Aging effects on prosodic marking in German: An acoustic analysis

METHOD

Subjects
- 3 older (aged 65-80 years), 3 younger (aged 20-30 years) native speakers of German

Speech material
- 10 target words representing girl names (e.g. "Mila") with lexical stress on first syllable
- Question-answer paradigm to render target word in background vs. broad vs. contrastive (see below) condition

Acoustic measurements
- Vowel durations
- F1 & F2 measured at the vowels' midpoint
- Acoustic vowel space = calculating vowel articulation index (VAI) & vowel space area using /i, a, u/ [7,8]

RESULTS

Vowel durations
- Both age groups: duration of stressed vowel increases → longer in contrastive focus (accented) than in background (unaccented)
- Older subjects: longer vowel duration in respective conditions in all vowel types

Formant values
- Older subjects realize /a/ more centralized
- Older subjects show less variability than younger subjects in all vowel types

Acoustic vowel space
- Older subjects: VAI increases from background to broad, but decreases from broad to contrastive
- Reduced vowel space in older subjects (strongest effect in /a:/)
- Strongest aging effects on VAI in contrastive focus (older = 1.57 vs younger = 1.28)

DISCUSSION/CONCLUSION

- Proodic structure:
  - Temporal and spatial modifications of the stressed vowel in both age groups to increase prominence from background (unaccented) to contrastive focus (accented) [6,9]

- Aging effects:
  - Longer vowel durations but more centralized vowel qualities in older speakers → due to physiological constraints of vocal tract & slowed down movements [10,11]
  - Increase in duration could also be interpreted as a compensation strategy for the reduced vowel space to mark prominence

- Less variability of vowel formants in older speakers → indicates a less flexible vowel system for prosodic marking

REFERENCES