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Analysis of acoustic cue production for atypical speech diagnosis

The Journal of the Acoustical Society of America **148**, 2470 (2020); <https://doi.org/10.1121/1.5146833>

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TOPICS

- Speech analysis
- Speech communication
- Diseases and conditions
- Machine learning
- Speech production
- Spectrograms

Meeting abstract. No PDF available.

ABSTRACT

Acoustic cues to lexical distinctive features can be found by examining speech waveform and spectrogram measurements, and can provide a more detailed analysis of speech than is currently provided by methods for identifying atypical speech production. Applying this individual-feature-cue framework to the clinical diagnosis domain, this project analyzes the acoustic cue patterns of young patients with various diagnoses, such as autism spectrum disorder, dyslexia, and Specific Language Impairment. It is hypothesized that each group will produce distinctive acoustic cue patterns for a widely used non-word repetition task, C-TOPP. The speech recordings of 37 subjects were labeled with their acoustic cues; these were then aligned with the cues expected in a canonical production, and acoustic cue level discrepancies were identified. With mispronunciation patterns of each atypical group identified, a Support Vector Machine (SVM) model was developed that can computationally help with diagnosing a patient, given his/her speech recording for this task. Although there are limitations to the study's diagnosis model due to the small data set, the preliminary results show promising insights, yielding 75.7% prediction accuracy for the diagnostic group.



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