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  Visual localization and feature processing during saccadic eye movements

  The operation of visual processes is strongly affected by eye movements. Visual localization is distorted for stimuli that are briefly flashed in the wake of a saccadic eye movement. Objects flashed on a structured background appear compressed towards the saccade target. Compression occurs both in and orthogonal to saccade direction. Compression strength depends on contrast of the flash to the background. Objects flashed in the dark appear less compressed, but the apparent position of the saccade target is influenced by a presaccadically flashed object. The saccade target position appears shifted towards the flashed object. Together, these observations suggest that perisaccadic mislocalization arises from compression of the visual distances between elements of the presaccadic scene plus an uncertainty about postsaccadic target location. A neurocomputational model assumes distortions in the visuo-spatial map due to modulatory feedback from saccade generation centers. This feedback enhances processing and focusses attention around the saccade target, but induces spatial compression. Taking account of cortical magnification factors explains the observed asymmetry of the 2D compression pattern. The compression affects only the location of the presented objects, not their visual properties or identity. When objects of different colors or shapes are flashed before a saccade they appear to overlap in space, but their individual features remain distinguishable and compete for access to visual awareness.

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