

Speech Perception as a Sensorimotor Process. Evidence from Use-Induced Motor Plasticity

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Brain areas involved in the planning and execution of speech gestures have been repeatedly found to be activated in processing speech sounds. From these results, one fundamental question is whether the motor system might partly mediate speech perception through the internal generation of candidate articulatory categorizations. In the present study, we used a non-invasive behavioral technique based on use-induced activity-dependent plasticity in the orofacial motor system, with the goal of recalibrating action controllers that might be tapped by speech processing. To this aim, participants were required to repeatedly perform 150 lip-protrusion movements in order to induce changes in corticomotor control of the orofacial musculature. Subsequently, they performed a speeded identification task on acoustically presented /pa/ and /ta/ CV syllables. As compared to a control task performed at half-an-hour apart without motor training, a decrease of reaction times was observed, together with an increase of bilabial reported syllables. These results provide evidence for a mediating role of the motor system in speech perception. They will be discussed in relation to theories assuming a link between perception and action in the human speech processing system.