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Intelligibility of interrupted speech in normal-hearing listeners and cochlear implantees

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The intelligibility of a target speech signal is substantially degraded in the presence of a competing talker in cochlear implantees. The current study aimed to test whether this degradation is caused by an inability to i) make use of the partial target speech information glimpsed into the competing talker "valleys", and ii) fuse perceptually those successive glimpses into coherent speech streams. This hypothesis was tested by assessing the intelligibility of periodically interrupted vowel-consonant-vowel (VCV) signals pronounced by a male (F0=113 Hz) and female (F0=216 Hz) speaker in normal-hearing listeners and implantees. A 4-Hz square-wave modulator with random phase was used to interrupt periodically each signal. The interrupted VCVs from each speaker were either presented alone (Experiment 1) or interleaved (Experiment 2: the two speakers were alternated). In experiment 1, the mean identification score calculated for each voice was about 90% in normal-hearing listeners, and 40% in implantees. In experiment 2, the mean identification score corresponding to correct identification of both voices was about 50% in normal-hearing listeners, but at chance level in implantees. Taken together, these data suggest that implantees can make use of partial speech information, but cannot organize this partial speech information into coherent streams.