

## **Vowel and consonant perception by pre-lingual subjects using a multiple electrode cochlear implant.**

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Two speech perception experiments were conducted on three pre-lingually deaf subjects (deafened before 16 months of age), two adults and one adolescent, within the first year of use of multiple electrode cochlear implant. First was vowel identification in the electrical stimulation alone (E), vision alone (V), and electrical stimulation plus vision (EV) conditions. Second was consonant identification in the E, V, and EV conditions. To reveal the underlying structures of the perceptual confusions, data for the first experiment were analyzed using multidimensional scaling, and data for the second using hierarchical clustering and information transmission analysis. The one-dimension solution for vowels in the E condition was interpreted as vowel length. Visual vowel parameters interpreted the one-dimension solution for the V condition and two-dimension solution for the EV condition. The E condition consonant results indicated a high degree of perceptual confusion. The minimal differences between the consonant results for the V and EV conditions suggested minor influences of the electrical signal in EV perception. The results were in agreement with the psychophysical data obtained from the subject. These findings suggested that the subjects were unable to effectively use all the information provided by the multiple electrode cochlear implant during the first year.



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