ABSTRACT
Bilateral cochlear implant (BCI) users typically exhibit poor sensitivity to interaural time differences (ITDs) when listening for one stimulus at a time. However, a recent study suggests that ITD JNDS in the left of monaural can be achieved by BCI users with properly programmed stimulation that simulates a single pair of electrodes. Specifically, we are examining whether sensitivity to ITDs presented on one channel is better than that due to the other channel. ITD JNDS are measured for bilateral cochlear implant users at different frequencies using a frequency doubling technique. In our experiments, we present stimuli to BCI users who are bilaterally deaf, which means that both ears hear the same external sound and both ears hear the internal sound. We assess whether the bilateral auditory system can be used to enhance sensitivity to ITD. In the current study, we conducted experiments to examine whether the bilateral auditory system can be used to enhance sensitivity to ITD.

INTRODUCTION
There are now thousands of bilateral cochlear implant (BCI) users worldwide, and this number could potentially increase because of binaural cues, which are important for localization and understanding speech in noise. Previous work in our lab suggests that BCI users exhibit relatively good sensitivity to interaural time differences (ITDs) at frequencies between 2000 and 9000 Hz. It has been suggested that the BCI auditory system is different from the contralateral auditory system for certain stimuli, such as dichotic electric stimuli presented to one of the ears. This may have significant implications for binaural sensitivity-based measures of cochlear function.

METHODS
For adult listeners (ages 20 to 35) with normal hearing as verified by audiologists at hearing centers, we used the frequency doubling technique with sound stimuli from 250 to 6000 Hz. Stimuli were presented bilaterally through BCI electrodes. Specifically, we are examining whether sensitivity to ITDs presented on one channel is better than that due to the other channel. ITD JNDS are measured for bilateral cochlear implant users at different frequencies using a frequency doubling technique. In our experiments, we present stimuli to BCI users who are bilaterally deaf, which means that both ears hear the same external sound and both ears hear the internal sound. We assess whether the bilateral auditory system can be used to enhance sensitivity to ITD.

RESULTS
The results indicate that sensitivity to ITD JNDS is significantly better in the left ear than in the right ear. This finding suggests that the bilateral auditory system can be used to enhance sensitivity to ITD.

CONCLUSIONS
Presenting multiple click trains may not necessarily result in reduced ITD sensitivity.

REFERENCES
We thank Nicholas Limonta for help with data collection and analysis. This research is supported by NIH-NIDCD Grant No. R01 DC03660-03 (Liotti) and JFD DC036601-01 (Anees).