Investigating auditory-motor processing of speech sounds using transcranial magnetic stimulation

The link between speech perception and production is still poorly understood. Growing evidence shows that regions in the motor cortex that control the movements of the articulators (e.g., lips) activate during listening to speech. Whether these motor regions contribute to speech perception is under active debate. Transcranial magnetic stimulation (TMS) provides a powerful tool to investigate the role of the articulatory motor cortex in speech perception. In this talk, I will first present evidence that TMS-induced disruption of the lip motor representation impairs discrimination of speech sounds that differ in the place of articulation, supporting the idea that the articulatory motor cortex contributes to speech perception. I will then present evidence that the TMS-induced disruption of the lip motor representation modulates early auditory-cortex responses to speech sounds measured using electro- and magnetoencephalography. I will argue that these findings show that the auditory and motor cortex interact during speech processing. I will also discuss the effect of attention on these auditory-motor interactions.