

Automatic Objective Reading Fluency Measures of Child and Adult Speech

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Aim and research questions

The aim of the present study is to gain insights into the possibilities of obtaining reliable, valid and robust objective measures of reading fluency for automatic reading assessment. The research questions are 1) to what extent can we calculate reliable, valid and robust objective measures of read speech fluency?; and 2) how do such measures calculated for child read speech relate to corresponding measures computed for adult read speech?

Theoretical framework

Recent findings published in the PIRLS and PISA surveys offer an alarming picture of reading proficiency among Dutch youngsters, which has led to a call for innovative solutions that can boost reading instruction. One important aspect in reading education is how to keep track of reading development so that timely intervention becomes possible before it is too late. Current reading tests in school are laborious for teachers to administer. In addition, these tests only measure reading accuracy and automaticity, and not the third aspect of reading fluency, which is prosody (Kuhn et al., 2010). Automatic reading assessment through AI-based speech technology is the research avenue that is being explored in this study to overcome these limitations. It is important to include prosody measures in reading assessment, since these are important indicators of reading comprehension (e.g., Morrison & Wilcox, 2020).

Methodological design

Using AI-based speech technology, we compute automatic measures of reading fluency directly from read aloud speech recordings by Dutch adult and child speakers. We validate the automatic measures by comparing them with measures calculated from manual speech transcriptions and annotations. Subsequently, we analyze the relationship between these objective measures of reading fluency and multidimensional subjective measures of reading fluency for both adult and child speech.

Expected findings and conclusions

We expect to be able to compute automatically several objective measures related to different dimensions of subjective read speech fluency that are reliable, valid and robust. Since the children are still in the process of learning to read, we expect to find differences in scores on these measures between children and adults