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**Effect of channel interactions on sensitivity to binaural timing cues
in electrical hearing**

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With bilateral cochlear implant (BCI) users it is possible to test sensitivity to interaural timing differences (ITDs) while bypassing peripheral auditory processing. Ongoing work in our lab suggests that at low pulse rates ITD JNDs in the tens of microseconds can be achieved by BCI users with postlingual onset of deafness at single pairs of electrodes at the base, middle or apex of the electrode array. The current project is concerned with channel interactions and, specifically, performance when there is activation of more than one electrode pair and when more than one ITD is presented to the auditory system simultaneously.

We examined ITD sensitivity in BCI users with bilateral pairs of pitch-matched electrodes on which unmodulated pulse trains were presented at 100 pulses per second. A probe pulse train and an added pulse train were temporally interleaved. ITD JNDs for the probe train were measured while varying the added train's: a) frequency place, b) level, and c) ITD (matched to probe or fixed at 0 μ s). Results suggest that stimulation of multiple electrodes can result in a range of interaction effects that can have either facilitatory or interfering effects on binaural sensitivity.

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