# Segment-tone interaction in the Baltic languages

Anna Daugavet

# Tones

- Tones (melodies, i.e. pitch contours) as means of referring to contrasts that may have a more complex realization (duration, phonation types etc.), possibly created by different metrical structures

# Theoretical issues

- genuine tones (pitch contours) do not interact with segments
- tone-segment interaction may point to tones being associated with more abstract properties that are also responsible for the difference in segments → accents, see Kehrein et al. (2018)

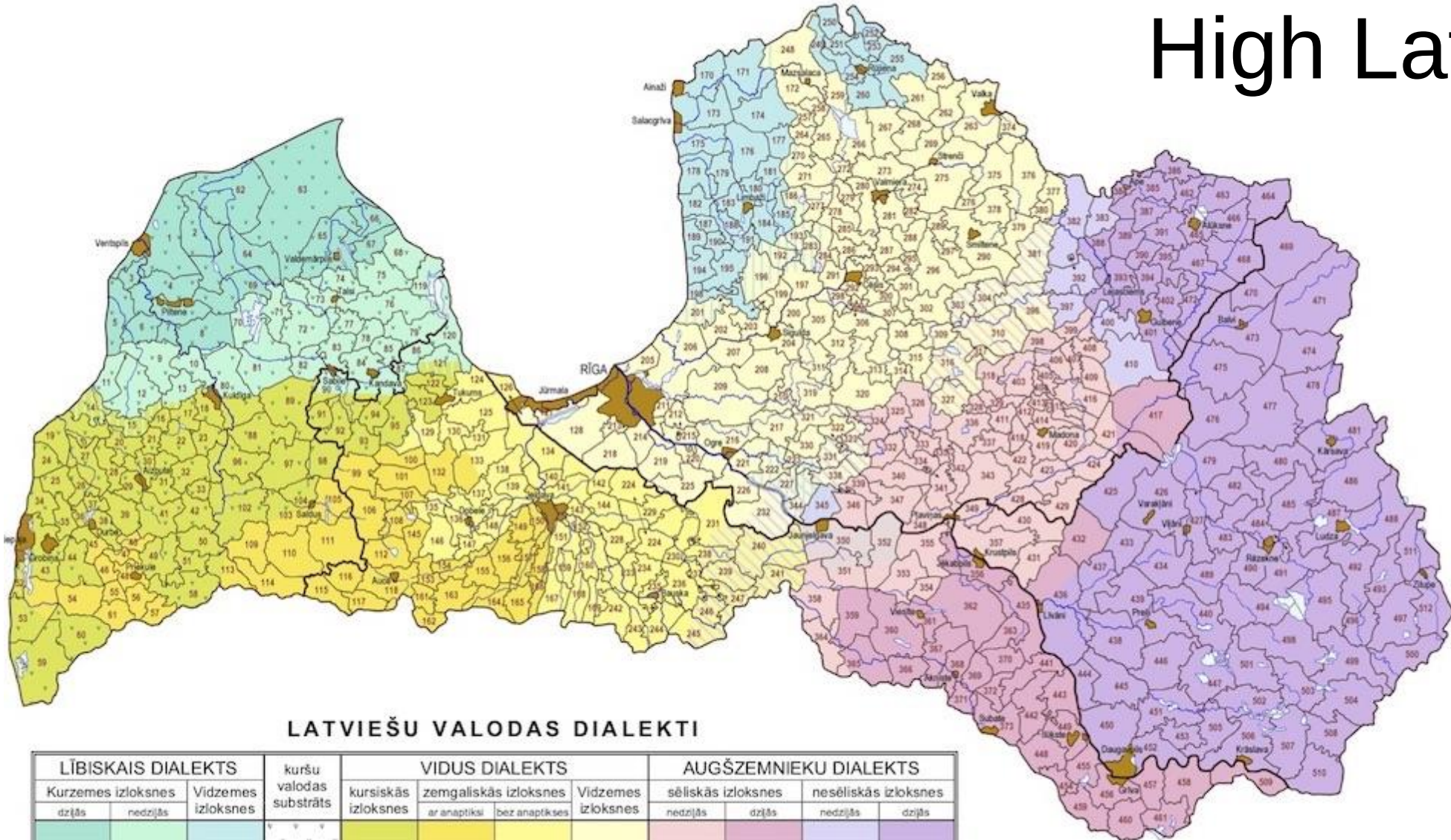
# Languages and dialects

- Baltic languages > Latvian > High Latvian
  “syllable accents”
- Franconian area (dialects of German and Dutch)
  “tonal accents”

# Structure

- tones / syllable accents
  - influence of syllable accents on vowel changes
  - emergence of closing diphthongs from high vowels
  - emergence of new high vowels from opening diphthongs
  - emergence of closing diphthongs from new high vowels
- influence of consonants on realization of syllable accents

# High Latvian




**LATVIEŠU VALODAS DIALEKTI**

| LĪBISKAIS DIALEKTS | | | kuršu valodas substrāts | VIDUS DIALEKTS | | | | AUGŠZEMNIEKU DIALEKTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kurzemes izloksnes | | Vidzemes izloksnes | | kursiskās izloksnes | zemgaliskās izloksnes | | Vidzemes izloksnes | sēliskās izloksnes | | nesēliskās izloksnes | |
| dziļās | nedziļās | | | | *ar anaptiksi* | *bez anaptikses* | | nedziļās | dziļās | nedziļās | dziļās |

M. Rudzīte. Darbi latviešu dialektoloģijā. — Rīga: LU, 2005. — 1. priekšlapa.

# High Latvian

- vowel shift
- tones or syllable accents
- consonants interact with syllables accents

# Tones / tonal accents / syllable accents etc

<table>
<tr><td rowspan="2">Central Latvian</td><td colspan="2">High Latvian</td></tr>
<tr><td>Latgalian*</td><td>Selonian</td></tr>
<tr><td>broken</td><td>broken</td><td>rising</td></tr>
<tr><td>falling</td><td colspan="2" rowspan="2">falling</td></tr>
<tr><td>level</td></tr>
</table>

pitch contours vs phonation type

# Tones / tonal accents / syllable accents etc

| | falling | rising |
|---|---|---|
| long vowels | *kaː.ja* ‘leg’ | *aː.da* ‘skin’ |
| diphthongs | *loiks* ‘time’ | *loist* ‘let go’ |
| diphthongal sequences | *mon.ta* ‘belongings’ | *mol.ka* ‘firewood’ |

examples from Hauzenberga (1934)

typological parallel: Franconian accents

# Typological parallels: Franconian accents


map from Peters (2007: 168)

# Franconian tonal accents (Cologne)

| | falling Accent 1 | high level Accent 2 |
|---|---|---|
| V: | *daːx* ‘day’ dat | *daːx* ‘day’ nom |
| VV | *braut* ‘brew’ 3sg.prs | *braut* ‘bride’ |
| VR | *kan* ‘can, bottle’ | *kan* ‘be able’ sg |

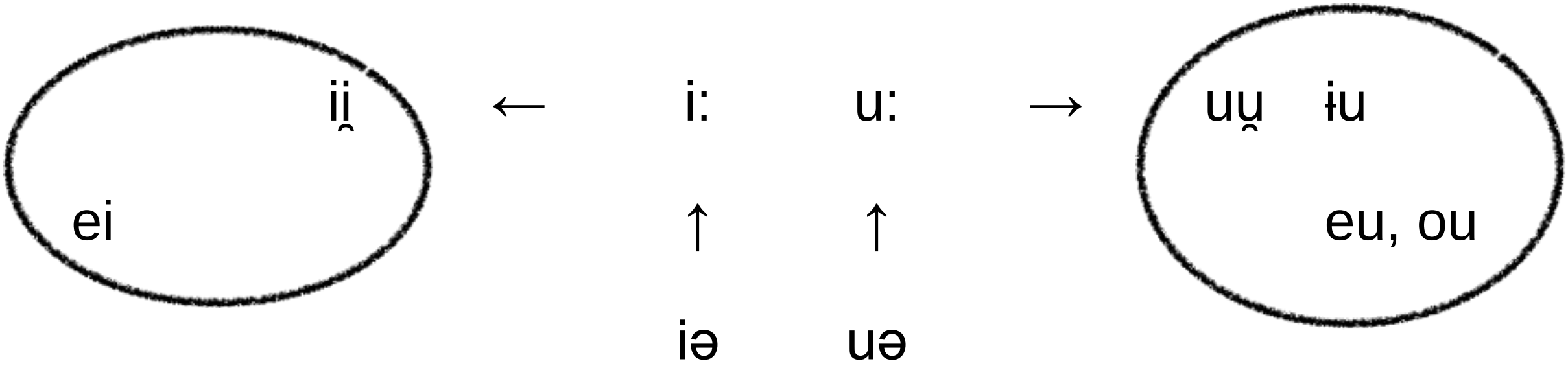
examples from Peters (2006)

# Accents interact with vowels and consonants

- accents have influence over the quality of vowels
- consonants cause modification of accents

consonants → ACCENTS → vowels

# Vowel shift in High Latvian (fragment)

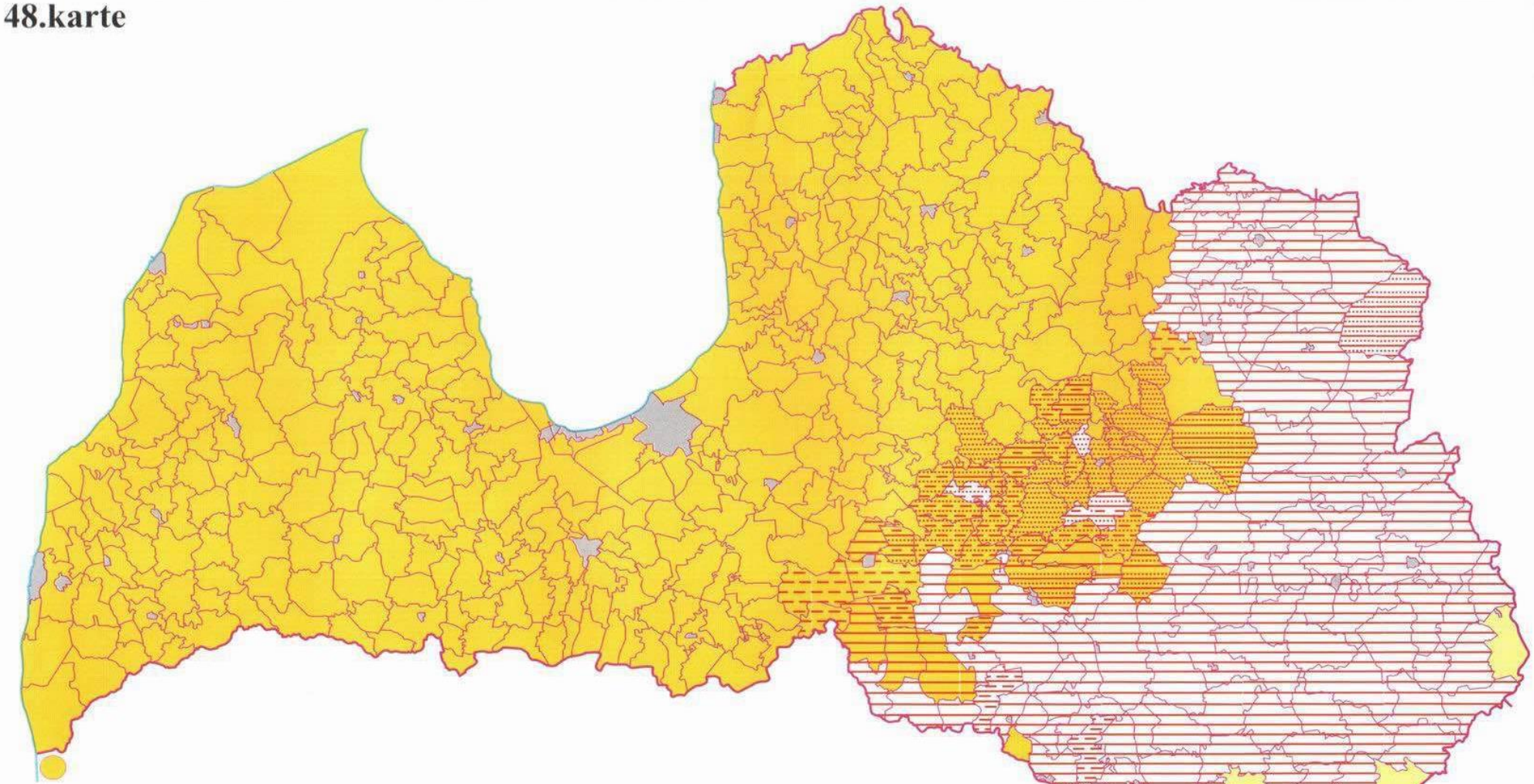



1) long high vowels > closing diphthongs
2) opening diphthongs > long high vowels

# Prototypical High Latvian (“deep” Latgalian)

| Central Latvian | High Latvian (front vowels) | |
|---|---|---|
| | falling | broken |
| i: | *reit* ‘swallow’ inf | *reit* ‘tomorrow’ |
| iə | *si:nu* ‘hay’ acc | *si:nu* ‘wall’ acc |

# 48.karte



45.jaut. **Saknes zilbju vokālisms. Patskanis** *ī* : *vīrs, rīts, dzīvs*

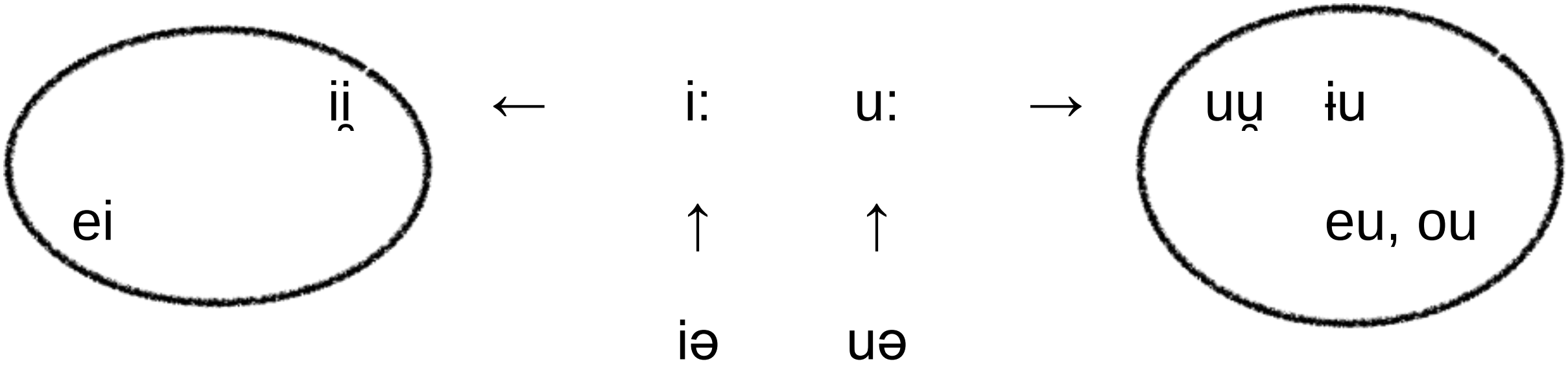
*ī*

*ei*

*ij*

$^{e}ī$

# Vowel shift (fragment)




1) <u>long high vowels > closing diphthongs</u>
2) opening diphthongs > long high vowels

# Long high vowels > closing diphthongs

the initial stage of the change *i:* > *i̯i* > *ᵉi̯i*, *u:* > *u̯u* > *ᵒu̯u*

| falling | | rising |
|---|---|---|
| *i̯i* or *ᵉi̯i* | *ti̯irs* ‘clean’ | *i:* |
| *u̯u* or *ᵒu̯u* | *tsu̯uka* ‘pig’ | *u:* |

Hauzenberga (1934) and other contemporary sources

# Controversy (lack of data)

1. Lack of good examples, especially for the other accent where the change is absent.
2. Counterexamples under the ‘wrong’ accent in the same sources (Hauzenberga 1934, Ozoliņa 1937).
3. No confirmation from later sources (Poiša 1985, 1999) — was the change generalized in the course of the 20th century?

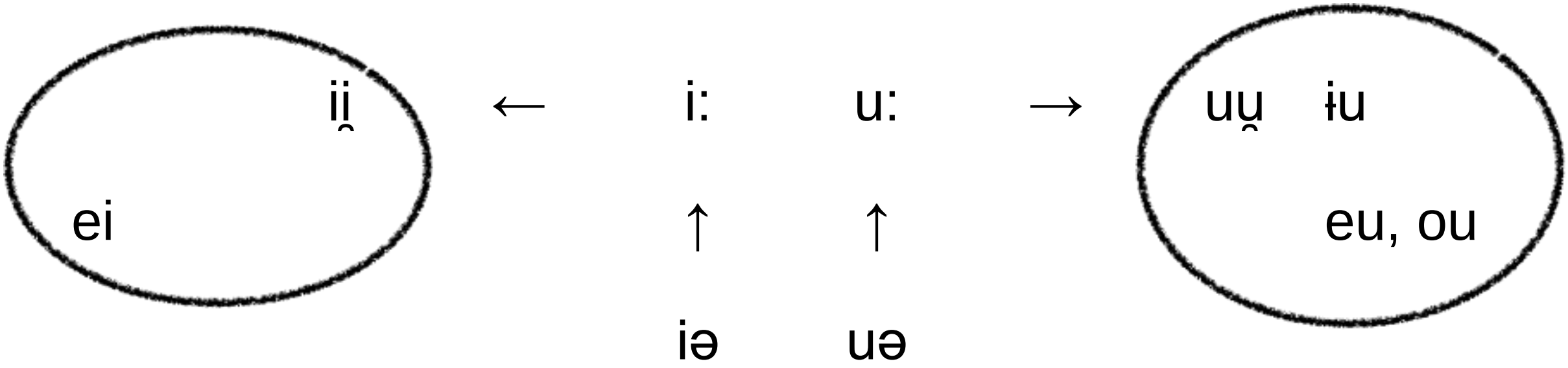
# Controversy (front vs back vowels)

4. Some of the earlier reports (Kauliņš 1923; Īvena 1928; Zariņš 1931) only mention the change for the front vowel.
5. The Latvian Dialect Atlas (Sarkanis 2013) states different reflexes of the back vowel under the different accents (but only one reflex of the front vowel!) — was the back vowel affected later?
6. No noticeable difference between the two maps…

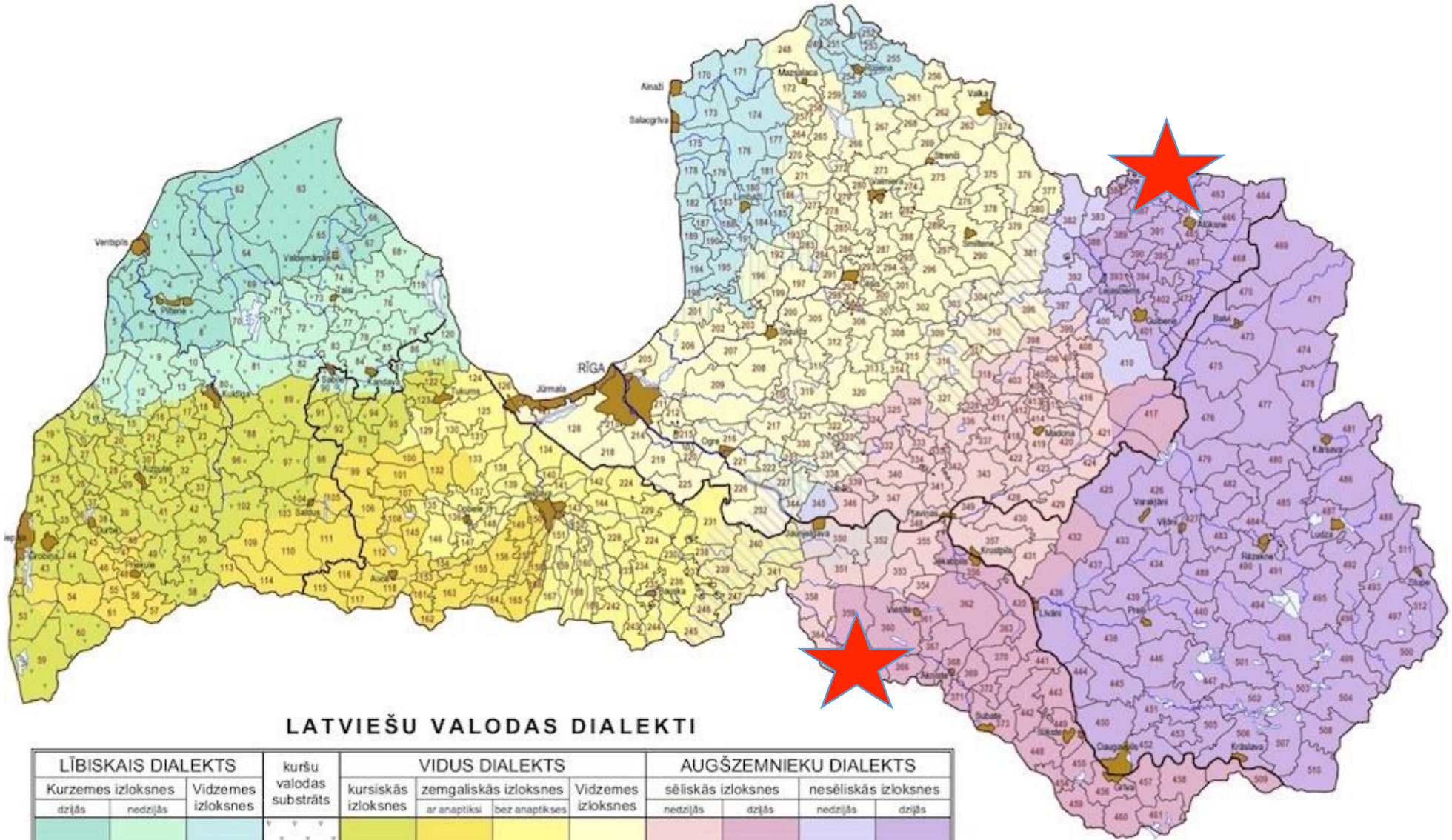
# Conclusion on diphthongization

The involvement of the accents in the diphthongization of high vowels should be considered only a tendency that was able to affect earlier stages of the process in some parts of the area but became eliminated at a later stage.

# Vowel shift (fragment)




1) long high vowels > closing diphthongs
2) <u>opening diphthongs > long high vowels</u>




## LATVIEŠU VALODAS DIALEKTI

| LĪBISKAIS DIALEKTS | | | kuršu valodas substrāts | VIDUS DIALEKTS | | | | AUGŠZEMNIEKU DIALEKTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kurzemes izloksnes | | Vidzemes izloksnes | | kursiskās izloksnes | zemgaliskās izloksnes | | Vidzemes izloksnes | sēliskās izloksnes | | nesēliskās izloksnes | |
| dziļās | nedziļās | | | | *ar anaptiksi* | *bez anaptikses* | | nedziļās | dziļās | nedziļās | dziļās |

M. Rudzīte. Darbi latviešu dialektoloģijā. — Rīga: LU, 2005. — 1. priekšlapa.

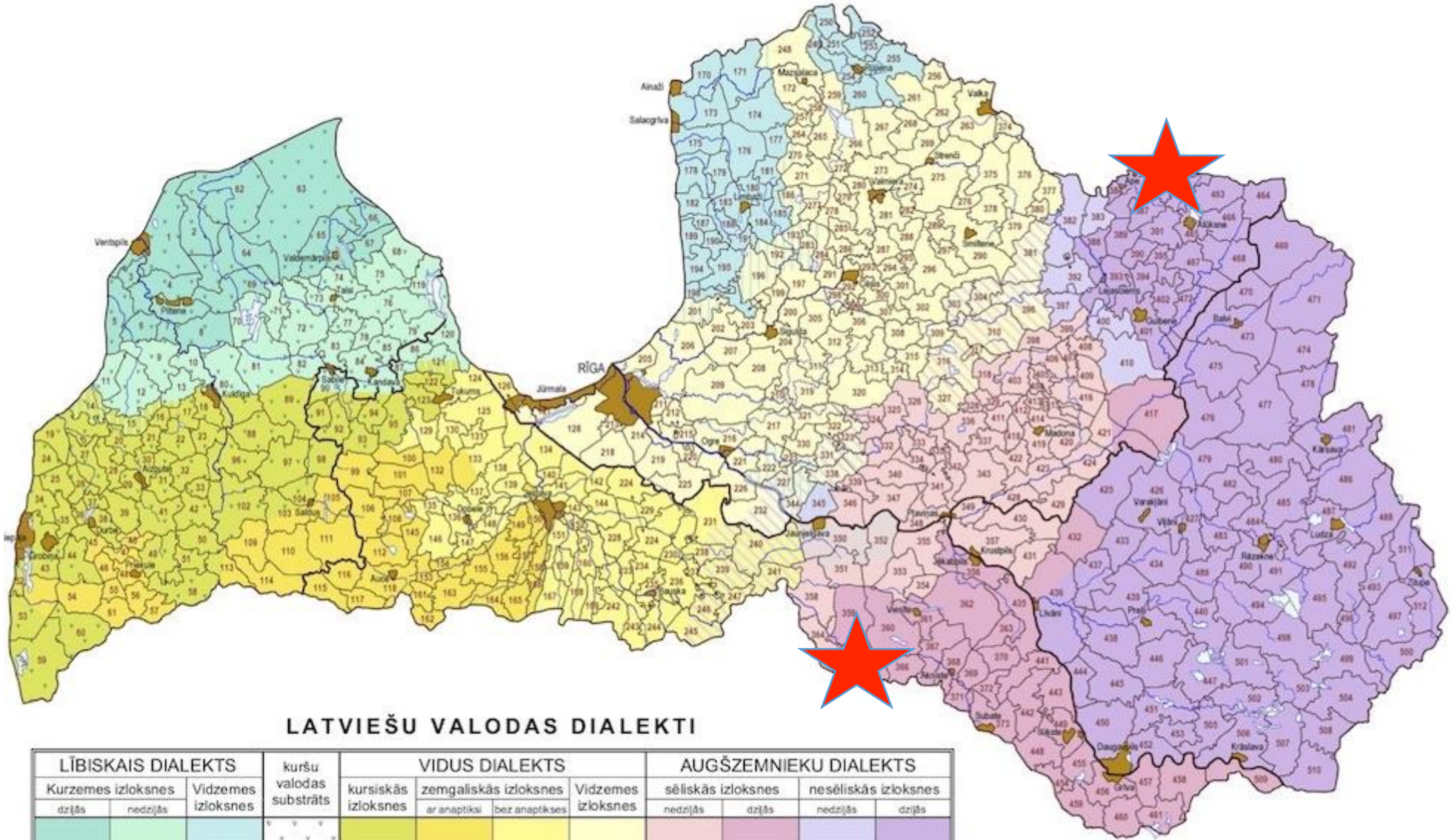
# Nereta (Selonian)

| Central Latvian | falling | rising |
|---|---|---|
| i: | *t**ei**rs* ‘clean’ | *tr**ei**s* ‘three’ |
| u: | *p**ou**rs* ‘dowry’ | *b**ou**t* ‘be’ |
| iə | *diəna* ‘day’ | *vi:na* ‘one’ fem |
| uə | *uətris* ‘second’ | *du:t* ‘give’ |

examples from Meņģele (1939)

# Front vs back vowels

The Latvian Dialect Atlas (Sarkanis 2013) claims the monophthongization of the back vowel only in Sece and Sēlpisl — was the back vowel affected later?




## LATVIEŠU VALODAS DIALEKTI

| LĪBISKAIS DIALEKTS | | | kuršu valodas substrāts | VIDUS DIALEKTS | | | | AUGŠZEMNIEKU DIALEKTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kurzemes izloksnes | | Vidzemes izloksnes | | kursiskās izloksnes | zemgaliskās izloksnes | | Vidzemes izloksnes | sēliskās izloksnes | | nesēliskās izloksnes | |
| dziļās | nedziļās | | | | *ar anaptiksi* | *bez anaptikses* | | nedziļās | dziļās | nedziļās | dziļās |

M. Rudzīte. Darbi latviešu dialektoloģijā. — Rīga: LU, 2005. — 1. priekšlapa.

# Mazlaicene (Latgalian*)

| Central Latvian | falling | broken |
|---|---|---|
| i: | *t**ei**rs* ‘clean’ | *r**ei**ts* ‘morning’ |
| u: | *ts**ou**ka* ‘pig’ | *b**ou**t* ‘be’ |
| iə | *si:va* ‘wife’ | *seina* ‘wall’ |
| uə | *zuəbi* ‘teeth’ | *ougas* ‘berries’ |

examples from Ābele & Lepika (1928)

# Mazlaicene (Latgalian*)

| *i:*, *u:* | *ei*, *ou* | *ei*, *ou* |
|---|---|---|
| broken *iə*, *uə* | broken *i:*, *u:* | |
| falling *iə*, *uə* | falling *i:*, *u:* | falling *i:*, *u:* |

repetitive diphthongization of high vowels — old and new ones

# Diphthongization under different accents

<table>
<tr><th>CL</th><th>“non-deep” HL</th><th>Nereta</th><th>“deep” HL</th><th>Mazlaicene</th></tr>
<tr><td>falling i:, u:</td><td>i̯i, u̯u</td><td colspan="3" rowspan="2">ei, ou</td></tr>
<tr><td colspan="2">broken/rising i:, u:</td></tr>
<tr><td colspan="2">broken/rising iə, uə</td><td colspan="2">broken/rising i:, u:</td><td>ei, ou</td></tr>
<tr><td colspan="3">falling iə, uə</td><td colspan="2">falling i:, u:</td></tr>
</table>

edited version from Seržant (2005: 45-46)

# Līvāni vs Mazlaicene

| Līvāni Trumpa (2012: 214) | | | | |
|---|---|---|---|---|
| falling | *riət* | *ri:t* | *rii̯t* | ‘swallow’ inf |
| rising | *riət* | *ri:t* | *ri:t* | ‘tomorrow’ |
| | | | | |
| Mazlaicene (Seržant 2005: 45-46) | | | | |
| falling | *siəva* | *si:va* | *si:va* | ‘wife’ |
| broken | *siəna* | *si:na* | *seina* | ‘wall’ |

# Rising vs broken

| Selonian | | Latgalian* | |
|---|---|---|---|
| pitch contours | | phonation type | |
| falling | **rising** | falling | **broken** |
| shorter | **longer** | longer | **shorter** |
| Līvāni | | Mazlaicene | |
| *riiṯ* | *ri:t* | *si:va* | *seina* |
| swallow’ inf | tomorrow’ | wife’ | wall’ |

see Trumpa (2012) on the durational differences between the High Latvian accents and their influence on vowel quality

# Duration and vowel quality

- High vowels tend to become diphthongs earlier in shorter syllables (under the falling accent in Selonian and under the broken accent in Mazlaicene)
- High vowel tend to become monophthongs earlier in longer syllables (under the rising accent in the Selonian Nereta!)
- Phonetic explanation?

# Typological parallels: Franconian accents


map from Peters (2007: 168)

# Franconian tonal accents (Cologne)

| | falling Accent 1 | high level Accent 2 |
|---|---|---|
| V: | *daːx* ‘day’ dat | *daːx* ‘day’ nom |
| VV | *braut* ‘brew’ 3sg.prs | *braut* ‘bride’ |
| VR | *kan* ‘can, bottle’ | *kan* ‘be able’ sg |

examples from Peters (2006)

# Diphthongization in Maastricht

| | falling Accent 1 | high level Accent 2 |
|---|---|---|
| | shorter | longer |
| high [L SEP] vowels | *blɛif* ‘stay’ 1sg.prs | *bliːvə* ‘stay’ inf |
| | *dɔuf* ‘pigeon’ sg | *duːvə* ‘pigeon’ pl |
| middle vowels | *ɣəbeit* ‘territory’ | *ɣəbeːt* ‘set of teeth’ |
| | *spøylə* ‘rinse’ | *spøːlə* ‘play’ |

examples from Köhnlein (2018: 215),

see also Gussenhoven (2012) on duration

# Conclusions on vowels

- The tendency of high vowels to become diphthongs under a shorter accent is confirmed by the data from a typologically similar system. Is it all about duration?
- Different metrical structures behind the pitch contours of the accents also explain the difference between diphthongs and monophthongs in Franconian, see Köhnlein (2018) and other contributions to Kehrein (2018)
- Should we try the same approach to (High) Latvian?

# Accents interact with vowels and consonants

- accents have influence over the quality of vowels
- consonants cause modification of accents

consonants → ACCENTS → vowels

# Interaction between accents and consonants

| Latgalian* | Selonian |
|---|---|
| broken | rising |
| **falling**<br>• rising-falling before voiced consonants<br>• steeply falling before voiceless consonants | |

see Markusa (1993); Poiša (1985, 1999), Ābele & Lepika (1928) et al.

# Universal tendencies

- Vowels are generally longer before voiced consonants than before voiceless consonants
- Shorter duration is accompanied by faster changes in the pitch contour which leads to a more abrupt fall

# Interaction between accents and consonants

- The falling accent is influenced by the following consonant in the same areas where the accents influence vowel quality
  - Selonian (falling *i: > i̯i̯*, *u: > u̯u̯)*
  - Latgalian* in Mazlaicene (broken *iə*, *uə* > *i:*, *u: > ei*, *ou* )
- The accents influence vowel quality irrespectively of the following consonants!
- The two changes are independent from each other.

# The falling accent before voiceless consonants

| Selonian<br>(falling *iː* > *i̯i̯*, *uː* > *u̯u̯*) | Latgalian* in Mazlaicene<br>(broken *iə*, *uə* > *iː*, *uː* > *ei*, *ou*) |
|---|---|
| syllable types | |
| all nuclei | closing diphthongs only! |
| non-modal phonation | |
| breathy voice | glottal stop? |

# Phonation types

| depend on the configuration of vocal folds | |
|---|---|
| modal voice | neutral |
| glottalization/creaky voice | vocal folds are closed/strained |
| breathy voice | vocal folds are relaxed |

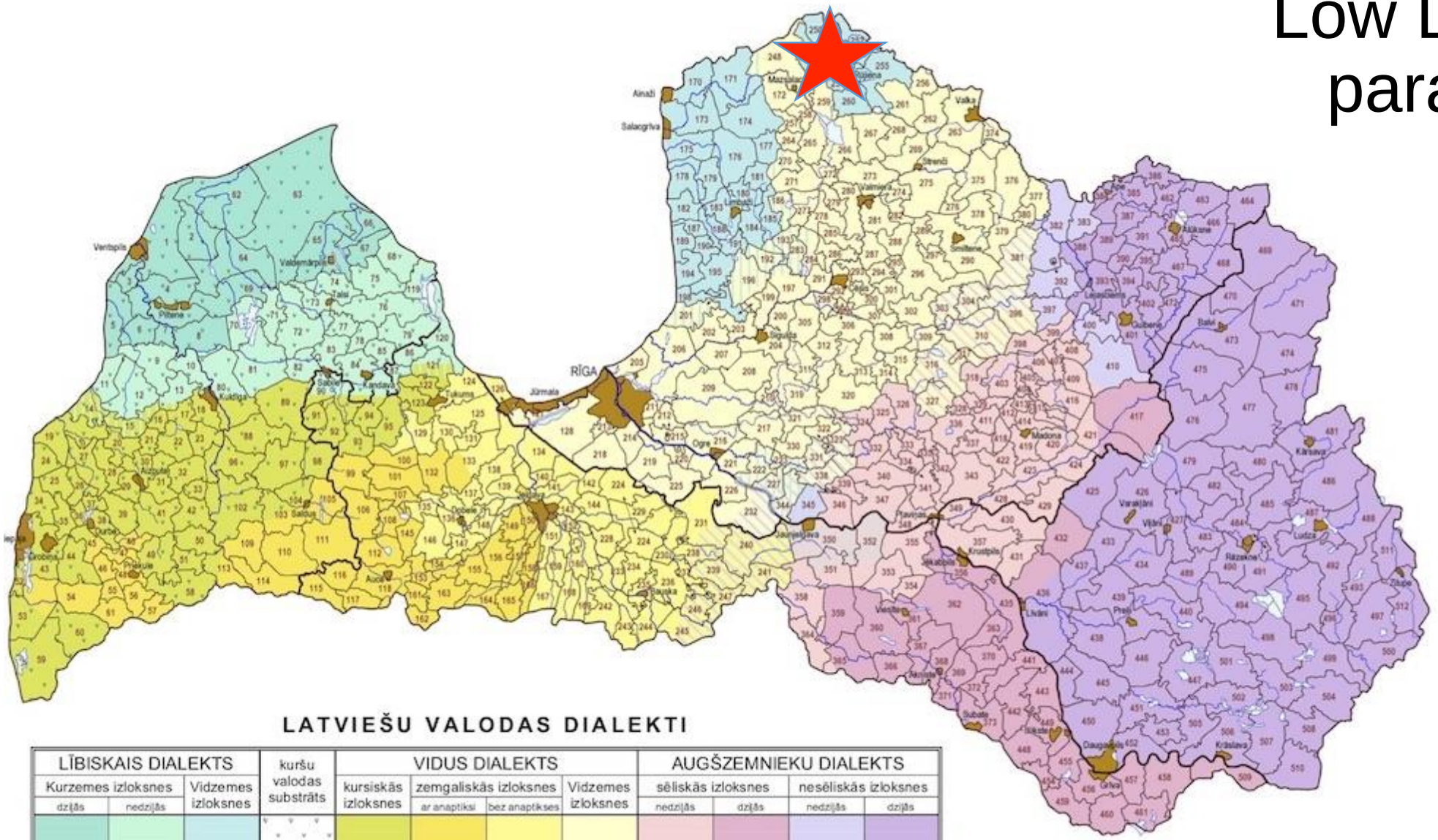
# The falling accent before voiceless consonants

- In Selonian the steep fall before a voiceless consonant is accompanied by breathy voice (Rudzīte 1964: 312) — see Gordon & Lagefoged (2001: 393) for typological parallels
- The acoustic analysis by Markusa (1993: 98) finds glottalization
- The two ways of transcribing the pronunciation may show to both: *ma:sa* > *ma:ˣsa* ’sister’, *su:ti:t* > *su:ktit* ‘send’

# The falling accent before voiceless consonants

- In Selonian the steep fall before a voiceless consonant is accompanied by breathy voice (Rudzīte 1964: 312) — see Gordon & Lagefoged (2001: 393) for typological parallels
- The acoustic analysis by Markusa (1993: 98) finds glottalization
- The two ways of transcribing the pronunciation may show to both: *ma:sa* > *ma:ˣsa* ’sister’, *su:ti:t* > *su:ktit* ‘send’

# Low Latvian parallels




**LATVIEŠU VALODAS DIALEKTI**

| LĪBISKAIS DIALEKTS | | | kuršu valodas substrāts | VIDUS DIALEKTS | | | | AUGŠZEMNIEKU DIALEKTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kurzemes izloksnes | | Vidzemes izloksnes | | kursiskās izloksnes | zemgaliskās izloksnes | | Vidzemes izloksnes | sēliskās izloksnes | | nesēliskās izloksnes | |
| dzijās | nedzijās | | | | *ar anaptiksi* | bez anaptikses | | nedzijās | dzijās | nedzijās | dzijās |

M. Rudzīte. Darbi latviešu dialektoloģijā. — Rīga: LU, 2005. — 1. priekšlapa.

# Low Latvian parallels (Rūjiena)

| voiceless, nom | voiced, gen | |
|---|---|---|
| falling | broken | |
| *rauks* | *rauga* | ‘yeast’ |
| *drauks* | *drauga* | friend’ |

cf. Standard Latvian

*drauks*, *drauga* (falling) and *rauks*, *rauga* (broken)

based on Ābele (1931), Andronov (1996: 204-206)

# Low Latvian parallels (Vecate vs Mazsalaca)

| | before voiceless consonants |
|---|---|
| Vecate | falling > broken |
| Mazsalaca | broken > falling |

see Andronov (1996: 204-206)

No necessary connection between the glottalization and the type of the following consonant!

# Typological parallels: Franconian accents


map from Peters (2007: 168)

# Franconian tonal accents (Cologne)

| falling Accent 1 | high level Accent 2 |
|---|---|
| voiced consonant | voiceless consonant |
| bliivə ‘stay’ inf | biisə ‘bite’ inf |
| ʃʁuuvə ‘screw’ inf | buusə ‘outside’ |
| ʁeizə ‘travel’ inf | ʃleifə ‘drag’ inf |
| ouɣə ‘eyes’ | loufə ‘run’ inf |

examples from Kehrein (2018: 150)

# Selonian vs Franconian (Cologne)

| | voiced | voiceless |
|---|---|---|
| Selonian | rising-falling | abruptly falling |
| Shorter duration before a voiceless consonant is accompanied by faster changes in the pitch contour. | | |
| Franconian | falling | level high |
| Voiceless consonants heighten the pitch of adjacent vowels; voiced consonant lower the pitch of adjacent vowels. | | |

# Conclusion on consonants

- The phonetic mechanism behind the differences in tonal contour and phonation type under the influence of following consonants is different in High Latvian and the Franconian, and can also be different within Latvian (phonation type).

# Interaction between segments and accents

- Diphthongization under a shorter accent
- Modification of tonal contours under the influence of following consonants may be direct (Franconian) or work through durational differences (High Latvian)
- No evident connection between phonation types and consonant types

# Further goals

- Comparative analysis of the accent in Baltic and Franconian
- Franconian-like interpretation of the Baltic accents?