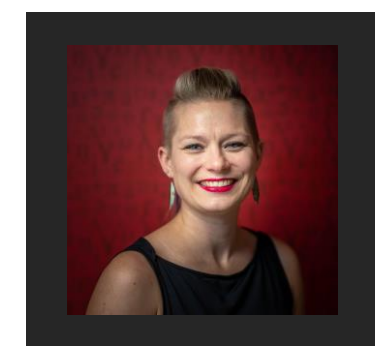


Vowel quantity in sung Estonian



PRESENTER:
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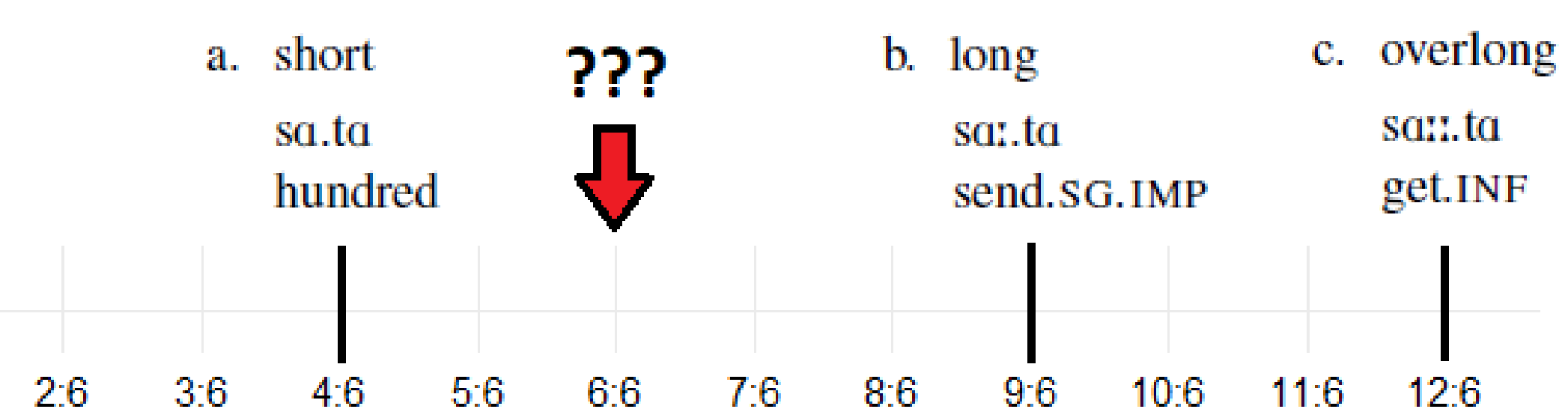
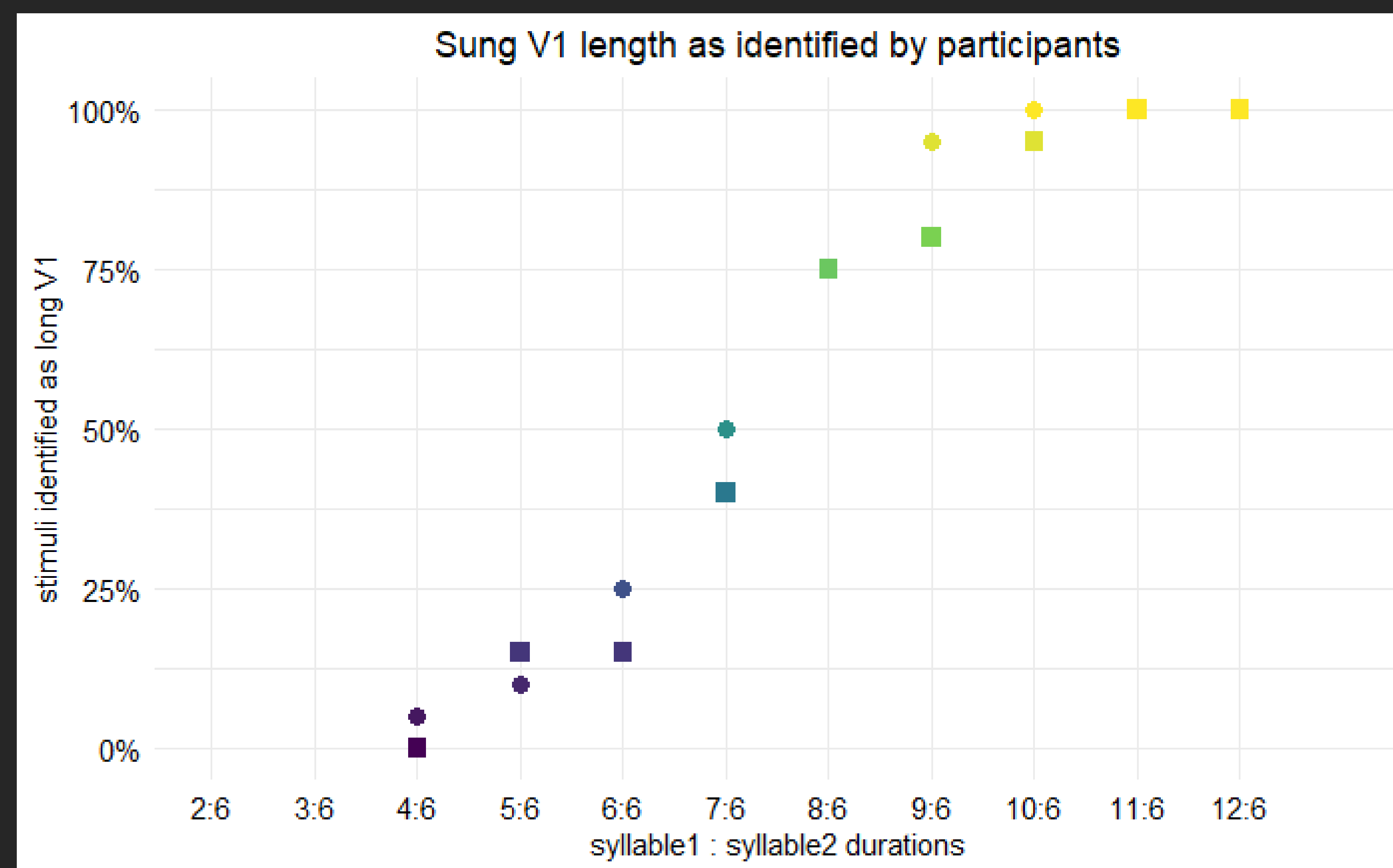
RESEARCH QUESTIONS

- To what degree are Estonian vowel length contrasts preserved in natively composed choral music?
- Are native listeners flexible enough to perceive vowel length contrasts in sung Estonian, where duration ratios are atypical as compared to spoken Estonian?

BACKGROUND

- Vowel length:**
 - The length of a speech sound can hold linguistic meaning.
 - For example, the Estonian words *sada* (“hundred”) and *saada* (singular imperative “send”) differ only in the length of the *a*.
 - Clear communication in Estonian could be impeded in singing, since the relative speed at which neighbouring syllables are sung could change the meaning.
- Syllable ratios in spoken Estonian:**
 - The phonological length of V1 (vowel in the first syllable of a word) is correlated perceptually with particular values for the ratios of first-syllable to second-syllable durations.
 - Short V1s correspond to a V1:V2 ratio of approximately 2:3, long to 3:2, and overlong to 2:1 (Lehiste, 1960).

Preliminary results suggest...
The clues that tell Estonian listeners whether they heard a **short** vowel or a **long** one are different in singing vs speech.



(Lehiste, 1960) (Lippus, Pajusalu, & Allik, 2009)

METHODS – Corpus Study

- Comprises natively-composed Estonian choral music in notated form.
- V1 lengths are compared to syllable1:syllable2 note length ratios as assigned by the composers.

METHODS – Perception Experiment

- Participants listen to sung phrases, each containing one nonsense word.
- Syllable duration ratios in nonsense words vary from 4:6 (“short” spoken V1) to 12:6 (“overlong” spoken V1).
- Participants identify whether they heard V1 as short or long.

Table 1: Sample data from perception experiment

nonce	carrier	ratio	participant	long_id
seke	tema	8:6	AT3	FALSE
toepe	tule	9:6	AT3	TRUE
toepe	tule	8:6	AT3	TRUE
moke	mine	12:6	AT3	TRUE
moke	mine	8:6	AT3	TRUE
to_ke	tule	12:6	AT3	TRUE
moete	vesi	8:6	AT3	TRUE
poeke	tahe	7:6	AT3	FALSE
mo_pe	tahe	6:6	AT3	FALSE
meke	esim	5:6	AT3	FALSE

PILOT STUDIES

- Initial results based on limited data.
- Corpus study:
 - 5 compositions
 - Total of 199 syllable pairs
- Perception experiment:
 - 2 participants
 - Each participant provided 180 judgments (9 different ratios for each of 20 different nonsense words).

Table 2: Comparison of Mean S1:S2 ratios

Data Source	S1:S2 ratio (short V1)	S1:S2 ratio (long V1)
Speech (Lehiste, 1960)	0.67	1.50
Perception Experiment	0.94	1.60
Corpus Study	1.03	1.11