

Ways of representing sound

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Abstract

It is important to know which features of sound confer similarity and which confer difference. This paper suggests that this depends on the circumstances in which sounds are heard, and the way in which this interacts with the type of sound heard. Similarity judgements were taken across three sets of sounds, one where the sounds were acoustically similar but from different sources, one where the source was the same but the sounds were different and one where the sounds were unfamiliar. Results showed that the same source sounds tended to be grouped by existing categories such as animal sounds, the unfamiliar on the basis of their acoustic properties and the same sound/different source by a mixture of acoustic and category-based descriptors. This knowledge has implications for the design and implementation of auditory warning sounds and other sounds used in human factors and ergonomics applications. The similar sound group will be reported here.

Methodology

15 participants took part in the study (for the similar sound group) and all the participants had normal or corrected-to-normal hearing as measured by self report. The sound stimuli were presented using a purpose written grouping program (Aldrich, Oct, 2003).

The similar sound set was made up from 20 sounds (not all abstract) made up of ten pairs of sounds that sound similar but come from different sources e.g. food frying and rain falling. Two other groups were employed but not discussed in detail here.

The program presented participants with 20 icons representing the 20 sounds from the similar sound set. The task required participants to sort the icons so that they represented groups of sounds that the participants felt were similar. In addition participants were asked to provide a one sentence explanation for each of their sound groups after the grouping task was complete.

Results

Multidimensional scaling analysis using a composite matrix from all 15 participants identified 3-dimensional solutions as the most appropriate for the similar sound set. The R^2 value suggested that 96% of the variance was accounted for with a stress