

Understanding the mechanisms of multimodal communication in cochlear implant users

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There has been much concern and assumptions about how visual language affects cross-modal reorganization of the auditory cortex and limits cochlear implant (CI) success, leading to ill-founded CI habilitation recommendations. In this talk, I provide an overview of my research on understanding how CI users process visual speech information from the talker's face (speechreading) and integrate this with auditory speech information from the talker's voice to aid communication. I first outline my PhD work where I used functional near-infrared spectroscopy to examine how the auditory cortex responds to auditory and visual speech signals in deaf adults before and after implantation. I highlight the synergistic link between the two modalities following implantation and the need to reevaluate the notion of maladaptive cross-modal plasticity in the context of everyday multimodal language and communication.

My current Postdoctoral Fellowship builds on this work by examining how deaf adolescents with CIs process linguistic (e.g. speechreading) and non-linguistic (e.g. eye gaze direction) social-communicative signals from the talker's face and how these may interact. I will present data from a preliminary online experiment in hearing controls that examined the modulating effect of speechreading on visual attention and orienting to eye gaze direction. Finally, I will talk about my upcoming studies with adolescent CI users that aim to determine how altered sensory and language experience impacts face processing mechanisms and perception of affective facial cues.