

## The effect of playback method on listeners' judgments of concert hall auralizations

Samuel W. Clapp, Anne E. Guthrie, Jonas Braasch and Ning Xiang

Previous studies of the perception of concert hall acoustics have generally employed one of two methods for soliciting listeners' judgments. The first is to have listeners rate the sound of a hall while physically present in that hall. The second is to record the acoustics of a hall and later simulate those acoustics in a laboratory setting. While the first method offers a completely authentic presentation of the concert experience, the second allows for more direct comparisons between different spaces and affords the researcher greater control over experimental variables. Higher-order spherical microphone arrays offer a way to capture the spatial components of a concert hall's acoustics, which can then be reproduced using a loudspeaker array. In this study, eight different concert and recital halls were measured using both a spherical microphone array and binaural dummy head as receivers. Listeners were then presented with auralizations of the halls using an ambisonic loudspeaker array and headphones, and asked to rate the halls based on subjective preference and on similarity to one another. The responses were analyzed using multidimensional scaling methods in order to examine the effect of the auralization system on the listeners' judgments.