

Predictors of foreign accentedness in L3

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Introduction

- Ratings of perceived global foreign accent widely applied in SLA research (e.g., Flege 1988; 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 rated speech samples.

Theoretical framework

- The **Natural Growth Theory of Acquisition (NGTA)** (Dziubalska-Kołaczyk & Wrembel 2022, forthcoming) 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 (preferability generalizations), context.
- NGTA relies on principled explanations (i.e. universal preferences stemming from general cognitive and semiotic principles) as well as inductive, data-driven accounts.
- NGTA follows a set of principles and is grounded in Natural Phonology (e.g. Donegan & Stampe 2009; Dziubalska-Kołaczyk 2012) and enhanced by Complexity Theory (Kretzschmar 2015).

Aims

- To explore to what extent a holistic assessment of global accent in L3 is correlated with the general proficiency level, oral fluency and fine-grained phonetic performance.
- To further verify the hierarchy of variables as proposed by NGTA.

Study design

- **Participants/speakers:** 24 speakers of L1 Polish, L2 English, L3 Norwegian, aged 21, 8 weeks of intense initial exposure to the L3 in a formal academic setting.
- **Instruments:** Norwegian placement test for proficiency; Language History Questionnaire (Li et al. 2006); online rating survey in Qualtrics.
- **Speech samples for rating:** Excerpts from *The North Wind and the Sun* read in Norwegian; 48 words long; 30 samples (24 L3 learners and 6 Norwegian controls) presented to the raters in a randomized order.
- **Measures:**
 - **L3 Proficiency:** A Norwegian placement test.
 - **Amount/frequency of L3 use:** Self-declared
 - **Oral reading fluency:** Words per minute (wpm).
 - **Fine-grained phonetic performance:** VOT in L3 word list reading including /p, t, k/ in stressed onset positions controlled for vocalic context; Norwegian VOT > Polish VOT.
- **Rating parameters:** degree of foreign accentedness and comprehensibility on a 9-point scale. (Fig. 1)
- **Raters:** Thirty raters (18 Norwegian native speakers, 12 highly proficient L2 speakers of Norwegian); with some phonetic training; moderate to considerable previous experience with foreign-accented speech in Norwegian.

Research questions

- **RQ1:** Do the parameters (accentedness and comprehensibility) correlate? Expected: heavier accent = lower comprehensibility.
- **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 and Comprehensibility, Pearson's $r = -0.77$: The stronger the accent, the lower the comprehensibility. **RQ1 – YES!** (Fig. 2)
- Accentedness and L3 Proficiency, Pearson's $r = -0.59$; Accentedness and Oral Fluency, $r = -0.59$: the higher the speech rate, the less accented it is perceived to be. **No correlations between perceived foreign accent and VOT measures. RQ2 – partially yes.** (Fig. 3)
- Comprehensibility and L3 Proficiency, Pearson's $r = 0.41$; Comprehensibility and Oral Fluency, $r = 0.51$: the higher the speech rate, the higher the comprehensibility rating. **No correlations between Comprehensibility and VOT measures. RQ3 – partially yes.** (Fig. 4)
- **Rater variables**
 - Native vs. non-native raters significant for Accentedness but **not** Comprehensibility. (Fig. 5)
 - 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.
 - Interrater reliability: Cronbach's alpha for Accentedness $\alpha = 0.89$; for Comprehensibility $\alpha = 0.87$ (*for 22 raters).
- Importance of predictors: a random forest analysis. (Fig. 6)

Discussion

The hierarchy of variables in the present study

- **Linguistic:** Rater status (native vs. non-native) was the most significant predictor of ratings (**red in Fig. 7**); i.e. the influence of the language-specific factors; whereas fine-grained phonetic performance (VOT durations) was **not** (**grey in Fig. 7**).
- **Extralinguistic:** Oral Fluency and L3 Proficiency (**green in Fig. 7**) predicted Accentedness and Comprehensibility, whereas the amount/frequency of L3 use, and interspeaker individual differences were of lesser importance (**grey in Fig. 7**).
- NGTA's hierarchy of factors in the acquisition situation analysed here is as follows:

language-specific factors >
oral fluency and proficiency >
frequency of input & use and individual factors

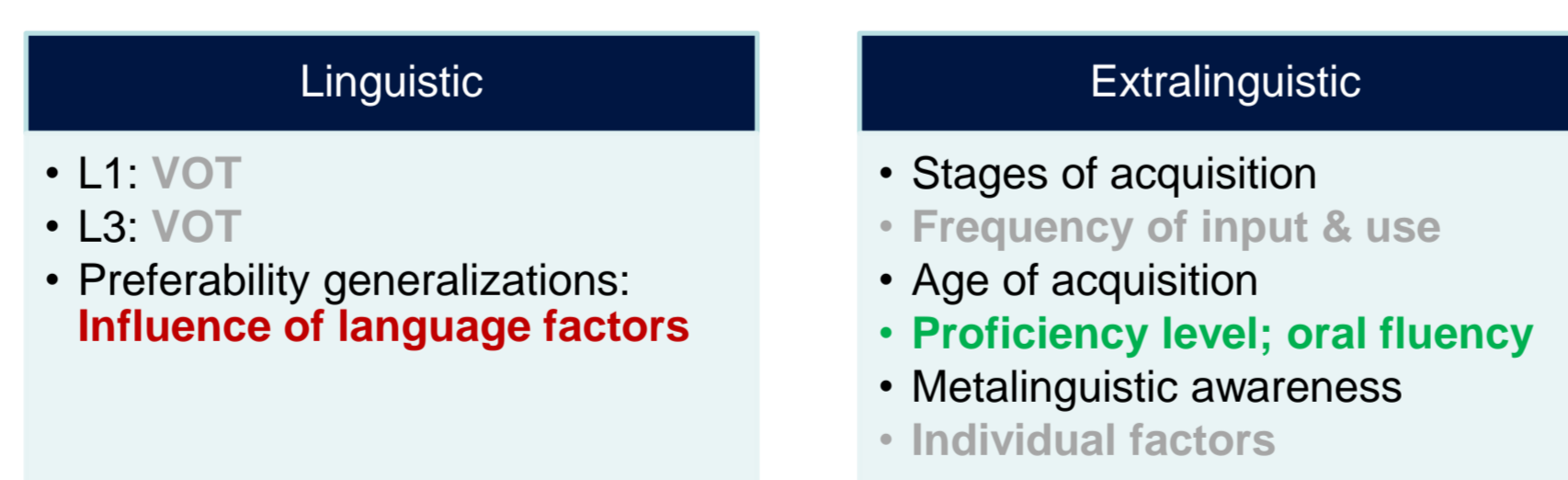


Figure 7. The linguistic and extralinguistic variables in NGTA.

Figures

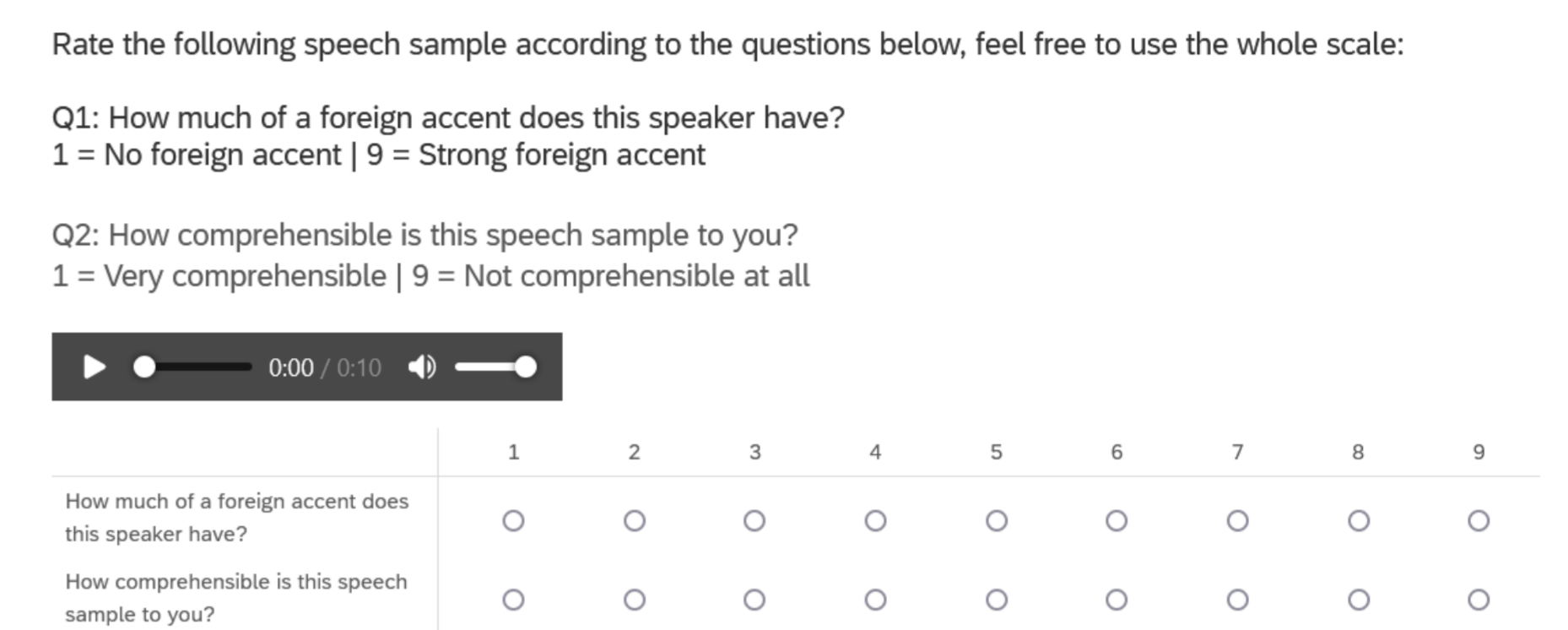


Figure 1. The rater's screen.

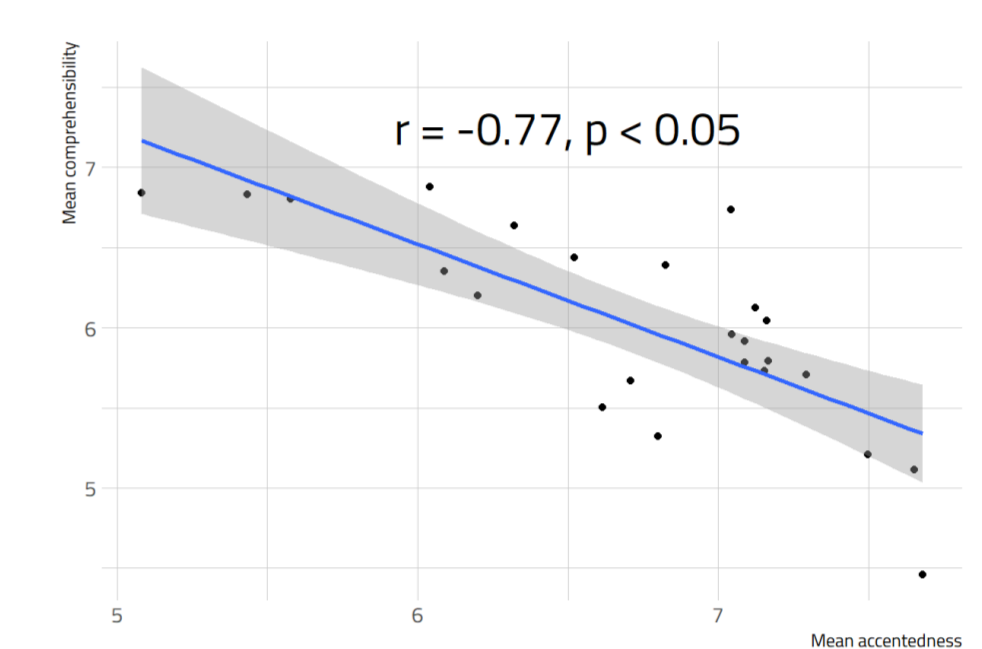


Figure 2. Accentedness vs. Comprehensibility.

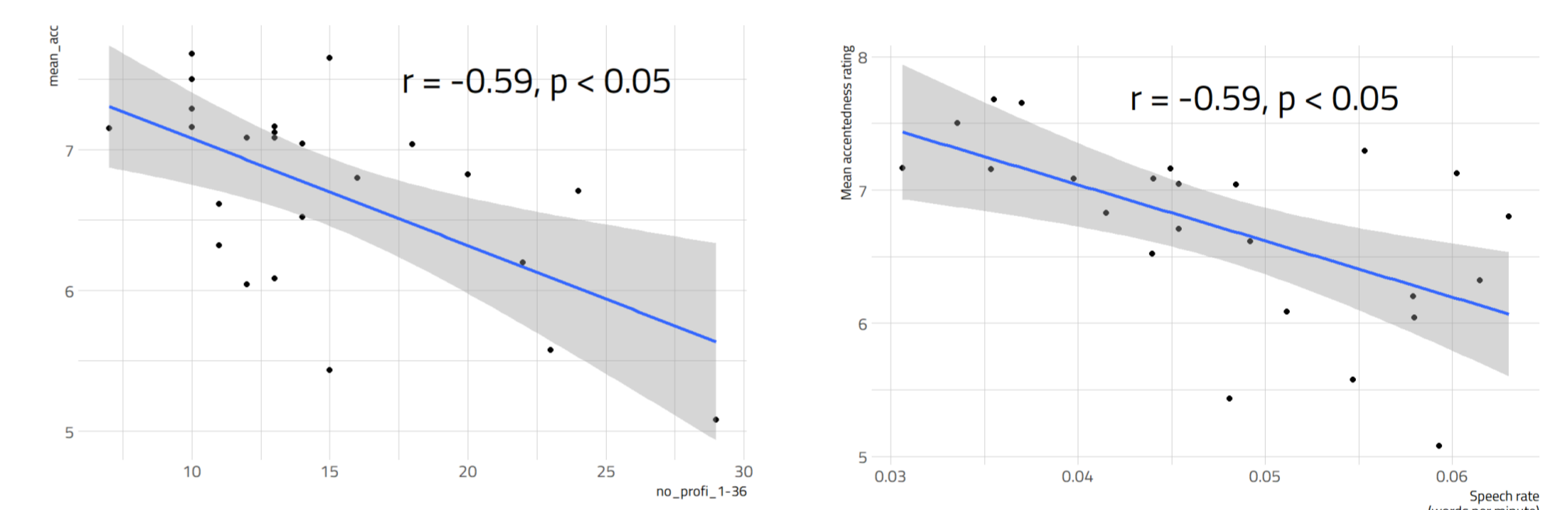


Figure 3. Left, Accentedness vs. L3 Proficiency. Right, Accentedness vs. Oral Fluency.

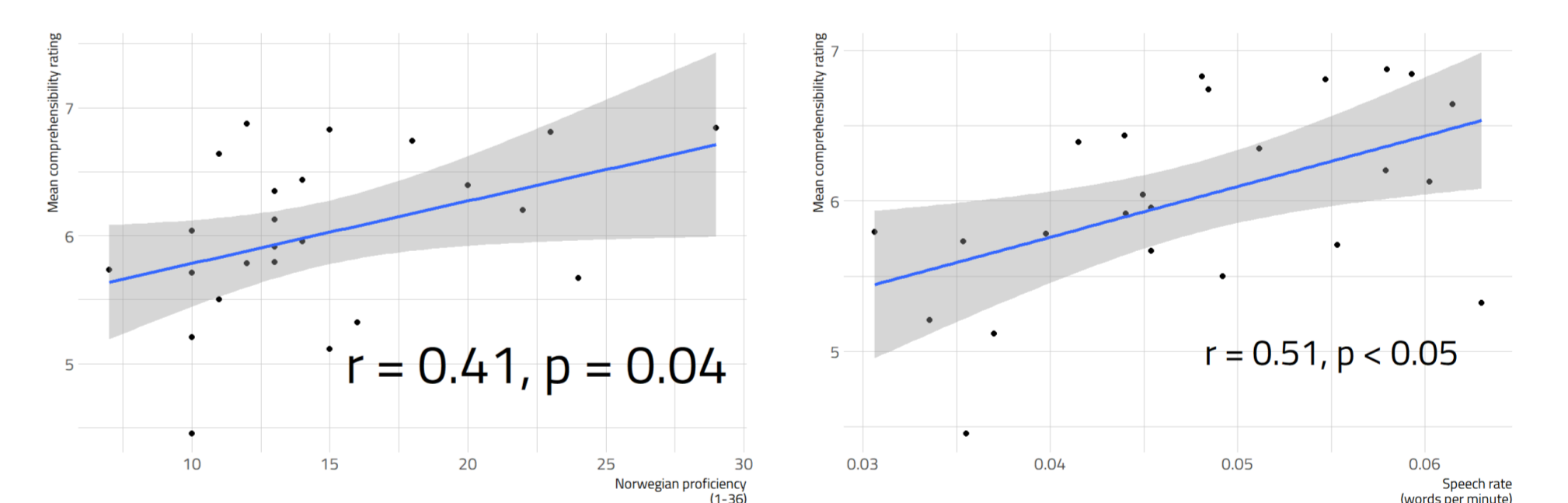


Figure 4. Left, Comprehensibility vs. L3 Proficiency. Right, Comprehensibility vs. Oral Fluency.

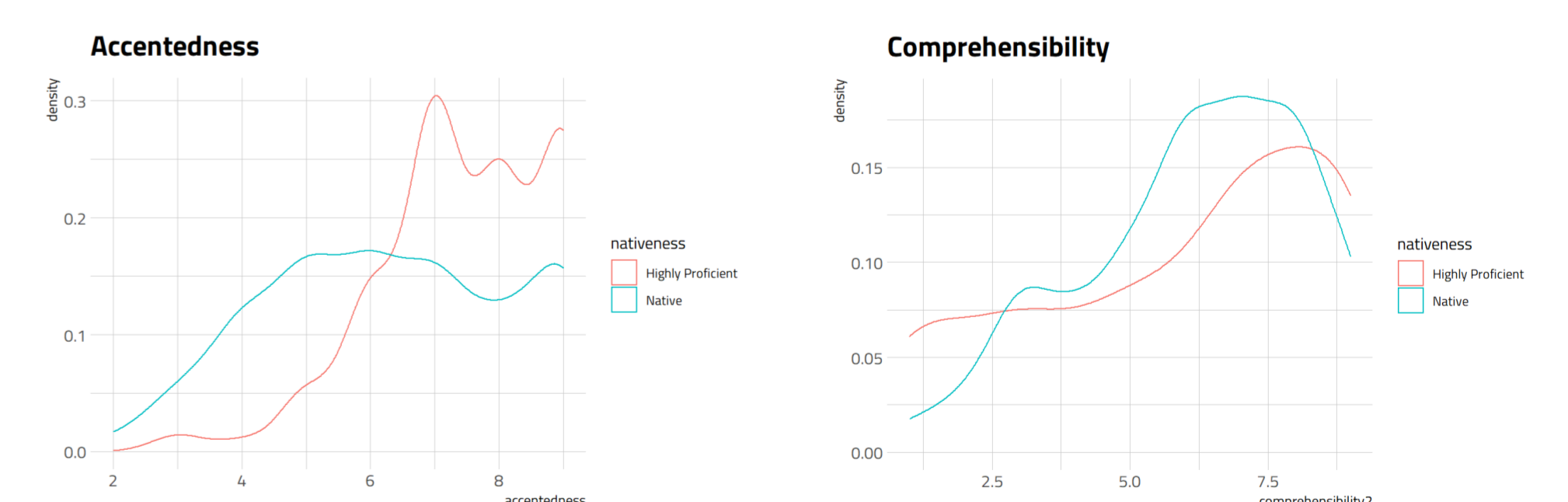


Figure 5. Ratings from Native vs. Highly Proficient raters.

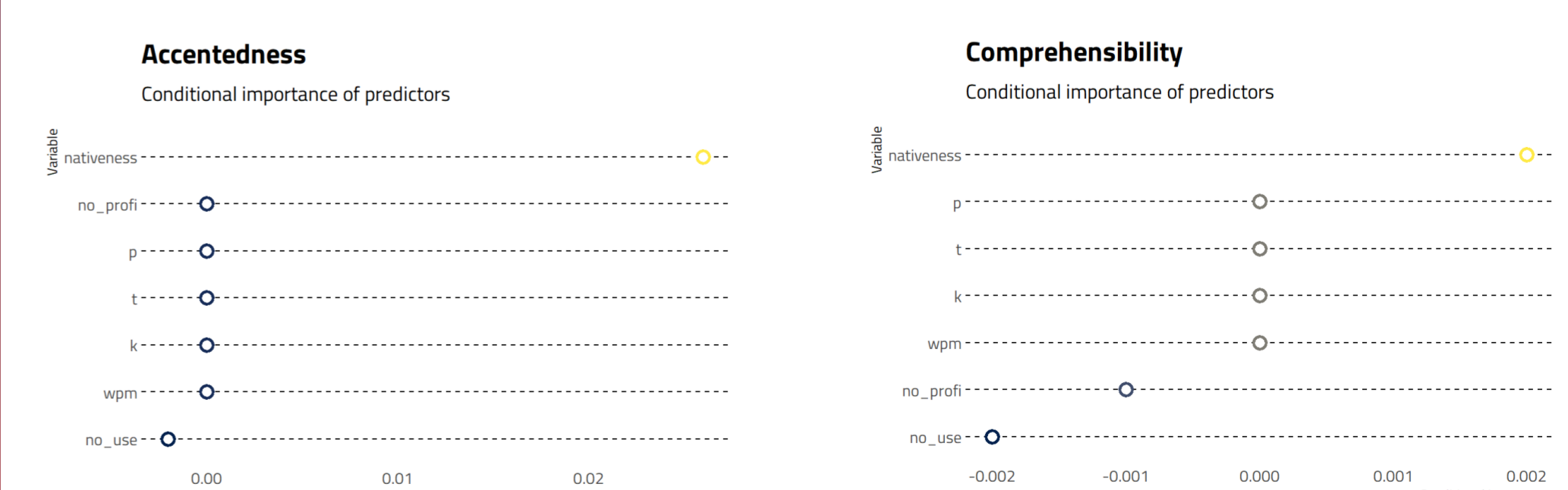
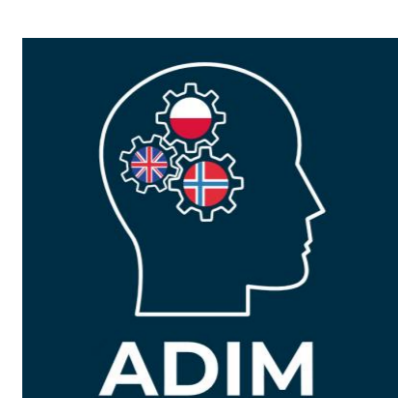


Figure 6. Random forest importance of predictors.

Acknowledgement

This research is supported by a grant of the Polish National Science Centre (NCN) OPUS-19-HS (UMO-2020/37/B/HS2/00617) **CLIMAD** "Cross-linguistic influence in multilingualism across domains: Phonology and syntax" as well as a Norway funds/NCN grant GRIEG-1 (UMO-2019/34/H/HS2/00495) **ADIM** "Across-domain investigations in multilingualism: Modeling L3 acquisition in diverse settings".



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