Electroencephalogram (EEG) data is able to indicate driver distraction, but not to estimate performance during take over control

Can EEG Measurements be Used to Estimate the Performance of Taking over Control from an Autonomous Vehicle for Different Levels of Distracted Driving? An Explorative Study

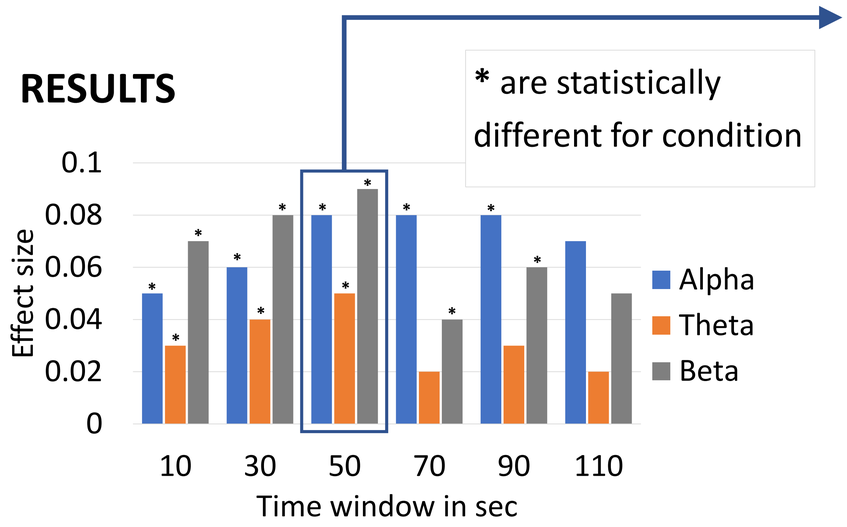
INTRO

- Previous research focused on relationship between eyes-off-road metrics and driving performance
- Current study focuses on addressing cognitive aspects of distracted driving

METHODS

- N = 23
- Collected time-to-collision, reaction time and EEG during three conditions: no, low and high distraction
- EEG on theta, alpha and beta band powers at different time windows
- Tested with linear mixed-effects model analyses

RESULTS

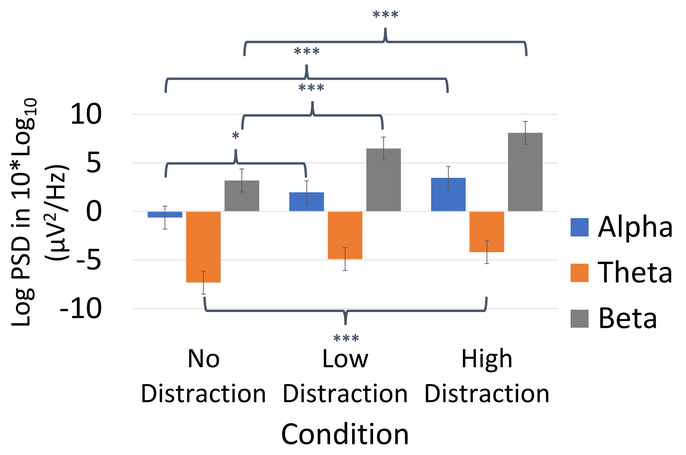


- None of band powers appear to be related to taking over control performance

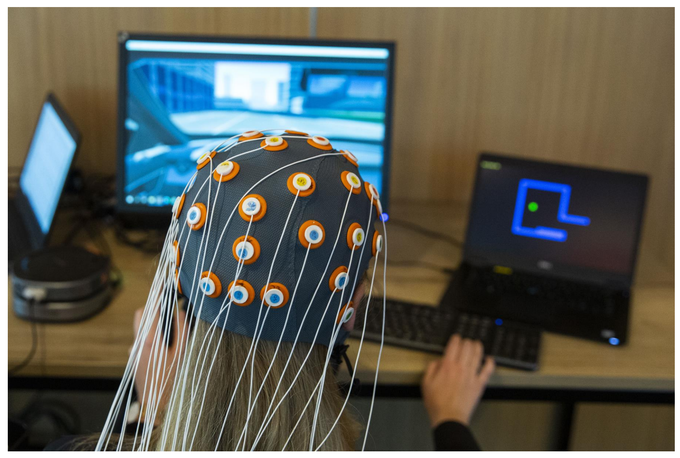
DISCUSSION

- Able to indicate not only whether the participant is distracted or not, but also indicates a trend in how mentally challenging that distraction is

POST-HOC ANALYSIS



- alpha/beta band powers are statistically different in baseline compared to *both* distractions
- theta band power is only statistically different in baseline compared to *high* distraction



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