Evidential value of long-term laryngeal voice quality acoustics

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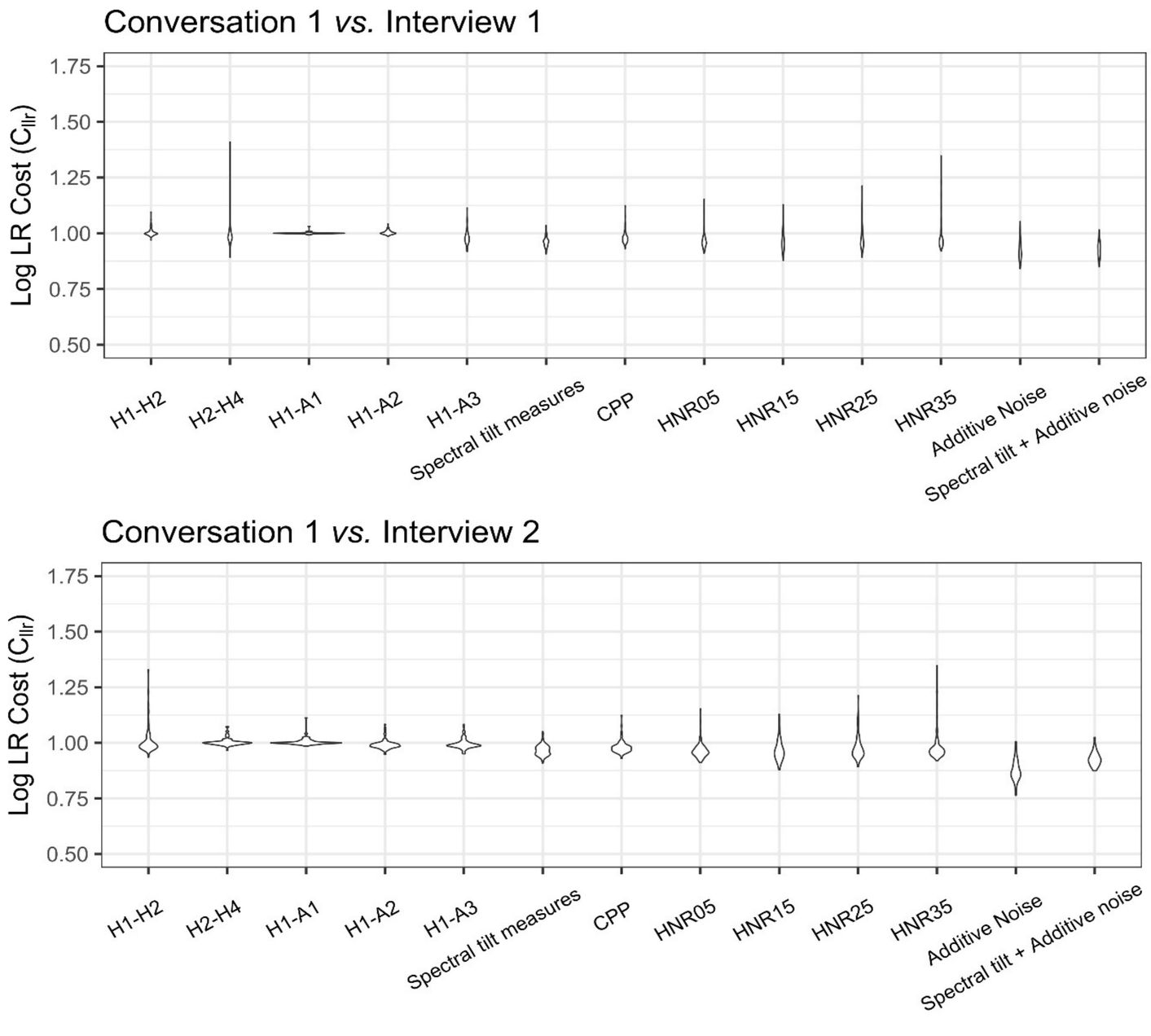
Results

- VQ parameters generally performed poorly
  - Mostly: C_{llr}~1 & EER > 40%
- Improved when combining the five spectral tilt or the five additive noise parameters
- BUT: using both spectral tilt & additive noise parameters → worse performance → conflicting information for distinguishing speakers?
- Non-contemporaneous recordings → higher C_{llr}
- Stable system performance (low *SD* in C_{llr} & EER values)



Background

- Purported usefulness of voice quality (VQ) analysis in FVC[1]
  - BUT: limited empirical validation
- Few FVC studies compared
1. match vs. mismatch in speech style
2. contemporaneous vs. non-contemporaneous recordings
- This study: laryngeal VQ + non-contemporaneous recordings; Bayesian likelihood ratio

Methods

- 75 male speakers aged 18-45
- Australian English
  - Sydney/New South Wales[3]
- Tasks: casual telephone conversation (CNV) & mock police interview (INT)
- Two recordings per speaker
  - ~ 2-week interval
- 33s of vocalic material per recording
- Spectral tilt and additive noise acoustic parameters
- MVKD + logistic regression
- 25 speakers: training, test, reference
- 100 replications[4]

Discussion

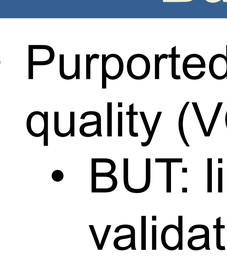
- Speech style mismatch + non-contemporaneous recordings: typical in FVC casework

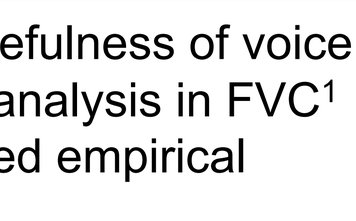
→ VQ parameters: limited evidential value
  - At best be combined with other features (e.g. MFCC)[2]

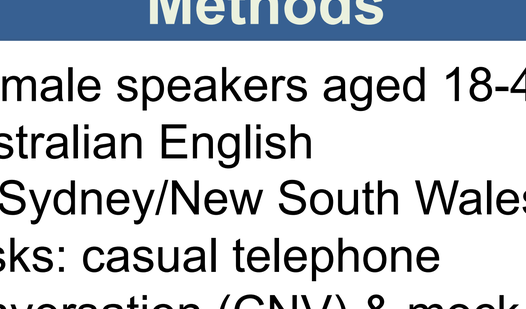
- VQ: not phonologically contrastive; no socially conditioned variation (males)

→Little room for between-speaker variation?

- Methodological issues:
  - MVKD—suitable?
  - Large age range
  - Not enough speech material for VQ analysis?







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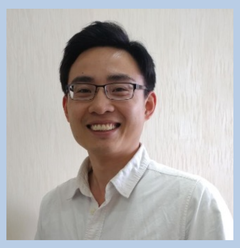

References

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