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SPEECH CUES FOR COCHLEAR IMPLANTEES: SPECTRAL DISCRIMINATION

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The ability of cochlear implantees to understand speech varies ... wide range. While some implantees achieve scores close to 100... open set word tests, others require visual cues to achieve a signif...

score on these tests. The focus of this research is to investigate reasons for the wide range of ability and therefore to improve the speech processors used by individual implantees. This study first investigated whether the relative importance of various frequency regions of the speech spectrum differs for implantees of different performance levels, and for implantee groups compared to normally hearing subjects. Secondly, correlations were sought between speech perception information and ability to perceive changes in stimulation place within various spectral regions. Fifteen subjects using the Mini System 22 implant and with a range of speech perception skills, and 15 normally hearing listeners participated in this experiment. Articulation Index (AI) procedures were used to measure the proportion of speech information in monosyllabic words available to each listener, and the relative contribution to the total information from different frequency bands. Results show that implantees obtain less speech information, compared to normally hearing listeners, in all spectral regions. However, implantees perceive relatively more information in the higher frequency regions compared to the other frequency regions. Further studies sought a relationship between the amount of speech information perceivable and ability to discriminate between electrodes. Results show that these two factors are correlated in the lower frequency regions, but not in the higher frequency regions. Discrimination between electrodes in the highest frequency band was generally poor, even though the amount of speech information perceived in this region was greater than the low to mid frequency regions. This indicates that while perception of low to mid frequency information requires the ability to discriminate between electrodes, the perception of high frequency information does not require this ability. The results therefore predict that speech perception may be improved by changing the assignment of frequencies to electrode positions to provide more discrimination of low to mid frequency speech information.

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