Acoustic Measurements of Tonality Words at the Eardrum
Presentation abstract for International Symposium of the Verbotonal Method
Zagreb, Croatia, May 2011

Authors
Tony Cooper
Bob McLean
John S. Berry

Abstract
For nearly two centuries, speech and hearing scientists have studied pitch rankings among different speech sounds. Generally, listener ranked speech sounds in order from low to high pitch. Pitch ranking for speech sounds has been extended to include monosyllabic words. In one study by Bessel (1978), listeners ranked 30 monosyllabic words from low to high pitch. Bessel (1978) established three discrete categories of pitch, low, middle, and high. Subsequently, Bessel and Asp (1980) performed an acoustical analysis of those same 30 words using a sound spectrograph and frequency analyzer for measurements of fundamental frequency, formants, duration, and amplitude spectra. Bessel and Asp (1980) reported significant correlations between the rank order of the monosyllabic words and amplitude spectra and between the monosyllabic words and the second formant. The purpose of this study was to extend the work of Bessel and Asp (1980). A new recording of the same words used by Bessel (1978) was created in an acoustically treated chamber. Those same words were then broadcast and recorded at listeners' eardrums for acoustic analysis. A regression analysis was performed between the energy in frequency bands of the words and their perceptual ranking. Correlations greater than 90% indicate that certain acoustical properties predict perceptual ranking and pitch category.