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Morego

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Combination of visual and auditory information during normal vision and during saccades

ABSTRACT

Information from our five senses must be combined to produce a single unified percept of the world. Recent theory and evidence from many laboratories suggest that the combination does not occur in a rigid, hard-wired fashion, but follows flexible situation-dependent rules that allow information to be combined with maximal efficiency. For example, when vision and audition give conflicting information about spatial position, vision usually dominates (the well-known "ventriloquist effect"). However, when visual information is degraded (by blurring, for example), auditory information contributes to and may even dominate spatial localization. Importantly, localisation with dual (visual and auditory) sensory input is always more precise than with a single sensory modality, as predicted by Bayesian models assuming statistically ideal combination of signals. We have recently extended this technique to study visuo-auditory combination at the time of saccades. Many studies have shown that briefly displayed visual (but not auditory) stimuli presented near saccadic onset are systematically mislocalized, seen compressed towards the saccadic target. However, when visual and auditory stimuli are presented together at the time of saccades, audition partially dominates, so the perception becomes more veridical, and also more precise. The results are well explained by the Bayesian approach, and lead to a model for maintaining a stable spatiotopic map in the face of the continual destabilizing saccadic eye movements.