Demonstration 12. Dependence of Pitch on Intensity (0:48)

Early experimenters reported substantial pitch dependence on intensity. Stevens (1935), for example, reported apparent frequency changes as large as 12% as the sound level of sinusoidal tones increased from 40 to 90 dB. It now appears that the effect is small and varies considerably from subject to subject. Whereas Terhardt (1974) found pitch changes for some individuals as large as those reported by Stevens, averaging over a group of observers made them insignificant.

Using tones of long duration, Stevens (1935) found that tones below 1000 Hz decrease in apparent pitch with increasing intensity, whereas tones above 2000 Hz increase their pitch with increasing intensity. Using 40-ms bursts, however, Rossing and Houtsma (1986) found a monotonic decrease in pitch with intensity over the frequency range 200–3200 Hz, as did Doughty and Garner (1948) using 12-ms bursts.

In the demonstration, we use 500-ms tone bursts having frequencies of 200, 500, 1000, 3000, and 4000 Hz. Six pairs of tones are presented at each frequency, with the second tone having a level that is 30 dB higher than the first one (which is 5 dB above the 200-Hz calibration tone). For most pairs, a slight pitch change will be audible.

Commentary

> "First, a 200-Hz calibration tone. Adjust the level so that it is just audible".
> "Now, 6 tone pairs are presented at various frequencies. Compare the pitches for each tone pair."

References

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