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Title:

No otoacoustic evidence for a peripheral basis underlying absolute pitch

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Abstract:

Absolute pitch (AP) is the ability to identify or produce the perceived pitch of a sound (e.g., fundamental frequency of a piano note) without an external reference. This ability is relatively rare (~1/10000 individuals possess it) and the mechanisms underlying AP are not well understood. This study examined whether there was evidence for a peripheral (i.e., cochlear) basis for AP based upon otoacoustic emissions (OAEs). The chief motivations were that both AP and spontaneous emissions (SOAEs) appear to have genetic components and anecdotal observations of prevalence in certain populations (e.g., relatively higher incidence of both in Asians). We examined SOAEs and stimulus-frequency emissions (SFOAEs) in both control (N=21) and AP (N=13) normal-hearing populations. We found no substantial differences in SOAE activity between groups (e.g., no evidence for one or more strong SOAEs that could act as a cue). SFOAE phase-gradient delays, measured using several probe levels (20-50 dB SPL), also showed no significant differences. This latter observation argues against sharper frequency selectivity in AP subjects. Taken together, these data support the prevailing view that AP mechanisms arise at a processing level in the central nervous system at the brainstem or higher (e.g., optimized neural coding).