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Investigating predictors of foreign accentedness in L3 acquisition

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Introduction

- Ratings of perceived global foreign accent
  - widely applied in SLA research (Flege1988; Piske et al. 2001)
  - but less frequently in TLA (but see Wrembel 2015).
- L3 rating studies focus mostly on heritage speakers (Lloyd-Smith et al. 2017; Lloyd-Smith 2021).
- Factors contributing to a perception of accentedness:
  - amount of L1 use,
  - AoA in the L2 country,
  - non-native segmental features in the speech samples.

Theoretical framework

- **Natural Growth Theory of Acquisition (NGTA)** (Dziubalska-Kołaczyk & Wrembel 2022) is holistic; both linguistic and extralinguistic factors account for the process of multilingual acquisition.

- Main assumptions: gradual dynamic emergence of Ln phonology; shaped by input from the L1 and other Ls; influenced by typology, universal preferences, context.

- NGTA relies on principled explanations as well as inductive, data-driven accounts.

- NGTA is grounded in Natural Phonology (e.g. Donegan & Stampe 2009; Dziubalska-Kołaczyk 2012) and enhanced by Complexity Theory (Kretzschmar 2015).

Aims

- To contribute to research on L3 phonetics and phonology.

- To explore how a perceived global accent in L3 is correlated with the general proficiency level, oral fluency and fine-grained phonetic performance.

- To apply the hierarchy of variables as proposed by NGTA.

Study

- Part of a larger project investigating multilingual acquisition in L1 Polish – L2 English – L3 Norwegian learners

  - Cross-linguistic influence in multilingualism across domains: Phonology and syntax

- Longitudinal design (T1, T2, T3)

Study design: participants

- **Speakers (N=24)**
  - L1 Polish, L2 English, L3 Norwegian
  - aged 21
  - 8 weeks of initial exposure to the L3 in a formal setting
- **Raters (N=30)**
  - 18 Norwegian native speakers
  - 12 highly proficient L2 speakers of Norwegian
  - some phonetic training
  - moderate to considerable previous experience with foreign-accented speech in Norwegian

Measures

- **Profile**: Language History Questionnaire (Li et al. 2006)

- **L3 Proficiency**: Norwegian placement test

- **Amount/frequency of L3 use**: a composite score based on self-declared answers in LHQ

- **Oral reading fluency**: number of words per minute (wpm)

- **Fine-grained phonetic performance**: VOT durations in /p, t, k/ in word list reading in L3

- **Rating parameters** (on a 9-point scale):
  - degree of foreign accentedness
  - comprehensibility

Study design: speech samples

- Excerpts from *The North Wind and the Sun*

- Read in L3 Norwegian

- 48 words long

- 30 speech samples

  – 24 L3 learners

  – 6 Norwegian controls

  – presented to the raters in a randomized order

Online rating survey in Qualtrics

Rate the following speech sample according to the questions below, feel free to use the whole scale:

Q1: How much of a foreign accent does this speaker have?
1 = No foreign accent | 9 = Strong foreign accent

Q2: How comprehensible is this speech sample to you?
1 = Very comprehensible | 9 = Not comprehensible at all

▶ ⬤————— 0:00 / 0:10 🔊 ———⬤

	1	2	3	4	5	6	7	8	9
How much of a foreign accent does this speaker have?	○	○	○	○	○	○	○	○	○
How comprehensible is this speech sample to you?	○	○	○	○	○	○	○	○	○

Research questions

- **RQ1:** Do the rating parameters (accentedness and comprehensibility) correlate with one another?

- **RQ2:** Does perceived global accent correlate with the learners' proficiency level, oral fluency and fine-grained phonetic performance in the L3?

- **RQ3:** Does perceived comprehensibility correlate with the learners' proficiency level, oral fluency and fine-grained phonetic performance in L3 Norwegian?
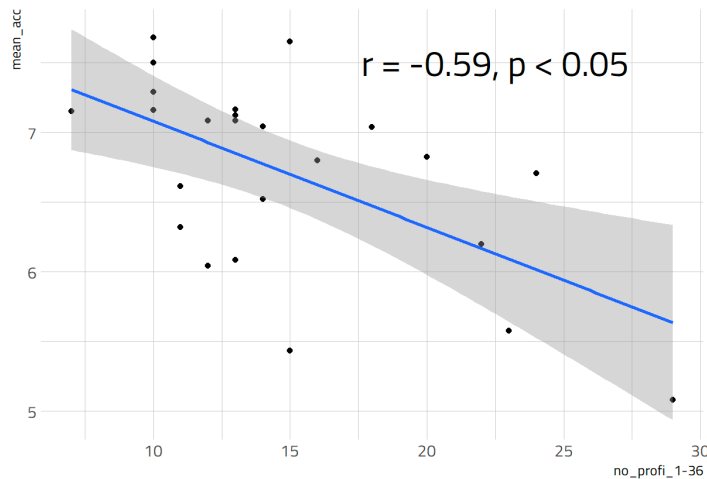
Results: Accentedness vs. comprehensibility

- Significant correlation between Accentedness and Comprehensibility
- The stronger the accent, the lower the comprehensibility
- **RQ1 – YES**

$r = -77$, $p < 0.05$
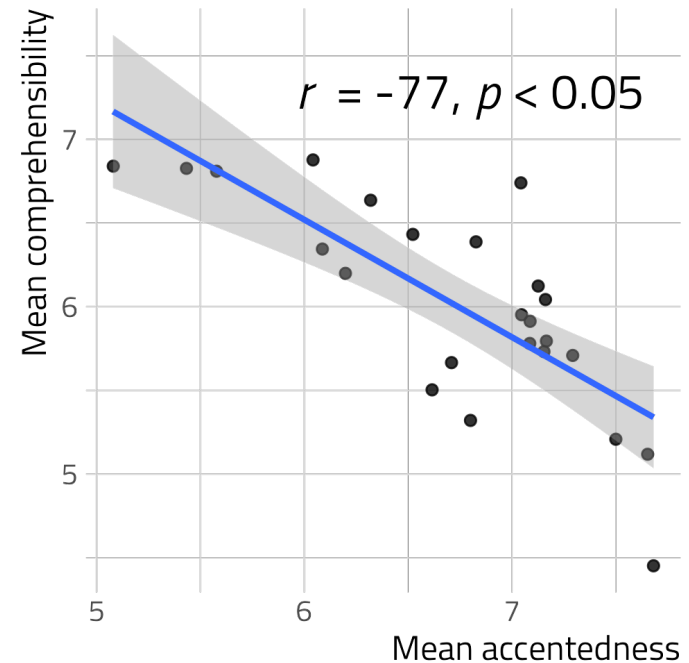
Results: Accentedness vs. factors

- Accentedness and L3 Proficiency
  - the higher the proficiency, the less accented

- Accentedness and Oral Fluency
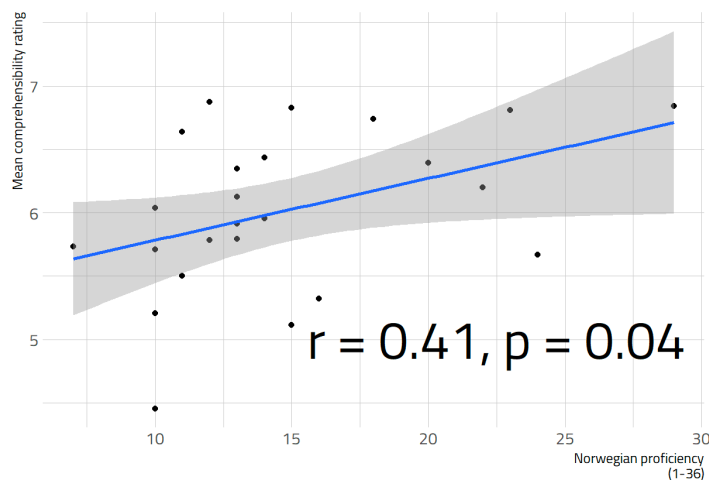 - the higher the speech rate, the less accented it is perceived to be

r = -0.59, p < 0.05

r = -0.59, p < 0.05
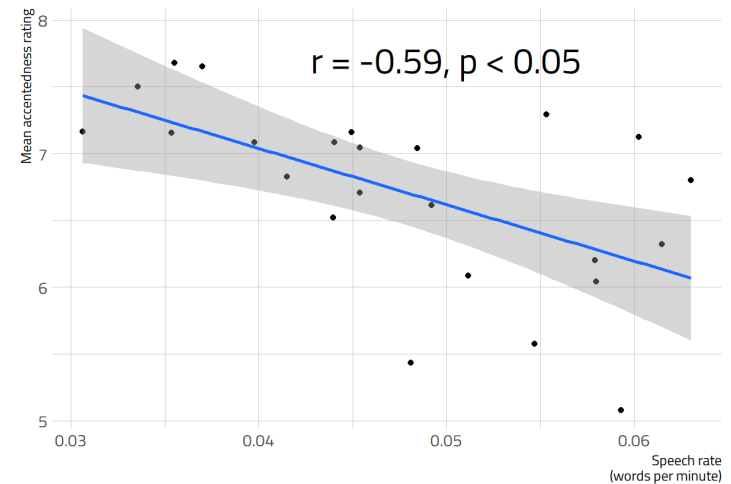
- No correlation between accentedness and VOT measures

- **RQ 2 -> partially yes**

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Results: Comprehensibility vs. factors

- Comprehensibility and L3 Proficiency
  - The higher proficiency, the better the comprehensibility

r = 0.41, p = 0.04

- Comprehensibility and Oral Fluency
  - The higher the speech rate, the higher the comprehensibility rating

r = 0.51, p < 0.05
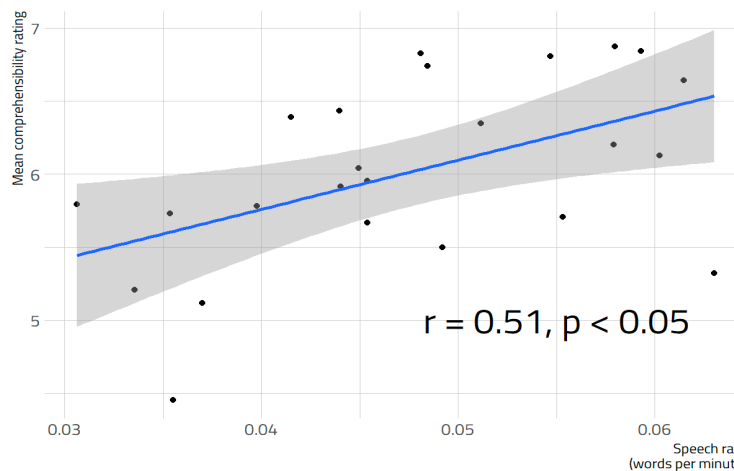
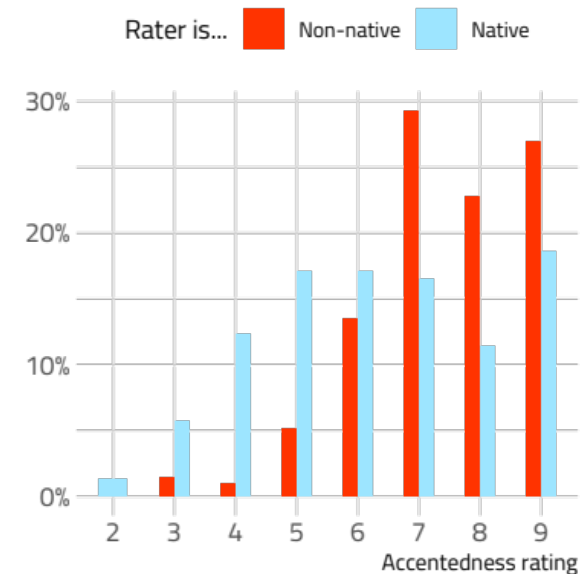- No correlation between Comprehensibility and VOT measures

- **RQ 3 -> partially yes**

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Results: rater variables

- Mixed-effects ordinal logistic regression model:
  - Accentedness as a function of Nativeness of Rater, with Norwegian Proficiency as control, and by-speaker and by-rater random intercepts

- Significant difference between native vs. non-native raters for Accentedness but not Comprehensibility

- **Interrater reliability**: Cronbach's alpha for Accentedness α = 0.89; for Comprehensibility α = 0.87
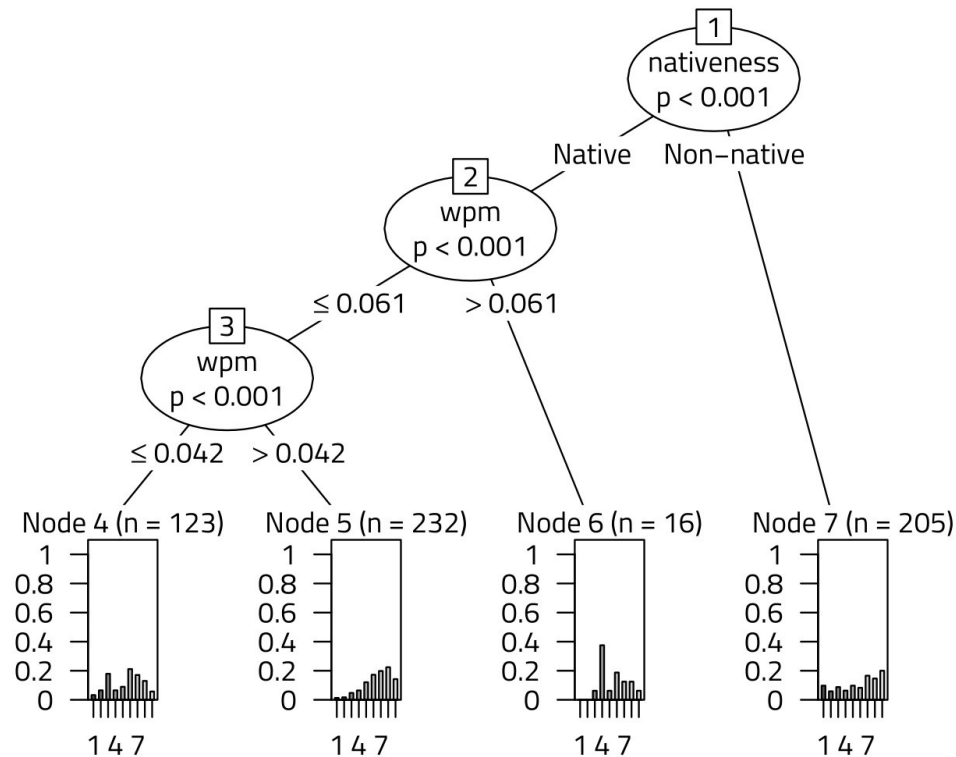
- A random forest analysis
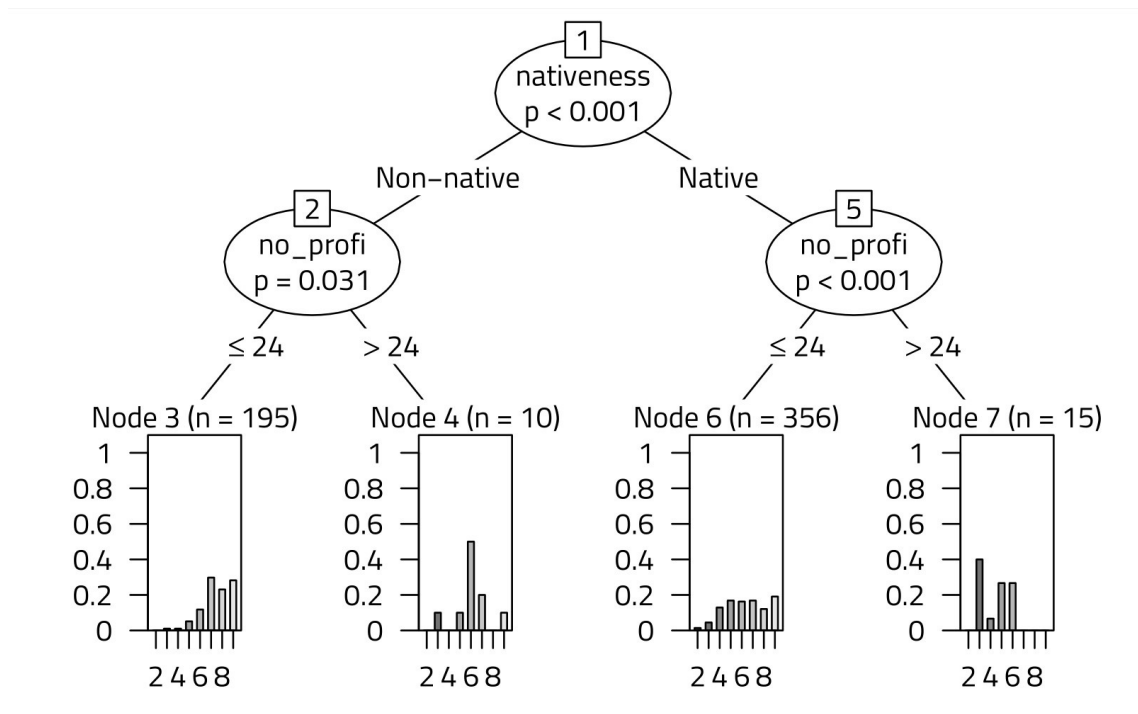
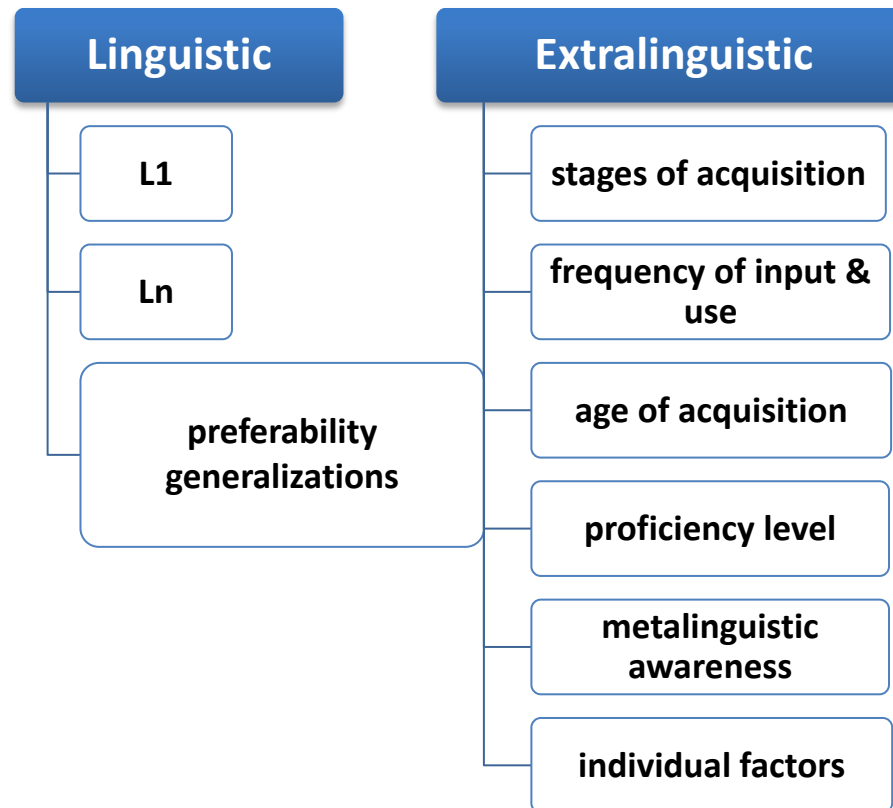# Results: predictors for Comprehensibility

- Conditional importance of predictors for Comprehensibility

Discussion

- Linguistic and extralinguistic variables in NGTA

Discussion

- **Linguistic:**
  - Raters' linguistic competence (native vs. non-native) -> the most significant predictor of ratings,
  - BUT fine-grained phonetic performance (VOT in L3) was not.
- **Extralinguistic:**
  - Oral Fluency and L3 Proficiency predicted Accentedness and Comprehensibility,
  - BUT the frequency of L3 use and interrater differences less important
- **Hierarchy of variables in the present study**
  - language-specific factors > oral fluency and proficiency > frequency of use and individual factors

Way forward

- Accent ratings in L2 and L3
- Formal vs. naturalistic learners
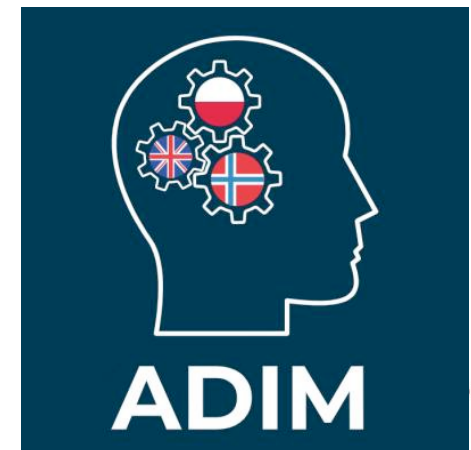- Speaking vs. reading mode

Acknowledgements

Thank you / Děkuji

Results

Parameters	Experimental group M (SD)	Control group M (SD)
Accentedness (1–9)	6.72 (1.8)	1.5 (1.5)
Comprehensibility (1–9)	6.03 (2.3)	7.8 (2.7)
Oral fluency (wpm)	0.05 (0.01)	–
VOT /p/ (ms)	44 (14)	–
VOT /t/ (ms)	62 (15)	–
VOT /k/ (ms)	74 (18)	–
Norwegian use (hrs/week)	4.2 (4.6)	–