



Enhanced music performing environment for persons with cochlear implants (CI)

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A cochlear implant (CI) user is able to participate in music sessions and even professional music making. Contemporary CIs have improved speech perception abilities, but they are still challenged with music perception (McDermott, 2004). In a CI, the frequency range and spectral resolution of normal hearing is substituted with 14-24 channels (Ojala, 2012; Patel, 2013).

During music-making, the limitations in auditory feedback require some extra effort from the performer, e.g. position in the room to get a satisfactory soundscape (Palmer, Lahtinen, Ojala, 2012). When performing with a microphone and a PA system, the monitor loudspeaker is an important asset.

The primary scope of this study is in finding purely acoustical ways of supporting the performers. Field tests with musicians have showed that support is often welcomed even with normal hearing performers (Tuominen et al., 2013). This study replicates those tests with hearing and sight-impaired people.

One CI user has found that a felt-brimmed hat enables him to perceive his own voice clearer. The hat acts primarily as an extension of outer ear by giving more directivity: attenuation to unwanted environmental sounds and enhanced perception of own voice.

Methods of the study include tests in an anechoic chamber with and without added early reflection (20-80ms) employing quantitative measurements of musical synchronization (pitch and attack) in simulated ensemble situations.

The researchers firmly believe that studies with special need groups, such as CI users, reveal something hidden but useful, which may not be apparent for normal hearing performers.