Submisson

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Title: Prominence rating procedures and assessment of reading skills – a perception experiment concerning dialogue read by fluent german children

Keywords: prosody, read speech, reported speech, break prominence, rating procedures, acoustic correlates, stylistic diversity, reading instruction

Abstract:

Prosodic reading has recently been claimed to be an aspect of reading fluency unjustifiably neglected by reading research (Kuhn, Meisinger & Schwanenflugel 2010). In this study, the capacity of a single reader to make a dialogue situation transparent by making turns salient prosodically is assumed to represent fundamental aspects of prosodic reading skills. An according perception experiment shows a high degree of stylistic diversity in 3rd grade. It is hypothesized that diversity tends to be neutralized in the subsequent course of conventional didactic treatment of oral reading in class.
The study involved n = 86 raters rating perceived prominence of breaks between utterances (see Sappok & Arnold 2012 for a syllable based experimental setup). The input consisted of audio samples of dialogue read by single children. The children represented the uppermost quartile in terms of reading fluency (NAEP 2005) out of a corpus of 48 3rd graders. They read a short children's story (Der Hase und der Schneemann - The Hare and the Snowman; 304 words). The stimulus text contained 12 turn of speaker situations. On the text sheet the individual turns were marked by icons instead of verbal direction. Each recording was broken down accordingly to 12 individual sound files (example content: Fig. 1) resulting in a corpus of 144 audio samples. Each rater was confronted with a set of 12 random samples from the corpus three times in a row on a PC equipped with headphones. The instruction was: Wie deutlich ist ein Sprecherwechsel zu hören? - How clear can a turn of the speaker be heard? Feedback was possible via mouse click on a four-level-scale ranging from:
"--" = sehr undeutlich - very unclear (= 1) to "++" = sehr deutlich - very clear (= 4). Additionally, the audio samples underwent phonetic analysis with respect to three very global acoustic correlates of stylistic means to represent turn of speaker on the utterance level (pausing as well as relations between left and right utterance):

- Pause duration [s] ("let time do the work")
- Pitch difference $F0_{diff} = |$ mean $F0_{left} -$ mean $F0_{right}|$ [Hz] (mimicking voices)
- Intensity difference $INT_{diff} = |$ mean $INT_{left} -$ mean $INT_{right}|$ [dB] (mimicking stereo effect and/or voices)

With respect to the hypothesis stated above, the following result is selected here:
For each child, a mean score was computed from ca. 260 individual ratings (squares in Fig. 2). Additionally, for each child average pause duration from 12 values was computed, as well as average $F0_{diff}$ and INT_{diff}. Multiple regression of $mean_{rating} \sim mean_{pause} + mean_{F0diff} + mean_{INTdiff}$ results in adj. $R^2 = .76$ (p = 0.002). The overview shows that children display different prosodic profiles to achieve high scoring (e. g. child 10 vs. child 12 in Fig. 2). This diversity is endangered by didactic concepts focussed primarily on adult target models (e. g. the teacher's reading, Lauer-Schmalz, Rosebrock & Gold 2014).
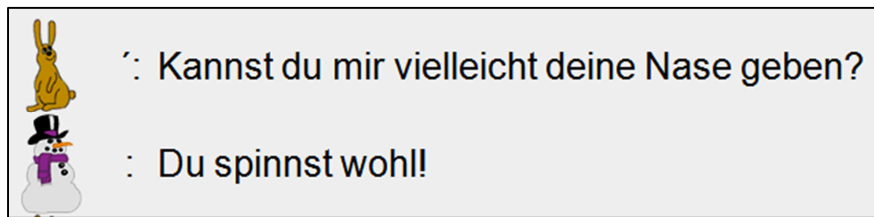
Figures:

Fig. 1.: The stimulus-equivalent of one of the 144 audio samples: Can you maybe give me you nose? -- You are nuts!
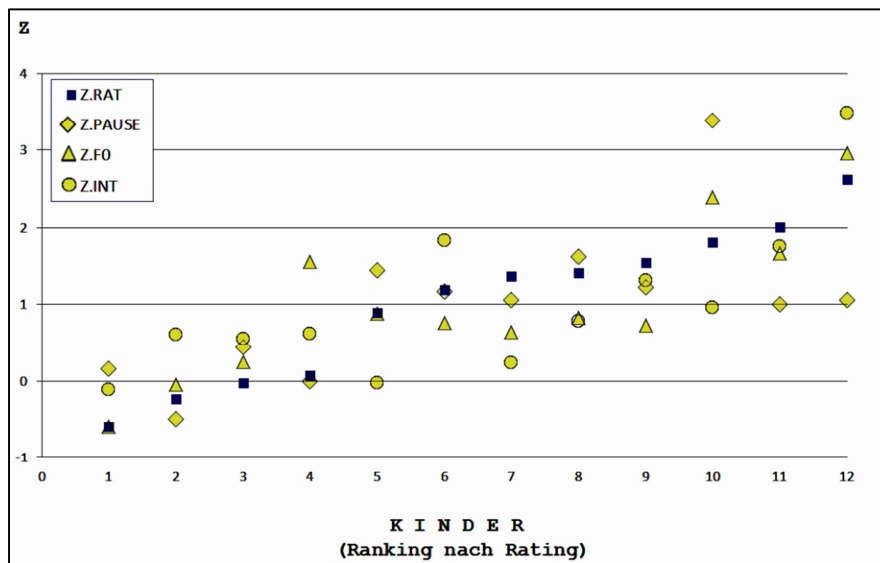

Fig. 2: Ranking of prosodic profiles for 12 3rd graders (best out of 48 in terms of fluency). Mean prominence/clarity of turn of speaker (squares) correlates highly with pause duration, F0-difference and intensity difference (adj. R^2 = .76, p = 0,002, all values z-normalized for presentation). Diverse constellations of acoustic values show that individual readers practice different styles in grade 3.

References:

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