The Effect of Post Cueing Delay on Saccadic Latency in the Execution of Remembered Antisaccades

Sieu Khuu, Revathy Mani and Lisa Asper

School of Optometry and Vision Science, The University of New South Wales (UNSW Sydney), Australia

Purpose

- Volitional saccades towards and in a direction opposite to a remembered target location have been quantified as a means of assessing working memory and response inhibition.1,2,3
- We seek to establish how saccadic eye movement latency for remembered antisaccades systematically changes over a range of delays after the target location has been cued and remembered.
- Our goal was to understand the temporal constraints of how working memory and response inhibition affect volitional eye movements.

Methods

- Eight subjects (mean age = 31yr ±16, six females) participated in the study.
- While fixating at a central white stimulus, a peripheral black square appeared for 100ms in the left or right visual field and then disappeared. An antisaccade (eye movement in opposite direction) was made to the remembered target location after a central visual cue appeared.
- The Gaze point (GP3) eye tracker, with a sampling rate of 150Hz and spatial resolution of 0.1⁰, recorded eye movements. Outcome measures were saccadic latency, number of disinhinitions and directional errors.
  - Disinhibition (%) = \( \frac{\text{number of eye movements during delay} \times 100}{\text{total number of trials}} \)
  - Directional error (%) = \( \frac{\text{number of eye movements after delay} \times 100}{\text{total number of trials}} \)

Results

- Delay period significantly affected the latencies of remembered antisaccade (F (5,30) = 6.3, \( p = 0.0004 \)).
- Mean saccadic latency was longer for 0 delay compared to 0.250, 0.500, 1 and 2s (Post-hoc, \( p < 0.05 \)) but not for 0.125sec.
- At short delays, particularly at 0 and 0.125s, observers took more time to make a saccade in a direction opposite to the remembered location.
- Delay duration did not significantly change the disinhibition and directional error rates.

Conclusions

- Remembered antisaccades with shorter delays showed longer latencies.
- Delay period does not affect the disinhibition and directional errors in normally sighted individuals.

References


Contact

email: s.khuu@unsw.edu.au (Sieu Khuu)

Disclosures: None