

ACOUSTICS2008/1743
**Pitch discrimination of simultaneous and nonsimultaneous
complexes across spectral regions**

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Detecting differences in fundamental frequency (F0) across different spectral regions may be important in the perceptual organization of both simultaneous and sequential sounds, but it is unknown whether the same mechanisms are involved in these two cases. Here we directly compare the detection of pitch differences between pairs of complex tones presented either simultaneously or sequentially. Twenty-eight normal-hearing listeners heard two pairs of complex tones in each trial and indicated the pair in which the pitches of the two tones differed. The complex tones in each pair were bandpass filtered to have non-overlapping spectra, but at least some resolved harmonics in all cases. Performance was generally better in the simultaneous than in the sequential condition. In a follow-up condition, it was found that introducing an onset asynchrony between the two spectral regions in the simultaneous condition resulted in impaired performance, approaching that found in the sequential case, despite the duration of the simultaneous portion remaining the same. The results suggest that perceived fusion, rather than an explicit F0 extraction and comparison may underlie the detection of F0 differences between simultaneous groups of harmonics in distinct spectral regions. [Work supported by NIH grant R01 DC 05216.]