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Saccadic eye movements as a measure of perceptual decision-making

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Abstract: We have examined the processes involved in decision-making using saccadic eye movements. These explicit behavioural metrics (e.g., trajectory, landing position) can be readily tied to established neural correlates. The eye movements of participants were recorded as they were asked to saccade to one of two peripheral stimuli on the basis of a random dot motion-coherence patch. The level of coherence was varied. As motion-coherence diminished, correct performance decreased, and saccade metrics were found to become more affected by the non-target location, i.e., with decreasing motion-coherence strength they were drawn toward the non-target location. As decision difficulty increased the influence of the other possible alternative became more apparent in the eye movement response, reflecting the weight of evidence for the choice. We suggest that the extent of this is a direct behavioural measure of the relative neural activation associated with each visual stimulus' location.