

Interactions between Hand Posture and Eye Movement

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Background

Previous research has suggested that vision changes when the hands are close to a visual object

- **Delayed attentional disengagement** (Abrams, Davoli, Du, Knapp, and Paull, 2008)
- **Enhanced magnocellular processing** (Abrams & Weidler, in press; Gozli, West, & Pratt, 2012)

Research Questions

Overt control of attention is necessary to deal with potentially important visual objects

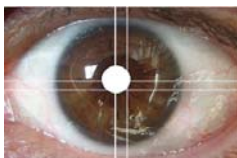


Magnocellular pathway enables control of eye-movement (Lovejoy & Krauzlis, 2010; White & Munoz, 2011)

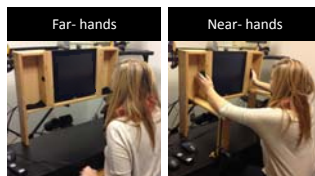
- How would hand posture influence saccadic eye movements?
- Would initiation of saccadic eye movements be delayed near the hands as has been shown with covert attention?
- Would hand posture modulate the accuracy of the eye movements?

Method

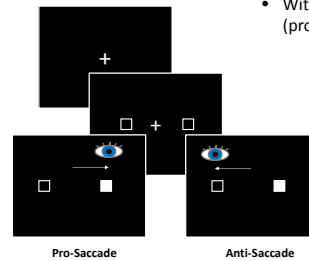
• Eye movement monitoring



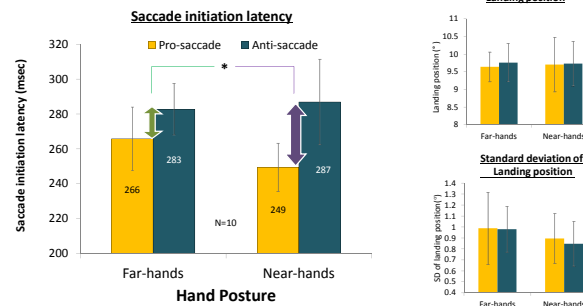
• Hand posture manipulations



Experiment 1

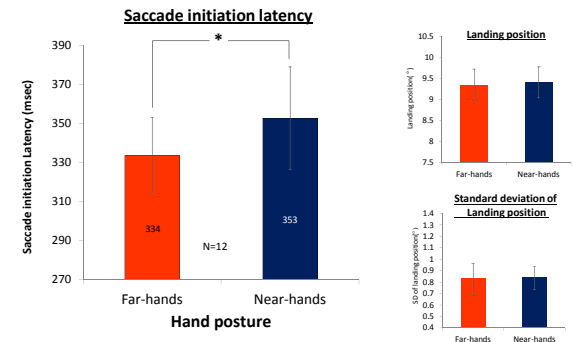
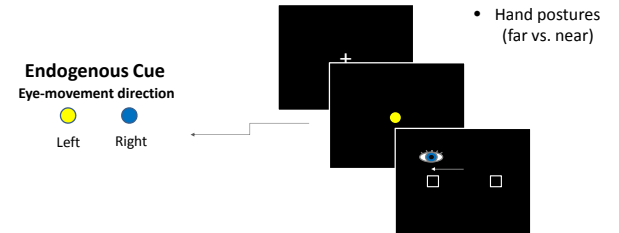


- Within subject design: Task types (pro- vs. anti-saccade) x Hand postures (far vs. near)



- The anti-saccade cost was greater near the hands
- Hand posture did not affect saccade accuracy
- Results suggest delayed disengagement from the cue in the anti-saccade task near the hands

Experiment 2



- Endogenous saccade initiation latency was slower near the hands
- Hand posture did not affect saccade accuracy
- Results suggest delayed attentional disengagement from the endogenous color-cue near the hands

Summary

1. Hand proximity influences allocation of overt attention
2. Initiation of anti-saccades and endogenous saccades is delayed near the hands
3. Hand proximity does not influence accuracy of the eye movement
4. Delayed attentional disengagement may underlie the effect

References

Abrams, R. A., Davoli, C. C., Du, F., Knapp, W. H., & Paull, D. (2008). Altered vision near the hands. *Cognition*, 107, 1035-1047.
 Abrams, R. A., & Weidler, B. J. (in press). Tradeoffs in visual processing for stimuli near the hands. *Attention, Perception, & Psychophysics*.
 Gozli, D. G., West, G. L., & Pratt, J. (2012). Hand position alters vision by biasing through different visual pathways. *Cognition*, 124, 244-250.
 Lovejoy, L. P., & Krauzlis, R. J. (2009). Inactivation of primate superior colliculus impairs covert selection of signals for perceptual judgments. *Nature neuroscience*, 13(2), 261-266.
 White, B. J., & Munoz, D. P. (2011). Separate visual signals for saccade initiation during target selection in the primate superior colliculus. *The Journal of Neuroscience*, 31(5), 1570-1578.