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Pitch discrimination: Combination of information across frequency

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Performance (d') for fundamental frequency (F0) discrimination was measured for two complex tones (A and B) presented either individually or simultaneously. The objective was to investigate how information is combined in pitch processing. For most subjects, tones A and B were filtered from 1350-1650 and 3300-4200 Hz, respectively, such that both contained only unresolved components (components were added in sine phase). The tones had identical nominal F0s of 75 Hz, and the difference in F0 between the two intervals of a 2AFC trial was the same for A and B. When A and B were tested individually, performance was equal for the two tones (d' value ~ 1). For some subjects, to achieve equal d' for the two tones, all components were added in alternating phase, F0 was increased to 90 Hz, and tones A and B were filtered from 1375-1875 and 3900-5400 Hz, respectively. Presenting the tones simultaneously should increase d' by a factor of 1.41, if information from both were combined optimally. The results showed no increase in d' above that measured for the individual tones for three subjects, and only a very small improvement for another three subjects (factor of about 1.1) [supported by EPSRC Grant EP/D501571/1].