

AN EXPERIMENTAL STUDY OF THE PERCEPTION OF STRESS AND INTONATION BY CHILDREN WITH COCHLEAR IMPLANTS

Rosemary O’Halpin,^{1,2} Andrew Faulkner,² Laura Viani¹

¹*Beaumont Cochlear Implant Programme, Beaumont Hospital, Dublin 9, Ireland*

²*Department of Phonetics and Linguistics, University College, London*

It is well documented for hearing listeners that the perceptual cues to stress and intonation (pitch, timing and loudness) are interdependent, but there is also experimental evidence that pitch makes syllables stand out and seem more prominent to hearing listeners. However, given the limitations of pitch information available through speech processors it is possible that cochlear implant users rely more on timing and loudness cues. These issues are investigated for a group of implanted children in controlled perception experiments using synthesised and natural speech. In the first experiment synthesised bisyllables with controlled changes in the acoustic parameters of stress (fundamental frequency, duration, amplitude) are presented to a group of implant users (age 7-16 years). The stimuli are graded in a set of same/different tasks using an adaptive programme with picture feedback. In the second experiment pairs of stimuli differing in stress pattern (e.g. a bluebell/ a blue bell) are recorded using four hearing speakers varying in age and gender. The stimuli are presented randomly in an identification task on a laptop computer to the same group of implant users and to a group of hearing children for comparison. Preliminary results indicate that in the controlled synthesised experiment, cochlear implant users have difficulty hearing differences in fundamental frequency only and respond better to changes in duration and amplitude. The experiments outlined above will be described in more detail, and the clinical and theoretical implications of the results will be discussed.