PERCEIVED LEVEL OF LATE REVERBERATION IN SPEECH AND MUSIC

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OBJECTIVES
Subjective listening tests for studying the perceived level of reverberation.
- Effect of reverberation time (T₆₀), mixing ratio (d2r), and inter-aural coherence.
- Effect of source material.
- Intra-listener consistency and inter-listener differences.

TEST SETUP
Various types of anechoic or dryish source material:
- speech
- individual instruments
- music ranging from opera to heavy metal.

Impulse responses simulating diffuse late reverberation.

LISTENER TASK
“Rate the perceived level of reverberation on an absolute scale 0-100.” Two anchor signals provided for the scale.

RESULTS
- Reverberation tail shape has a prominent effect on the level perceived: equal mixing levels & T₆₀ increases -> rating increases.
- Mono and stereo reverberations with equal T₆₀ and d2r are perceived to have equal levels.
- Source material has a considerable effect on the level.
- Inter- and intra-listener differences are quite similar (RMSE 14 vs. 11).
- Inter-listener differences do not depend on the variety of the test stimuli (the difficulty of the test), nor clearly from the material.

THREE TESTS
1. Vary T₆₀ and d2r with different source material
   Repeat for intra-listener consistency check.
2. Mono vs. stereo reverberation on mono material.
3. Inter-listener differences with wide-ranging stimuli.

A subset of the results from Test 1 illustrating the effect of the source material on the level perceived.

FUTURE WORK
What causes the differences between material classes?
- Physical signal properties, e.g., onset density.
- Learned expectations, e.g., symphony music vs. speech.