Audio-Visual Interaction

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In several percepts the combination of auditory (A) and visual (V) information from one source interact in the perception process. The interaction can facilitate perception under weak signal conditions, but it also can mislead a subject as is shown in several studies of ambiguity. We studied AV-interaction both in psychophysical and in neuro-imaging experiments (fMRI).
The first experiments are variations of the McGurk effect [1]. Subjects receive conflicting auditory and visual information about the vowel-consonant-vowel (vcv) syllable, where the vowel is an /a/ and the consonant is, e.g., visually presented as a /g/ whilst the auditory stimulus presents a /b/, indicating open *vs* closed lips. The visual stimulus dominates the reported percept as long as the timing is optimized. In a subsequent fMRI experiment correlated dependence of activation on synchronicity was observed in the IPL, SMG and SFG. The method did not provide a distinct result at the midbrain (IC), where the first interaction of auditory and visual information can occur.
In a subsequent series of experiments we use broadband frequency and time modulated stimuli: modulated pink noise for the auditory stimulus, and synchronized modulated checkerboard patterns for the visual stimulus. For these stimuli the perceptive interpretation is unclear, but activation in the brainstem (as well as in the brain) is apparent.

Key words:
AV interaction, brainstem, fMRI

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[1] McGurk H, MacDonald J. Hearing lips and seeing voices. Nature 1976, 264746-48.