

Temporal characteristics of Estonian adolescent speech

Einar Meister^{1,2}, Stefan Werner¹, Lya Meister²

¹ University of Eastern Finland

² Tallinn University of Technology

Speakers differ in how fast or slow they read and produce spontaneous speech. Studies of adult speech have found that articulation rate in spontaneous speech is faster than that in read speech and the two rates are correlated - faster speakers have also a faster reading rate. In the case of younger adolescents the reading speed is found to be slower as they may not have yet reached the fluency level typical for adults [1].

In adolescents, both magnitude and variability of segmental durations decrease significantly between ages 9 and 12 reaching adult levels around age 12. It has been found that between ages 13 and 15 an overshoot in acoustic parameter values is evident, before converging to the canonical levels for adults. For instance, teenagers around age 14 differ from adults in that they produce shorter segmental durations and exhibit less within-subject variability in durations and other acoustic features. [2]

Our study reports some preliminary data on the temporal characteristics of Estonian adolescent speech focusing on age and gender related variability in read and spontaneous speech. The corpus [3] includes speech material from 175 girls and 134 boys in the age range from 9 to 18 years recorded while reading a text corpus containing linguistically diverse material: digits, phone numbers, time expressions, IT terms, sentences with name entities, phonetically rich sentences. The samples of spontaneous speech were elicited with pictures to be described and topics for storytelling. In total, 70 items (ca 15 minutes of speech) per speaker were recorded, resulting in ca 70 hours of speech in total. The recordings were carried out in ten schools around Estonia.

Durational characteristics (such as speaking rate, articulation rate, segment and syllable durations, etc.) are modeled using mixed effects analyses to capture age, gender and speech-style related variations as well as within-speaker and between-speaker variations.

References

1. Jacewicz, E., Fox, R.A., & Wei, L. (2010). Between-speaker and within-speaker variation in speech tempo of American English. *J. Acoust. Soc. Am.* 128 (2), 839-850.
2. Lee, S., Potamianos, A., and Narayanan, S. (1999). Acoustics of children's speech: Developmental changes of temporal and spectral parameters. *J. Acoust. Soc. Amer.*, vol. 105, pp. 1455–1468.
3. Meister, E. & Meister, L. (2017). Eesti laste kõne I. Põhitooni akustiline analüüs. *Keel ja Kirjandus*, 60 (7), 518–533.