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Am I tone-deaf? Assessing pitch discrimination in 700,000 people

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Abstract

Congenital amusia of pitch (tone-deafness), which affects 1.5% of the population, involves a deficit in pitch processing affecting the perception of musical melody and some speech contrasts. Lay-knowledge of tone-deafness considers the phenomenon to be categorical, as does prior work contrasting ‘amusics’ to ‘controls’, designated as such by thresholds on diagnostic tests. Is amusia a qualitative break from normal pitch discrimination, or does it represent the extreme end of a distributed skill? Large-scale datasets, combined with theoretically motivated tools for extracting latent measures of ability, can answer this question. We studied individual differences in pitch discrimination in 700,000 people using Bayesian hierarchical diffusion models. We found no evidence for a categorical deficit: pitch perception ability was normally and continuously distributed. We additionally report preliminary findings on pitch perception ability as a function of age, gender, native language, musical experience, and self-assessments of tone-deafness.