

The Influence of Auditory and Visual Distractors on Human Orienting Gaze Shifts

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We studied the influences of competing visual and auditory stimuli on horizontal gaze shifts in humans. Gaze shifts were made to visual or auditory targets in the presence of either an irrelevant visual or auditory cue. Within an experiment, the target and irrelevant cue were either aligned (enhancer condition) or misaligned (distractor condition) in space. The times of presentation of the target and irrelevant cue were varied so that the target could have been presented before the irrelevant cue, or the irrelevant cue before the target. We compared subject performance in the enhancer and distractor conditions, measuring reaction latencies and the frequency of incorrect gaze shifts. Performance differed the most when the irrelevant cue was presented before the target and differed the least when the target was presented before the irrelevant cue. Our results reveal that, in addition to the spatial and temporal register of the stimuli, the experimental context in which the stimuli are presented also influences multisensory integration: an irrelevant auditory cue influenced gaze shifts to visual targets differently than an irrelevant visual cue influenced gaze shifts to auditory targets. Furthermore, we observed patterns of influence unique to either visual or auditory irrelevant cues that occurred regardless of the modality of the target. We believe that subjects adopted a state of motor readiness that reflected the unique demands of target selection in each experiment and that this state modulated the influences of the irrelevant cue on the target.

Key words: human; gaze shifts; visual; auditory; target selection; multisensory integration; visual fixation; motor readiness