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**Factors affecting recognition of vocoded speech: Effect of envelope cutoff frequency and carrier type**

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Multiband vocoded signals are used to study temporal cues as well as to simulate information available to cochlear implant wearers, but different implementations of these signals may affect results. This series of experiments varied envelope cutoff frequency (30 or 300 Hz), carrier type (tone or noise) and number of frequency bands (2-5) for vocoded speech presented to normal-hearing subjects. Dependent measures were consonant recognition (vowel-consonant-vowel syllables), vowel recognition (/b/-vowel-/d/ words), and sentence recognition. Results indicated better performance with a high envelope cutoff for tone-vocoded signals, and no effect of envelope cutoff for noise-vocoded signals. When only low-frequency envelope cues were available, performance was better for noise-vocoded than for tone-vocoded signals. When higher-frequency envelope cues were available, performance was better for tone-vocoded than for noise-vocoded signals. To understand the source of the observed differences, a follow-up study tested the relative contributions of comodulation across bands (as in the 30- and 300-Hz tone-vocoded conditions) and spectral sidebands (as in the 300-Hz tone-vocoded conditions). Those data indicated that comodulation across bands did not contribute to performance. The presence of sidebands which provided more spectral detail improved performance over a sparser spectrum. [Supported by the Bloedel Hearing Research Center and NIH RO1 DC006014]