

ACOUSTICS2008/1598 Perception of sinewave vowels

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There is a significant body of research examining the intelligibility of sinusoidal replicas of naturally spoken utterances. Discussion has followed about what the sinewave speech phenomenon might imply about the auditory and perceptual mechanisms that are involved in phonetic recognition. However, this work has typically been conducted using meaningful and syntactically well formed sentences, making it unclear what the relative contributions are of higher level, top-down processes as opposed to lower level auditory and phonetic mechanisms. The simple purpose of this study was to measure vowel intelligibility using sinusoidal replicas of naturally spoken /hVd/ syllables. The sinusoidal signals were modeled after 300 utterances selected from a database of 1,668 syllables spoken by men, women, and children [Hillenbrand, Getty, Clark, and Wheeler, *J. Acoust. Soc. Am.*, 97, 3099-3111 (1995)]. Listeners consisted of 74 students enrolled in an introductory phonetics course. Recognition rates for the sinusoidal vowels averaged 55%, with considerable variability across listeners. This figure is substantially lower than the ~95% intelligibility (measured in several earlier studies) of the naturally spoken signals upon which the sinusoidal replicas were modeled. Attempts to improve performance using three different training methods met with modest success, with post-training recognition rates rising by ~5-12 percentage points, depending on the training method.