

Perceptual and acoustic correlates of oral reading proficiency in German schoolchildren—a longitudinal study on fluency and intonation style

Christopher Sappok & Simon Wehrle

Institute of German Language and Literature II & I/FL-Phonetik, Universität zu Köln

Phonetic research on children's read speech is rare. In educational research the topic is more prominent, with such work usually being labelled as concerning "fluency". Such work has mostly been limited to parameters of automaticity (speed) and accuracy (errors) in terms of signal-based measurements. The investigation of so-called oral reading prosody is in almost all cases limited to global listener ratings. In view of this, we first juxtapose the established educational NAEP rating scale used for perceptual ratings of reading fluency with several advanced phonetic parameters, as applied to a longitudinal corpus of oral reading performances by German-speaking schoolchildren. A considerable amount of systematic variance in perception- and measure-based variables is revealed, showing the relevance of the variables chosen for quantifying the developmental stage of *oral reading proficiency*, and thereby establishing a more advanced notion of fluency.

On this basis, we aimed to move beyond conventionally used acoustic measurements by applying an innovative method for characterising intonation styles – along the dimensions of Wiggleness and Spaciousness, as used in our previous work to characterise autistic speakers – to the same longitudinal data set of children's oral reading performances. Our analysis reveals that higher listener ratings of oral reading proficiency are correlated with more dynamic intonation styles. Furthermore, we present evidence that both melodicity and listener ratings clearly tended to increase over time for individual speakers.

Moreover, we show that male children used a more melodic intonation style and received higher listener ratings than females, and that the type of text stimulus had a clear effect on intonational realisation. Our work is the first to provide robust empirical evidence for intonational correlates of oral reading proficiency, and simultaneously corroborates the validity of the method used for measuring intonation styles. In future research, we will attempt to align perception- and signal-based values even more closely, aiming to thereby potentially render costly rating procedures unnecessary. Our work further shows that more openness to interdisciplinary perspectives would definitely benefit educational research.