

Blinded by Magic: Electrophysiological Correlates of Change Blindness

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Introduction

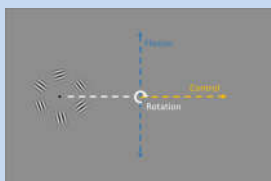
- Magic tricks prove that our vision is not as accurate as we think
- Using misdirection, magicians can hide their method for a trick in plain sight by effecting change blindness
- Individuals experience change blindness when there is a sudden change in the direction of movement
- The purpose of this study is to find the reason for why an individual is induced with change blindness

Methods

- Number of subjects = 28 (age range = 17-36)
- Number of trials = 6 blocks of 48 trials

Task Stimuli

- Each trial began with an array of 6 Gabor patches with a fixated dot that subjects were instructed to keep their eyes on
- As the array traveled to the center of the screen, it changed direction vertically at 90 degrees or continued horizontally
- When the array switched direction, one of the Gabor patches rotated 30 degrees simultaneously
- Subjects were asked to identify which patch rotated and EEG (electroencephalography) data was recorded as they performed the task

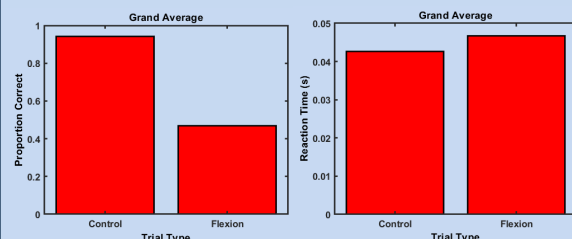


Eye-tracking

- Eye-tracking was simultaneously recorded with EEG data

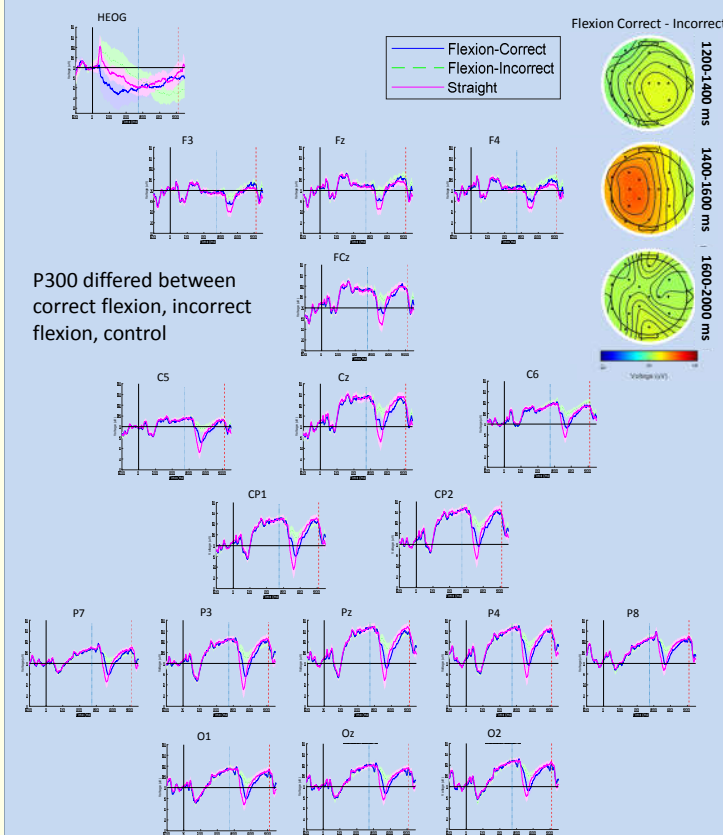


Behavioral Results



- Reaction time slower in flexion trials
- More accuracy on control trials

ERP Results

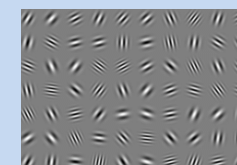


Discussion

- Change in direction affected ability to see Gabor change
- Reaction time is slower in flexion trials
- P300 differed between correct flexion, incorrect flexion, and control trials
- P300 difference demonstrates that attention is automatically drawn to a larger change in stimuli
- P300 can be interpreted as a marker of consciousness

Future Directions

- Time-frequency analysis (power and phase)
- Follow-up experiments:
 - Small vs. large Gabor
 - Asynchronous timing between direction change and Gabor rotation
 - Higher vs. lower Gabor frequency
 - Degree of Gabor rotation



References

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2. Mathewson, K. E., Uleras, A., Beck, D. M., Fabiani, M., Ro, T., & Gratton, G. (2011). Pulsed out of awareness: EEG alpha oscillations represent a pulsed-inhibition of ongoing cortical processing. *Frontiers in Psychology*, 2, Article 99.
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