/h</th>
<th>ſv</th>
<th>jv/hv</th>
<th>tw</th>
<th>tr</th>
<th>ſr</th>
<th>sr</th>
<th>s</th>
<th>cy</th>
<th>p</th>
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<tr>
<td>Sanskrit</td>
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<tr>
<td>*PIIr.</td>
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<tr>
<td>*PIr.</td>
<td>ts</td>
<td>dz</td>
<td>tsw</td>
<td>dzw</td>
<td>ōw</td>
<td>ōr</td>
<td>tsr</td>
<td>sr</td>
<td>s</td>
<td>ĺj</td>
<td>p</td>
</tr>
<tr>
<td>EN (Saka)</td>
<td>s</td>
<td>z</td>
<td>ſ</td>
<td>ź</td>
<td>ōw</td>
<td>ōr</td>
<td>sr</td>
<td>hr</td>
<td>h</td>
<td>čy</td>
<td>p</td>
</tr>
<tr>
<td>WN (Scythian)</td>
<td>s</td>
<td>z</td>
<td>sp</td>
<td>zb</td>
<td>ŧβ</td>
<td>ŧr</td>
<td>sr</td>
<td>hr</td>
<td>h</td>
<td>čy</td>
<td>f</td>
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<td>Avestan</td>
<td>s</td>
<td>z</td>
<td>sp</td>
<td>zb</td>
<td>ŧβ</td>
<td>ŧr</td>
<td>sr</td>
<td>ŧr/hr</td>
<td>h</td>
<td>šy</td>
<td>p</td>
</tr>
<tr>
<td>Central (W/E)</td>
<td>s</td>
<td>z</td>
<td>sp</td>
<td>zb</td>
<td>ŧβ</td>
<td>ŧr</td>
<td>sr</td>
<td>hr</td>
<td>h</td>
<td>šy</td>
<td>p</td>
</tr>
<tr>
<td>SW (Persian)</td>
<td>ŧ</td>
<td>d/ď</td>
<td>s</td>
<td>ź</td>
<td>ŧw</td>
<td>ts?</td>
<td>ts?</td>
<td>hr</td>
<td>h</td>
<td>šy</td>
<td>p</td>
</tr>
</tbody>
</table>
### Sound changes in Old Iranian: *ts, *tsw > θ, s / *tsw > š

<table>
<thead>
<tr>
<th>Alanic - Ossetic</th>
<th>(Scythian)</th>
<th>Sogdian</th>
<th>Yaynobi</th>
<th>Yazgulami</th>
<th>Tocharian</th>
<th>Tumšuq</th>
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<tbody>
<tr>
<td>Caspian</td>
<td>Xwarezmian</td>
<td>Avestan</td>
<td>Tajiki</td>
<td>Šuyni</td>
<td>Sariqoli</td>
<td>Khotan</td>
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<tr>
<td>Zazaki</td>
<td>Parthian</td>
<td>Bactrian</td>
<td>Dari</td>
<td>Iškašimi</td>
<td>Waxi</td>
<td>Burušaski</td>
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<td>Kurdish</td>
<td>Central</td>
<td>Pashto</td>
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<td>Munji</td>
<td>Yidya</td>
<td>Nuristani</td>
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<td>Tat</td>
<td>Persian</td>
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<td>Wanetsi</td>
<td>Ormuri</td>
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<td>S-Baškardi</td>
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</tbody>
</table>
Indo-Iranic consonants

Arguments for PIIR. *ć [tɕ/tʃ] instead of *ś

- Nuristani ts = IA ś (vs. s = s)
  affricate + palatal = *ć

+ Arguments for Proto-Iranic affricates *ts, dz

- Optimal source of s, z = Persian θ, d/ð

- Post-PIr. dissimilation in Av. zasta- = dasta- ‘hand’ elsewhere < *dzasta-

- Tocharian loanwords with ts = Common Iranian s/z < PIIR. *ć
tsain(wa) ‘arrow’ ← *dzainu-, Av. zaēnu-, zaēna- ‘weapon’
etse- ‘mule’ ← *atswa-, Av. aspa- ‘horse’ (Peyrot 201)
Indo-Iranic consonants

Proto-Iranic *ts or even still *ć?

Tumshuqese ś, Khotanese śś, Wakhi ś < *ćw vs. s < *ć

Persian s vs. θ, elsewhere s vs. sp

Eastern Saka *ś : *s < *św : *ś (or *ć : *ts) < *ćw : *ć?

Not necessarily: secondary development of *sw possible

Cf. Armenian ś < *ćw vs. s < *ć

Cornish dzw > dʒ

Parallel (but fronted) Albanian = Persian s < *tsw < *ćw vs. θ < *ts < *ć

Rounding + retraction > postalveolar

> palatoalveolar by contrast to old *ś > retroflex ś
Indo-Iranic consonants

Secondary palatals *ḱ, *ǵ, *ǵʱ in alternation with *k, *g, *gʱ
Generally [tɕ~tʆ] etc. (later > [tʃ, ts] etc.), still clearly palatal(ized)
But: less advanced than primary, so probably still real palatals *ḱ, *ǵ, *ǵʱ [c, ɟ, ɟʱ]
Still in Old Persian (Lipp 2009)?

Sibilants: *s + *š (partly alternating) with voiced allophones
*š/ž already depalatalizing:
• “Retroflex” (non-palatalized) in all of IA and most of Eastern Iranian
• Avestan š less palatal than c, j, y, ʃ (< *ḱ, *ǵ, *y, ǵy); already near to OIA š
• less palatal “middle” quality in Western Iranian and probably Sogdian and Alanic (merger with *sr > *š and *š < *cy)
**Indo-Iranic consonants**

“Laryngeals”

(P)IE consonants mostly lost in attested languages, normally also in Indo-Iranic

Partly preserved in Anatolian: Hittite, Luwian ḫ [χ], Lycian χ [k], Carian k [k] But traces of preserved lost consonant *h even in Iranian (Kümmel 2016; 2018)

1. Devoicing in Iranian (vs. aspiration in Indic)

YAv. *mas-* < *mac-* < *maj-h- vs. *mazā-* < *maj-ah-* ‘big’, Skt. *mah(ā)-, Greek méga
daθ- < *dath- < *dad-h- vs. daδā- = /dadā-/ < *dad-ah-* ‘to put, give, create’
nāf-* < *nāph-* < *nāb-h- vs. nabā-* < *nab-ah-* ‘navel’
isu-* ‘cold’ < *icu-* < *ij-h-u- vs. *yajā-* ‘glacier’ in Wahi yaz
*θaiwar-* ‘husband’s brother’ < *thaiwar-* < *dhaiwar-* < *dahiwar-; Skt. devār-
*θau-/θū- ‘to burn’ < *thau-* < *dhau-* < *dahu-; Skt. dū-
Indo-Iranic consonants

“Laryngeals”

2. Sporadic preservation in peripheral SW Iranian (Persian dialects)

M/NPersian xāyag xirs xišt xišt xēšm xīr xāk h/xēš hanzūg hēsm
OPersian āršti- ištī-
Parthian hištīg ēšmag ēm anjūg ēzm
Avestan aēm arša- aršti- ištīia- aēšma- aēa- qzah- aēsma-
Skt. ūkṣa- rṣti- īṣṭakā- āsa- īṣā- āmhu- ēdhas-
*PIIr. hāwya- hṛtša- hrṣti- hištī- hayš- hrya- hása- hayš- hanjʰu- haydzʰ-
*PIE Ḫōwjo- Ḫrōko- Ḫrsti- ṭ? hajşx- Ḫrjo- Ḫahs- Ḫajs- Ḫamǵʰ- Ḫajdʰ-

⇒ Proto-Iranic and Proto-Indo-Iranic still had some kind of *h/x potential substitution by Uralic *x/k/š
Indo-Iranic consonants: changes from IE

Important changes: “L-rhotacism”, RUKI, satemization
1) L-rhotacism: PIE *l = *r > PIIR. *r (at least in most dialects)
   only IIr., precedes:
2) RUKI: Phonologized allophony s ~ š
   s > š after non-anterior segments (r, ū, w, k, g, ī̆, j)
   also Balto-Slavic, partly Armenian (similar process in Luwian)
3) Satemization: fronting and assibilation of PIE “palatals”,
   delabialization of “labiovelars”
   *k̆, *ğ > PIIR. *ć, *j̆ etc. vs. *kʷ, gʷ > PIIR. *k, *g
   (followed by *ć > *š ⇒ phonologization of RUKI-allophony)
   also Balto-Slavic, Armenian, Albanian (similar processes in Luwic Anatolian)
Indo-Iranic vowels: changes from IE

Brugmann’s Law \( *o > *\ddot{o} (> *\ddot{a}) \) in open internal syllables (similar in Anatolian)

Low realisation of PIE \( *e \ [\varepsilon], \ a, \ o \ [\varnothing] \) > pPIIr. \( *\varepsilon, \ a, \ a/\varnothing \)

Law of palatalization:
\[
*k, g, g^h > [c, \dot{t}, \dot{j}] / _V[+\text{front}] = \text{pPIIr.} \ *\varepsilon, \ \ddot{\varepsilon}, \ i, \ i, \ y
\]

Followed by merger of low vowels
- Front \( *\ddot{\varepsilon} = \text{back} *\ddot{a} \ [a/\varnothing] > \text{central} *\ddot{a} \ [a-\alpha] \)
- \( \Rightarrow \) phonologization of „secondary palatals“ \( *\dot{k}, *\dot{g}, *\dot{g}^h \)

pPIIr. vowel contrast still reflected by early borrowings?

Syllabic nasals > \( *\ddot{\alpha} (N) > a(N) \), loss of \( N \) before obstruents (not \( *h \))
# Pre-Proto-Indo-Iranic sound system

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>*p</td>
<td>*i</td>
</tr>
<tr>
<td>*t</td>
<td>*ʊ?</td>
</tr>
<tr>
<td>*b</td>
<td>*a</td>
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<td>*k [c~k]</td>
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<td>*y?</td>
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Indo-Iranic: relative chronology

L-rhotacism: *l > *r
RUKI+Satem: *s > š after non-anterior; *k etc. > *č; *kw etc. > *k
Lowering of mid vowels *e [ɛ] > *æ, *o [ɔ?] > *ɒ
Brugmann’s Law *ɒ > ə (open syllables)
Palatalization: *k etc. > *k̂ / _ě, ţ, j
Secondary *ə, *ã and possibly *i
Merger of lower vowels: *æ + *a + *ɒ > *a; *ã > a
Loss of (some) laryngeals
### Proto-Uralic sound system (Sammallahti 1988)

<table>
<thead>
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# Proto-Finno-Ugric sound system (Sammallahti 1988)

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Proto-Finno-Ugric sound system (Sammallahti 1988)

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Proto-Uralic sound system (cf. Zhivlov 2014, modified)

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</table>
Proto-Uralic consonants

Arguments for affricate $^*tɕ = ^*ć$ instead of $^*ś$

- Saamic $^*ć$ (*č) and also geminate $^*ćć$ in Fennic retention instead of improbable change
- Affricate in Permian and Ugric $^*ńć$ (less compelling)
- Relics of $^*ć$ in Permian and Ugric
- $^*ć > ^*ś > ^*s$ (and $^*s > ^*θ$) in Common rather than Proto-Ugric
  - Mansi split into š and s; Hungarian (very) sporadic š
    - (cf. borrowing of $^*säptä$ ‘7’ before or after this chain shift)
- Proto-Samoyed $^*ć$ (Zhivlov 2018b) with later parallel changes to $^*ś, ^*s$
Proto-Uralic consonants

cf. palatal and/or occlusive reflexes of PSm “*s”:

Nganasan weak grade j~d’, nd’ < *s, *ns
  \textit{basa} \sim \textit{bad’a} ‘iron’ < *\textit{wäsä}; \textit{bansə} \sim \textit{bände}?‘all’

Nganasan *ē > *e > old e, modern i /ń,s_
  nńir, nńirku < *ńer, *ńerkå
  \textit{modern sır, sır, sıru}; old \textit{ser}; \texttt{--}; \textit{sęru} < *sę́r, *sę́r, *sę́rå
  sįədə < *sejə

Tundra Enets d’ = Forest s < *ns, *ms: *męnsə-, *ńęnsəjr-, *sünıę, *ęmså
  uńda = osa < *ęmså (cf. d’ = s < *rć < *rkʲ in \textit{meänder} = mese < *märkå)

Affricate in Nenets pc, nc (inconclusive)
Proto-Uralic consonants

Selkup *ś > N/M š, ž; S ss, s < *ns; *kūšə, *qaśə- < *kunsə, *kənsə-
  *ć > ś, feeding *ś > s, earlier than *ńć > ńś > ś
Mator nź <ндž,нш,nsch> < *ns: кунджимъ; künschum
Mat. ś/sʲ/ž/zʲ <ш,съ,эъ,sj,sch> often even in back vowel words = still palatal
Mat. /k/ [kʲ] <къ,гъ,k,g> before old front vowels:
  keje, kejbe, ki, kūŋžü < *sājə, *sājtwə, *sijə, *sünsə
  *ć > kʲ /k/
  cf. Selk. (*j/k >) *ć > k /_V[+front]: kū, kindi, kintə
⇒ PSm. still *ć (with *ś allophones?) ⇒ PU *ć
Proto-Uralic vowels

“Laryngeal” sequences *äx, *ax, *ix; *ix, *ux (Janhunen 1981)
   > FU long vowels *ee, *ii, *oo, *ii, *uu

Secondary, mainly due to pre-resonant lengthening in Finnic (Aikio 2012)
   = simple *i, j, u; ä, å

Unaccented *i~j rather = *ə (Kallio 2012)?

Arguments for third unaccented vowel *a₂/o (Zhivlov 2014)
   Distinction of H á = X ā ~ Sm -å, Ma -ə as in *kala₁ ‘to fish’
      vs. H a = X ū/ī ~ Sm -ə, Ma -Ø as in *kala₂ ‘fish’

Different similar proposal for unaccented *o by Aikio 2015
   Not yet supported by front vowel parallels, still somewhat unclear
Proto-Uralic vowels

Other problems with traditional reconstruction
Change $a...ə > o...a$ (Aikio 2015) in Saamic and Mordvin unmotivated
Change $ä...ä > a...ə$ (Kallio 2012; Aikio 2015) in Finnic unmotivated
Saamic $*o > *ɔ > *oa vs. *a > *å > *ō > *uo$ difficult to model
Hungarian quantity remains largely unclear
Non-parallel development of $*i, *ü, *u / *e, *ɛ, *o / *ä, a$
  E.g. lowering of $*i$, $*u$ but not $*ü$ in Ug
  raising of $*e$ but not of $*o$ in Sa, Mo, Ma, Ms, X, Sm
  lowering of $*o$ but not of $*e$ in Ma, P, Ug, Sm
  lowering of $*i$ but not of $*e/o$ in Sa, F, Mo ...
Proto-Uralic vowels

Arguments for non-high *ɛ [ɛ/ɜ] vs. high *ɨ [ɨ/ɯ] (cf. Pystynen 2017)

• merger with *a in West Uralic and partially elsewhere
• Proto-Mansi *ɛ > ė/ā rather than *ɨ
  (also *e > ī/ē; *ō > ō/ū rather than *i, *û)
• higher reflexes in H, X, Sm in (potential) raising environments

Arguments for back rounded *å [ɔ] vs. *a (cf. Pystynen 2017)

• rounded reflexes in Sa, Ma, P, Ms, Sm; partially in F, H
• unrounded reflexes by conditioned changes (often in palatal environments)
• Sa/Mo change *å > *o easier to understand (but why *-ə > *-a?)
Proto-Uralic vowels

Arguments for shifted round/back vowels ü, u, o < *u, o, ɔ/a
(Pystynen 2017)

• isolated /y/ most often from */u/ cross-linguistically, often with chain
  shift o, u > u, y (and possibly also a > o)
• Lower reflexes of PU *o than of allegedly parallel *e
  However:
• *ü clearly a front vowel in all branches; *u normally as high as *i
  ⇒ PU already *ü, *u but still *ɔ
  maybe additional *o > Sm *o = F *o?
• *ɔ would not leave much room for rounded back *å
  ⇒ older *a : *å/ɔ > *a : *o only in more Western branches?
Proto-Uralic vowels

Arguments for additional centralized vowels (Häkkinen 2009)
split correspondence of F *e in Sa *ə / *ē and Mo *e / *i
split correspondence of F *o in Sa *o / *ō and Mo *o / *u
Cases of F i/ü vs. back/rounded vowels elsewhere

Quantitative “two layers” reinterpretation by Tálos 1987
• *e, o before *ä/a < *ã, ā
• *ī/i, ū/i before *ə < *ē, *ō by metaphony < *ã, ā
• *i, ü, u < *ī, ū, ū
• *e, o before *ə < *i, u
• *ä, a < *ã, a
Proto-Uralic vowel systems: alternatives

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<th>Häkkinen 2009</th>
<th>Tálos 2015</th>
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Martin Joachim Kümmel, Seminar for Indo-European Studies
Proto-Uralic vowels

Arguments for quantitative reinterpretation (Tálos 1987; 2015)

- More natural vowel changes: “vowel rotation”
  = high > short, short > low, low > long, long > high
- Preservation of length in H á, é < *o=*ā, *e=*ā
- Preservation of low *ā in eastern low reflexes of “*o”
  a...ə > Sa-Mo *ā...ə > *ā...a > *o...a
- ä...ā > F *ǟ...ə > *ā-ə > a...ə/ō...ə
- Easy explanation of U *o for PIIr. *ā and maybe also *á

Difficulties

- Frequent Sa *ə = F e instead of expected *ā > *ī > S *i = F *ī
- Non-parallel behaviour of *ī (= *ɛ) vs. *ī, *ū, *ū
## Proto-Uralic sound system, modified 1

### Consonants

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### Vowels

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## Proto-Uralic sound system, modified 2

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Substitutions in borrowing: consonants

PIIr. = pPIIr. *ć, ǯ, ǯʰ \rightarrow \text{PU} *ć
    not IA *ś \rightarrow \text{PU} *ś (but maybe *ć \rightarrow *ś in later borrowings)
PIr. *c [ts], ǯ [dz] \rightarrow \text{U} \text{ non-palatal} *č or *ks (?) or (later?) *s
CIr. *s, z \rightarrow \text{U} *s, later \rightarrow \text{Ug} *s (= \text{PU} *ć)
  Very late CIr. z \rightarrow \text{P, H} z
PIIr. *š, ǯ \rightarrow \text{U} \text{ (retroflex)} *š, never \rightarrow *ć (*ś)
PIIr. *h [x-h] \rightarrow \text{U} *k, rarely *s?
  later PIIr., PIr. *h [h] \rightarrow \text{U} Ø
PIIr. *ḱ normally \rightarrow \text{U} *k, only late \rightarrow *ć
Substitutions in borrowing: vocalism

Vowel (mis)matches

1) IIr. low central *a, *ā vs. Uralic front *ä / back *å
   > either substitution possible

2) IIr. only one (rare) mid central vowel *ə
   *ə → U *ɛ but not → U *e/o

But if U *o = lower [ɔ-ɒ]: allophone of PIIR. *a [æ-æ-ɔ]?
   Would explain *a/ā → *o
   [No good arguments for non-low/rounded PIIR. *ā]
Substitutions in borrowing: vocalism

Vowel (mis)matches

U *ä ↔ PIIR. *a < pPIIR. *æ does not imply pre-PIIR. borrowing
  possibly ↔ pPIIR. *a < PIE *o

U *o [ɔ-ɒ] maybe also ↔ PIIR. *a < pPIIR. *æ/a
  not necessarily ↔ pPIIR. *å/lPIE *o

U *e ↔ PIIR. *a more problematic
  if PU *ā, then ↔ pPIIR. *a < PIE *o,
  otherwise potential evidence for pPIIR. *e [ɛ]
Substitutions in borrowing: vocalism

Vowel mismatches?

Pre-PIIr. vowel not always clear

*ḿárta- ‘mortal, (hu)man’ < *ḿérto- ← *ḿṛtó- ‘dead, mortal’;
  type *ǵénhto- ‘child’ ~ *ǵṅhtó- ‘born’
  but no evidence for *ḿéro- elsewhere

Or rather < *ḿórtó- ← *mertó- ← *mer- ‘death’; cf. Greek mórtos
  (vs. brotós), cf. Beekes 2010: 969
  type *ǵʰóstó- ‘arm, hand’ ← *ǵʰestó- ← *ǵʰes- (cf. Neri ??: 197f.)

Unknown vowels in *makš-, *warājʰá-, *árdʰa-/ardʰá- and more
Loanwords: PIIr. and Pre-PIIr.

Indications of IIr. origin:

- *L*-rhotacism
- RUKI and satem (but also Balto-Slavic) = U *š, *ć
- Low vowels *ä/a for IE *e/o (but latter also BS)
- Front vowel for IE back vowel and vice versa
- Simple (non-high) vowel for IE syllabic *N
- Not found in other branches of IE
Loanwords: earlier than IIr.

Similarities in basic vocabulary, no indication of IIr. loans

PU *wetə ‘water’  PIE *wód-/wed-/ud-, IIr. *ud-
P(F)U *jäŋə ‘ice’  PIE *jeǵ-i/o-, IIr. *yaja-
P(F)U *kätə ‘hand’  PIE *ǵʰes-, IIr. *ʃʰásta-
PU *nimə ‘name’  PIE *h₁n(ā)h₃mn-, IIr. *náman-
P(F)U *näkə- ‘see’  PIE *deḱ- ‘perceive’, IIr. *dăč-
PU *kV-/mV- ‘who,what’  PIE *kʷV-/mV-, IIr. *ká-/kí-
PU *kaw- ‘ear’  PIE *χáw-s-
PU *kaja- ‘sun, appear’  PIE *χáj-r- ‘morning, day’

(Pre-)PIE loans? Chance resemblance? Cognates from Proto-Indo-Uralic?
Loanwords from Uralic?

Unclear direction, IIr. borrowings from U? Underresearched!

PU *weŋćə ‘knife’
PIIr. *wāći- ‘axe’

PU *peŋka ‘mushroom’
PIIr. *bʱangá- ‘narcotic’

P(F)U *kota ‘hut’
PIr. *kata- ‘house’

PU *käďwä ‘female animal’
PIr. *gadwā- ‘bitch’
PIr. *kaθwā- ‘female donkey’

PFU *katV- ‘steal, thief’
PIr. *gada- ‘robber, thief’

PU *kala ‘fish’
PIr. *kara- ‘big fish’

Maybe more in extinct Northern Iranian
Loanwords

Uralic vs. Finno-Ugric: Few loanwords include Samoyedic

Research history: Sm less well investigated

LWs with PU distribution:
*\(kaja\)- ‘sun, light, appear’ ← (p)PIIr. *\(xayar\) ‘day’
*\(kajšV\)- ‘sickness’ ← (p)PIIr. *\(xajšá\) ‘seeking’
*\(kād\'wā\) ‘female’ → PIr. *\(gadwā\) / *\(kaθwā\) ‘female dog/donkey’

Only Sm: *\(wərkə\) ‘bear’ ← P(I)Ir. *\(wŕka\) ‘wolf’ (?)
*\(tajkā\) ‘edge, knife, sword’ < *\(ta/ojka\) ← P(I)Ir. *\(tayga\)-
*\(je̮ə/joə\) ← P(I)Ir. *\(yáwa\) ‘barley’ (Janhunen 1983)
*\(wātə-/wåtå\) ‘(let) grow’ < *\(wa/okša\) ← PIIr. *\(wakš\) (Aikio 2002)
*\(ćoja\) ‘be born’ <? *\(ća/oja\) ← PIIr. *\(j́aya\)-
Loanwords from Indo-Aryan branch?

Parpola 2012

\[*\text{mētə-śištā} ‘wax’ in Komi P ma-siś ‘(wax) candle’ \leftrightarrow *mædʰu-śištə-

= Skt. \text{madhu-śiṣṭa-} ‘wax’ (not Vedic, unusual)

compound of \text{madhu-} ‘honey’

and \text{śiṣṭa-} ‘left (over), rest’ from \text{śiṣ-} ‘to leave over’

Inner-Komi compound of \*\text{mētə} ‘honey’ > K \text{ma}

and \*\text{ćiśtā/ćištā} ‘wax’ > K \text{śiş(t/k-)}, cf. Mo \text{štā}, Ma \*\text{šište}, Ud \text{suś(t-)}

< PIIr. \*\text{ćištə-} ‘left over’, not necessarily IA

root \*\text{ćiš-} not preserved in Iranian, but probably PIIr.
Loanwords from Indo-Aryan branch?

Parpola 2017

*watsá- ‘calf’ ⇔ *waćća > F vatsa ‘stomach’ (?)

Semantics – problematic (at least not compelling)

Sound substitution *ts ⇔ *ć(ć) unsupported (but conceivable)

Presupposition: *ts cannot be Iranian, thus IA

But PIE still had *ts, so Iranian source remains possible
Loanwords: Problematic cases

Ug *mańćV ‘(hu)man’ > H magy-ar, Ms *māńć(ē), X *māńć
↔ *mānuš-, Skt. mānuṣ-
IIr. *ś never → U palatal

F synty- ‘be born’ < *sen-tū- < *senV-
↔ (pre-P)Ir. *dzen- < *jāen- = IIr. *jān- < PIE *ǵēnh-
F vowel irregulär; no *e from Iranic

F herā- ‘awake’ < *čerā-/šerā-
↔ (pre-P)Ir. *ǰer- < *ǵār- = IIr. *ģar- < PIE *hger-
secondary palatals never → U retroflex, no *e from Iranic
Loanwords: PIIr. and Pre-PIIIr.

*x/h > *k
pPIIr. *xŕtá- (PIIr. *hŕtša-) ‘bear’ → *kerša-w > F
pPIIr. *xawšās > PIIr. *hawšās (?) ‘dawn’ → *kawša- (or < pre-Baltic?) > Sa
?pPIIr. *xayšá- > PIIr. *hayšá- ‘seeking’ → PU *kajša- ‘sickness; longing?’

*x/h > *š
pPIIr. *puxtá- (ved. pūtá-) → *puṣta- > F puḥdas ‘pure’
pPIIr. *pun(á)x- → FP punaṣ-/punṣa- ‘to clean’ > Mo ponža-, F poh-ta- ‘to winnow’

*h > zero
pPIIr. *hánća → FU *ońća ‘share’
pPIIr. *hája- → FU *aja- ‘to drive’
Loanwords: Vowel correlations

Front → mid front
pPIIr. *këkľá- (⟩ PIIr. *kakrá-) → *keklā (*kāklā) ‘curve’ > Sa
pPIIr. *mädʰu (⟩ PIIr. *mädʰu) → FU *metə (*māta?) ‘honey’
pPIIr. *mërta- (?) > PIIr. márta- → FP *mërta (*mārtā) ‘(hu)man’
pPIIr. *yëwa- → U *jewā (*jāwā) ‘barley’ > FP
pPIIr. *këkrä- → PIIr. *kkrä (⟩ *kǟkrä) > Sa ‘round’
pPIIr. *këtstra- → PIIr. *kstrā (⟩ *kǟstrā?) ‘spindle’

Front → low front
pPIIr. *pæćû/áw- → Plr. *pacû/aw- → *päčä- > Ug ‘reindeer calf’
Loanwords: vowel correlations

Front → low front
pPIIr. *sæptą > PIIr. = (p)PIr. *saptá → (p)Ug *säptä ‘7’
pPIIr. *ćærdʰa- > PIIr. *ćárdʰa- → *ćärtä/ćertä >? Sa *ćeartə ‘tribe’

Back/central → mid back
(p)PIIr. *(H)ánća- ‘share’ → FU *ońća (*āńća)
pPIIr. *párća- (or Baltic?) ‘pig’ → WU *porczęs (*pārčas)
pPIIr. *jōHyja- > PIIr. *jāya- ‘be born’ → *ćoja- (*ćāja-?) > Sm *ćojå-
(why not *ćåjå-? other examples of PU *oja in Sm?)
P(I)Ir. *tayga- → *tajka/*tojka > Sm *tajkå ‘point’
Loanwords: vowel correlations

Back/central → low back
PIIr. PIr. *wáHata- > Clr. *wāta- → Ms, X *wāt ‘wind’
   High → high
PIIr. *ćišta- ‘left over’ → FP *ćištä ‘wax’
PIIr. *wišá- ‘poison’ → FP *wiša ‘poison’
?PIIr. *ćuktá- > PIr. *tsuxta- ‘burnt’ → F, Mo *šukta
   Mid (> low) → high
pPIIr. *ǭbʰrá- ‘rain’ (> PIIr. *abʰrā-) → WU *iprā > Sa
PIIr. *wŕka- > PIr. *wërka- ‘wolf’ → *wirkäs (?) > Mo
   → U *wurka (?) > Sm *wërka ‘bear’
Loanwords: vowel correlations

Mid (> low) → mid/high

pPIIr. *ćōtā- (> PIIr. *ćatā-) ‘100’ → FU *ćęta

pPIIr. *yāmā- (> PIIr. *yamā-) ‘twin’ → WU *je/ama > Sa *juomē-

pPIIr. = PIIr. *trna- (> Plr. *tərna-) ‘grass’ → FP *tərna

pPIIr. = PIIr. *mrtā- (> Plr. *mərtə-) ‘dead’ → FP *mərtə-
PIIr. *wršā > Plr. *wəršā → *wersə > F(⇒)Sa *warsa ‘foal’

(with Alanic š > s, but that was late and only Yassic-Ossetic)

pPIIr. *xītča- (> PIIr. *hītša-) ‘bear’ → F *kəršə-w?

Loanwords: vowel correlations

Front $\rightarrow$ mid back
(IE $^*$ēlā- $\rightarrow)$ pPIIr. $^*$ěrā- $\rightarrow$ PIIr. $^*$árā- ‘awl’ $\rightarrow$ FU $^*$ora ($^*$āra)
pPIIr. $^*$pæć(á)w- $\rightarrow$ Plr. $^*$pacāw- ($^*$pácaw-?) ‘animal’ $\rightarrow$ FP $^*$počaw ($^*$pāčaw)
pPIIr. $^*$sæna- $\rightarrow$ PIIr. $^*$sana-ká- $\rightarrow$ FU $^*$soŋka ‘old’
pPIIr. $^*$yæwa- $\rightarrow$ PIIr. $^*$yáwa- ‘barley’ $\rightarrow$ $^*$je̮wə (?) $\rightarrow$ Sm $^*$je̮ə/joə
pPIIr. $^*$wætsá- $\rightarrow$ P(I)Ir. $^*$watsá- $\rightarrow$ Clr. $^*$wasa- ‘calf’ $\rightarrow$ Ug $^*$wəsakV
pPIIr. $^*$pæra- $\rightarrow$ PIIr. $^*$pára- ‘far; former, ancient’ $\rightarrow$ Sa $^*$pora/parə ‘old’
pPIIr. $^*$wæjHna- $\rightarrow$ PIIr. $^*$wáyna- ‘look, see’ $\rightarrow$ Sa $^*$wojna-/wajnə- ‘see’

Front $\rightarrow$ low back
pPIIr. $^*$jʰěsra- $\rightarrow$ PIIr. $^*$jʰásra- $\rightarrow$ FU $^*$časra ‘1000’
Loanwords: vowel correlations

Front → low back
pPIIr. *hwækš- > PIIr. *(h)wakš- → *wakšV- (*wokšV-) > Sm *wâtə-/wâtå- ‘grow’
pPIIr. *pǽra- > PIIr. *pára- → FP *para ‘good’
pPIIr. *sǽras- > PIIr. Plr. *sáras- → Ug *sara ‘flood’
?qPIIr. *mánjʰa- > Plr. *mandza- → F, Mo *ma/e̮ksa- ‘pay’

Back/central → mid front
IE *wólko- > (p)PIIr. *wárca- → FU *werćV ‘shoot; hair’ → F, X
IE *mórto- > pPIIr. *márta- (?) → FP *mertä (*mǟrtä) ‘(hu)man’
IE *pónt-eh- > (p)PIIr. *pánta- → P *påntV / X *pentV ‘path’
Loanwords: vowel correlations

Central mid → mid front
PIIr. *grdʰá- > Plr. *gərda- ↔ *kertä (?) > P *gört ‘house’

Back/central ↔ low front
pPIIr. *s(h)áytu- ↔ FP *säjtV ‘bridge’

Mid > low
PIIr. *ćruw-/*ćrw-? ↔ FU *ćarwə ‘horn’

pPIIr. *hősura- → P(I)Ir. *hásura- ↔ FU *asora (*asura/asəra?) ‘lord’
PIIr. *tərás > Plr. *taras ↔ FP *tarəs ‘through’
PIIr. *jóранya- > Plr. *jarany- > Clr. *zaranya- → *sarańV ‘gold/copper’ > Ug
PIIr. *wrtká- > Plr. *wəɾθka- ↔ Ma-P *wärkä ‘kidney’
Loanwords: vowel correlations

Unknown ➞ mid front
PIIr. *mákš- ‘fly, bee’ ➞ FU *mekšə (*mākʃə?) ‘bee’
PIIr. *árdʰá- ‘side, half’ ➞ FP *ertä

Unknown ➞ mid back
PIIr. *árya- ➞ FP *orja (*ārja) ‘slave’
PIIr. *warājʰá- ➞ F, Mo *woraćə (*wāraćə) ‘boar’
PIIr. *anćura- ➞ FU *ońćarə ‘tusk’
PIIr. *maća(ka)- ‘gnat’ > PlIr. *matsa- ➞ FSa *mača ‘worm, moth’
Conclusions: sounds

Correlation of U *o (*ā)/*a vs. *e (*ǟ)/*ä with PIE *o vs. *e > pPIIr. *æ vs. *a
is not really striking (counterexamples)
U *o ← pPIIr. *æ,a,ǣ,ā with no strong correlation
U *e,ā ← pPIIr. *æ statistically dominant, but not very compelling due to
overall frequency of PIE *e > pPIIr. *æ
U *a expected in any case
So do U front/back mid vowels really reflect front/back (p)PIIr./PIr. mid
vowels and thus an early date (or a special dialect)?
Depending on phonetics of Uralic vowel reconstruction,
still not clear enough
Conclusions: sounds

IIr. developments reflected in Uralic loans:

?(p)pPIIr. *l > PIr. *

?pPIIr. *e/o > pPIIr. *ä/a > PIr. *

pPIIr. *ã > PIr. *

pPIIr. = PIr. *ć > PIr. *c > CIr. *

PIIr. *k, *k > PIr. *

PPIr. *ə > PIr. *

Not reflected in early loans: PIr. *s > CIr. *h
Conclusions: strata of substitutions

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Thank you!

Kiitos!

Tack!

धन्यवादः