

58. An ERP Study on Temporal Recalibration for Delayed Auditory Feedback

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Summary:

Temporal consistency between a motor movement and its corresponding auditory feedback is crucial for perception of self-generated sound. The timing relationship between them, however, can be adapted by exposure to artificially delayed feedback. This phenomenon is known as “temporal recalibration” (Stetson, et al., 2006; Heron, et al., 2009), and here we conducted two experiments to investigate the neural correlates of temporal recalibration. In Experiment 1, we investigated the event-related potentials (ERPs) elicited by detection of delayed auditory feedback. With an oddball paradigm, twelve participants were told to count the number of times they could detect the delay of auditory feedback compared to their mouse-click movement. The delay of the target auditory stimulus was set to either 50 ms or 150 ms, while the standard stimulus was not delayed (0 ms). The participants detected the delay more frequently in the 150-ms delay session compared to the 50-ms session. We found the significant difference between P2 components for the target and standard stimulus only in the 150 ms session. In Experiment 2, after a short exposure phase to 100-ms-delayed auditory feedback, we conducted the experiment in which the standard and target auditory stimulus were delayed by 100 ms and 150 ms, respectively. The result showed that there was no significant difference between the target and standard stimulus on P2. These findings suggest that temporal recalibration between self-generated movement and auditory feedback occurs in early stage of auditory processing.

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