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Clinically Interpretable Acoustic Meta-Features for Characterising the Effect of Mental Illness on Speech and Voice

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We analysed 17949 speech samples collected for three studies at the Affective Sciences and Psychopathology Laboratory, LSU: (1) a baseline sample of college students; (2) a sample of college students recruited to maximise variability in mental health conditions, to see whether the factor structure replicated with a larger corpus of speech from people with a range of mental health conditions, including comorbidities.

While preliminary results are encouraging, this study needs to be replicated with a larger corpus of speech from people with a range of mental health conditions, to see whether the factor structure persists. Even though GeMAPS was originally defined for automatic classification, we suggest that it should be used more widely for clinical studies.

Results

RQ1: Reliability of principal components
All five analyses yielded comparable solutions. While there is some overlap between components, the first component focuses on speaking rate, and the third on the key frequencies of the spectrum, F0 and the first three vocal tract resonances. The second and fourth component model variation in loudness and fundamental frequency, whereas the fifth covers spectral balance and variation in the spectrum.

RQ2: Modelling
Of the 103 people with mental illness, 20 had a history of only one mental illness (mostly depression, n=18), and the remaining 83 have a history of two or more.

People with a history of depression tend to have a flatter intonation contour, those with a history of psychosis a more variable one. As expected, vocal characteristics changed or were attenuated when including comorbidities.

Discussion

References and copy of the poster: https://wp.me/p7yWST-4l