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### INTRODUCTION

- In forensic speaker comparisons, it is common to have delays between recordings of reference and suspect voices. The longer the delay, the more essential it is to consider the effect of aging on voice features, when assessing the mutual (dis)similarity between recordings.
- Most of the forensically oriented research on age-related changes in voice features has primarily focused on frequency domain characteristics (i.e. vowel formants). The aging process affects also the anatomy and movements of components of speech production mechanism. It is highly likely then that not only static measures but also rhythmic features linked to anatomy and movements of the articulators may vary with aging.

### RESEARCH QUESTIONS

- Is speech rhythm affected by the aging process?
- Is within-speaker rhythmic variability robust against the effect of physiological aging?
- Does aging affect all sets of rhythmic metrics to the same extent?

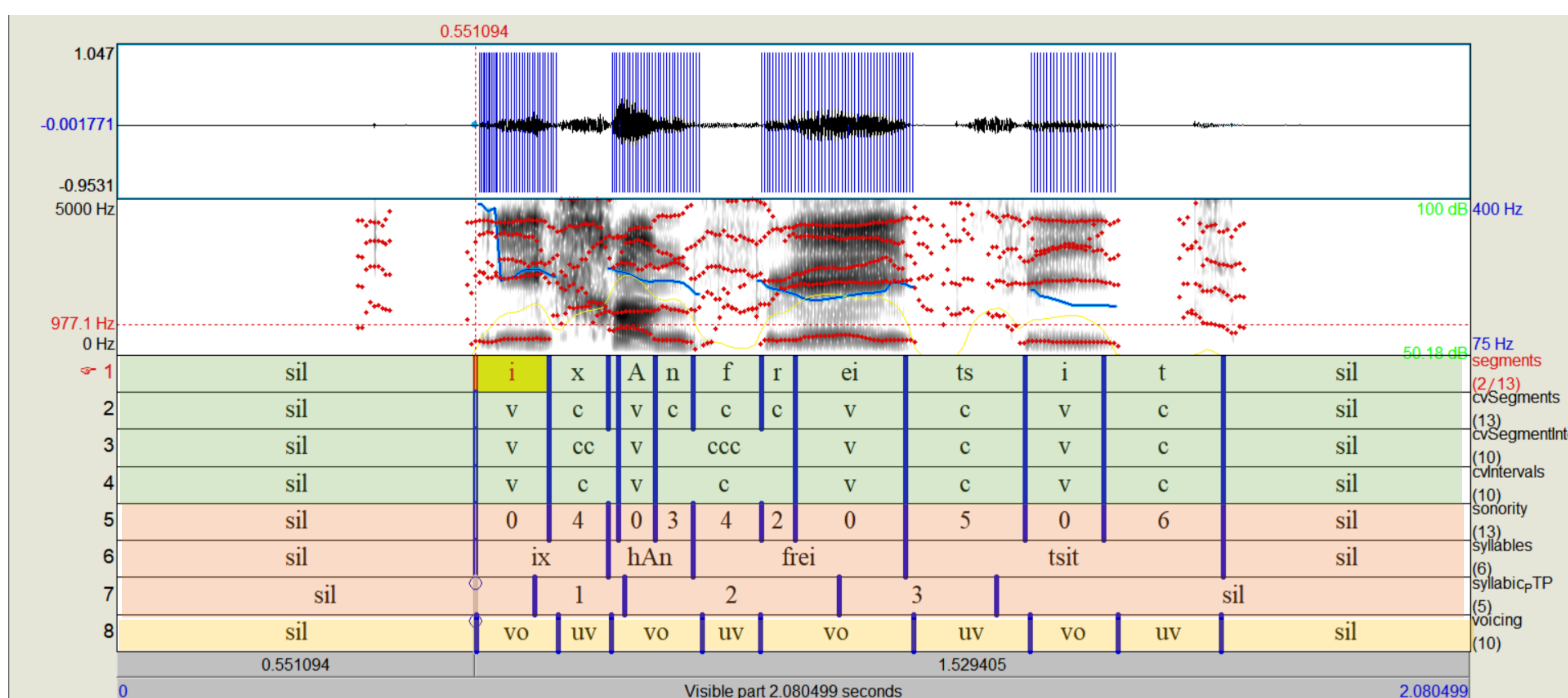
### HYPOTHESES

- H1:** Older adults produce rhythmic patterns that are clearly distinct from those of younger adults.
- H2:** Speech rhythm varies significantly within the speaker as a function of chronological age.
- H3:** Rhythmic metrics based on voicing pattern exhibit the greatest differences across age groups and within the speaker.

### SPEECH MATERIAL

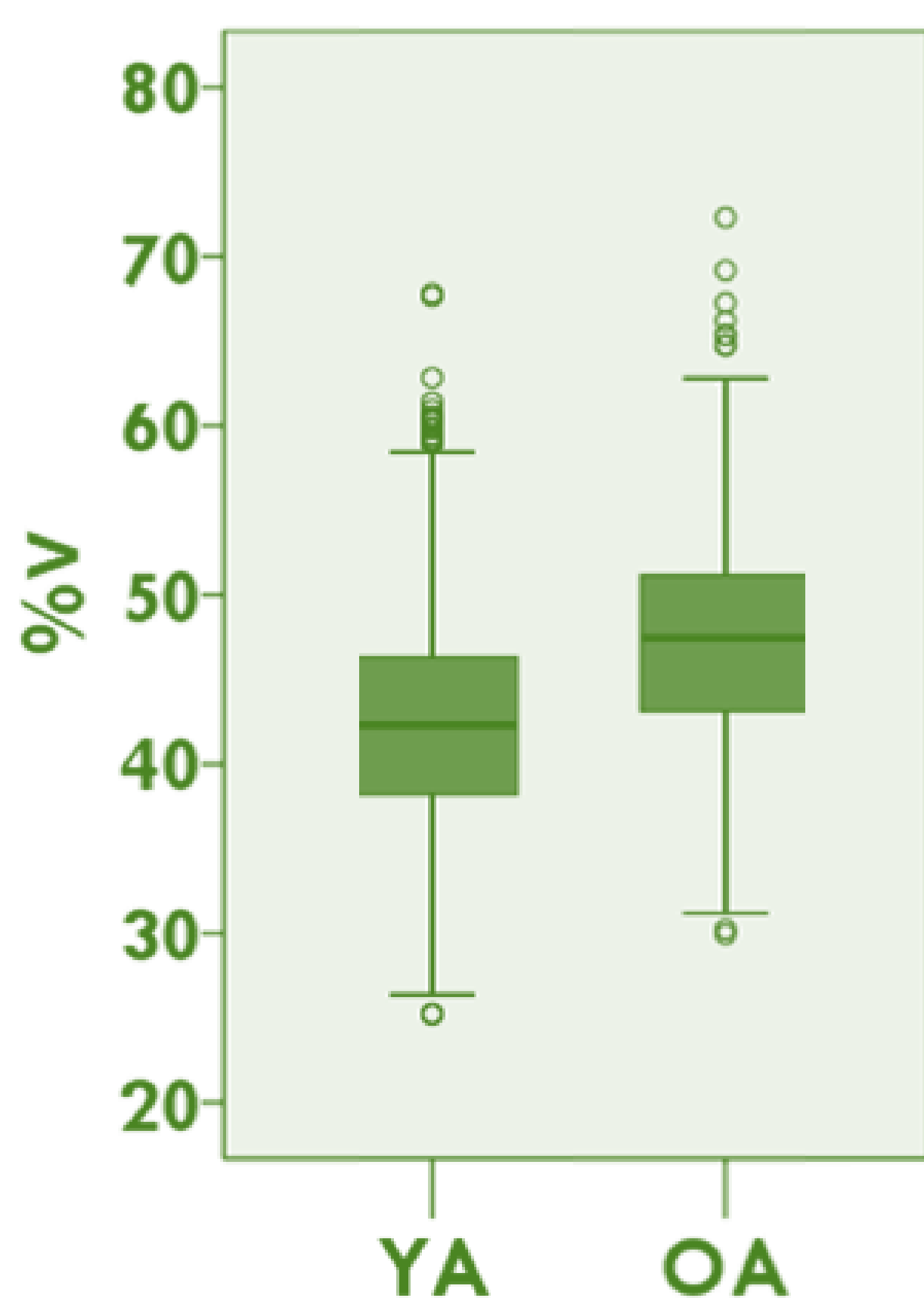
Language	Design	Subjects	Age	Speaking style	Speech Material	Rhythmic Analysis
Italian	Cross-sectional	4 younger adults 4 older adults	18-25 over 65	Read speech	4 utterances at 4 speech rates	- CV intervals durational variability
Italian	Longitudinal	1 speaker	40 79	TV news/ Acted speech	30 utterances	
Zurich German	Cross-sectional	16 young adults 10 older adults	18-30 over 65	Read speech	60 utterances	- CV intervals durational variability
American English	Longitudinal	3 speakers	35-80	Public lectures/ Radio/TV news	22 utterances	- Syllable intensity variability - Voicing intervals durational variability

### ANNOTATION FOR RHYTHMIC ANALYSIS



### RESULTS

#### ZURICH GERMAN



#### AMERICAN ENGLISH

