

Acoustic correlates of stress in Udmurt verbs: variation and theoretical implications

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- Udmurt (Uralic, Permic) has fixed **final** stress (Yemelyanov 1927; GSUJa I 1962; Denisov 1980; Winkler 2001)
- Morphologically conditioned exceptions with **initial** stress:
 - imperative verbs
 - negated indicative verbs
 - reduplicated adjectives
 - etc.

Possible interpretations

Hypothesis 1:

Final stress is word stress, **initial** “stress” is a phrasal intonational phenomenon.

Hypothesis 2:

Initial stress is word stress, default **final** “stress” is absence of stress.

Hypothesis 3:

Both **initial** and **final** stresses represent word stress.

Object of study

- Minimal pairs consisting of:

indicative verbs (PRS.3SG)

imperative verbs (IMP.2SG/PL)

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- Minimal pairs consisting of:

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final stress

imperative verbs (IMP.2SG/PL)

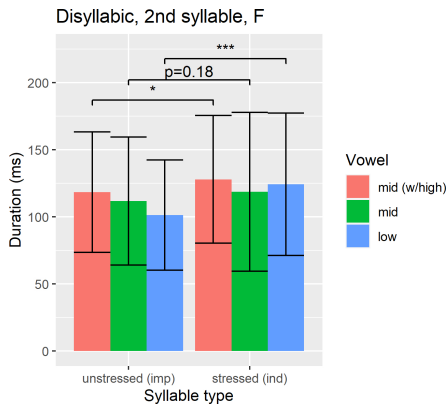
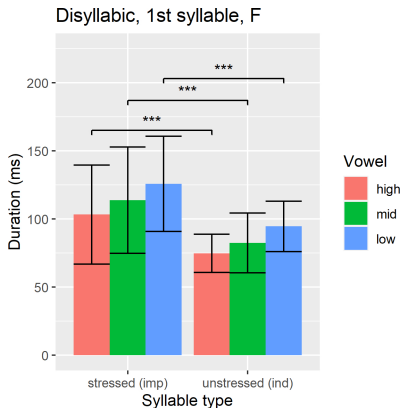
initial stress

Materials, participants, measurements

- String-identical **indicative** and **imperative** verbs (total n=172, CV syllables), grouped by:
 - syllable count: di-, trisyllabic
 - vowel height: low, mid, high
 - information structure: focused (F), non-focused (non-F)
- 6 native speakers (5 f, 1 m; age 20–40)
- Measurements:
 - vowel **duration**
 - vowel **quality (F1 and F2)**
 - **f₀**

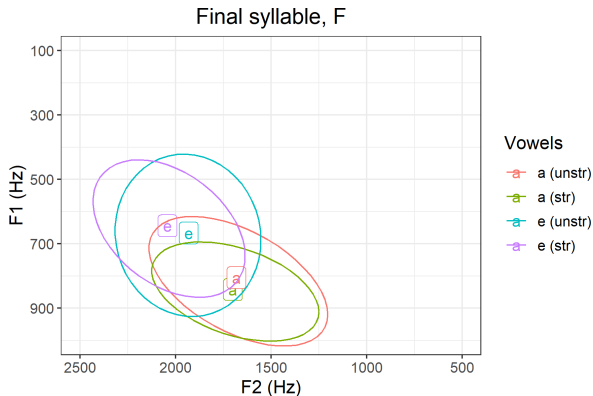
Results: vowel duration

- **Initial** stress is systematically cued by vowel duration
- **Final** stress is less so



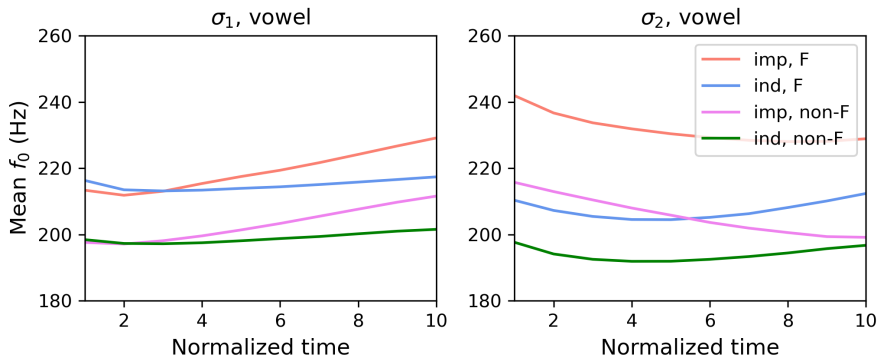
Results: vowel quality (final syllables)

- Stressed and unstressed /a/ systematically differ in **F1** values ($p < 0.001^{***}$)
- Stressed and unstressed /e/ systematically differ in **F1** and **F2** values ($p < 0.01^{**}$ and $p < 0.001^{***}$, respectively)



Results: f_0

- **Imperatives** carry \mathbf{H}^* on the initial syllable (delayed till the juncture with the second syllable)
- **Indicatives** carry $(\mathbf{H}+)\mathbf{L}^*$ or \mathbf{H}^* on the final syllable
- Focused contexts have **higher overall f_0** values



Main findings

- The results support **Hypothesis 3**:
both **initial** and **final** stresses represent word stress

	vowel duration	vowel quality
initial stress	✓	✓
final stress		✓

- Both types of stress are aligned with **pitch accents**

In the long version/discussion...

- **Inter-speaker variation (!):**
 - individual speakers may rely on **vowel duration** and/or **vowel quality** to cue stress
 - may (not) differentiate stress- and IS-based minimal pairs with f_0
- More details on the **data and analysis**
- Comparison with **previous studies** on stress in Udmurt (Baitchura 1973; Lytkin & Tepliashina 1962; Denisov 1980)
- **Theoretical significance**

Thank you for your attention!

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