PRESENTS

Phase Coherence as a Measure of Acoustic Quality

by David Griesinger

1 The Neural Mechanism

2 Perceiving Engagement

3 Hall Design

Presentation (3.6MB)

The three papers in this series focus on *engagement*, which results when sounds demand, and hold, our attention. Engagement is related to the perception of distance, and is distinct from intelligibility. Sounds perceived as close demand attention and convey drama. Sounds perceived as further away can be perfectly intelligible, but can be easily ignored. The properties of sound that lead to engagement also covey musical clarity – one is able, albeit with some practice, to hear all the notes in a piece, and not just the harmonies. Historically halls for both music and drama were designed to maximize engagement through their size, shape, and liberal use of fabric, tapestries, and ornamentation. Most classical music was composed to be heard in such venues. Modern drama theatres and cinemas still maximize engagement, as do the concert halls at the top of Beranek's ratings. But there is little recognition of engagement in acoustical science, and too few modern music venues provide it.

The first of these papers describes the physics and physiology that allow humans to perceive music and speech with extraordinary clarity, and how this ability is impaired by inappropriate acoustics. It also shows how engagement can be measured – both from an impulse response and from recordings of live music. Read paper 1

The second paper describes the psychology behind engagement, and makes a plea for concert halls and opera designs that maximize engagement and musical clarity over a wide range of seats. Read paper 2

The third paper presents some of the architectural means by which this can be achieved. The conclusions are often radical. For example, excess reflections in the time range of 10ms to 100ms reduce engagement, whether they are lateral or not. Read paper 3

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