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## Visual and Auditory Stimuli Associated with Swallowing: An fMRI Study

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**Abstract:** We focused on brain areas activated by audiovisual stimuli related to swallowing motions. In this study, three kinds of stimuli related to human swallowing movement (auditory stimuli alone, visual stimuli alone, or audiovisual stimuli) were presented to the subjects, and activated brain areas were measured using fMRI and analyzed. When auditory stimuli alone were presented, the supplementary motor area was activated. When visual stimuli alone were presented, the premotor and primary motor areas of the left and right hemispheres and prefrontal area of the left hemisphere were activated. When audiovisual stimuli were presented, the prefrontal and premotor areas of the left and right hemispheres were activated. Activation of Broca's area, which would have been characteristic of mirror neuron system activation on presentation of motion images, was not observed; however, activation of brain areas related to swallowing motion programming and performance was verified for auditory, visual and audiovisual stimuli related to swallowing motion. These results suggest that audiovisual stimuli related to swallowing motion could be applied to the treatment of patients with dysphagia.

**Key words:** [Deglutition](#), [Supplementary motor area](#), [Premotor area](#), [Primary motor area](#), [Prefrontal area](#)

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