

# The Relationship between Cumulative Stress Exposure and Hippocampal Activation during Contextual Memory

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## Background

- Context Separation and Completion Task (CSC; Duval et al., in prep)
  - Created task to assess encoding and retrieval of complex contextual scenes
- Relevance to fear learning in PTSD
  - Critical to encode and retrieve contextual information to disambiguate potential threat cues (Garfinkel et al., 2014)
- Stressful events are common even in a healthy population
  - About 90% of people will be exposed to at least one traumatic event in their lifetime (Kilpatrick et al., 2013)
  - Life event stress associated with working memory deficits (Klein & Boals, 2001)
- The purpose of this study was to investigate if total reported stressful events was related to neural activation involved in encoding and retrieval of complex scenes

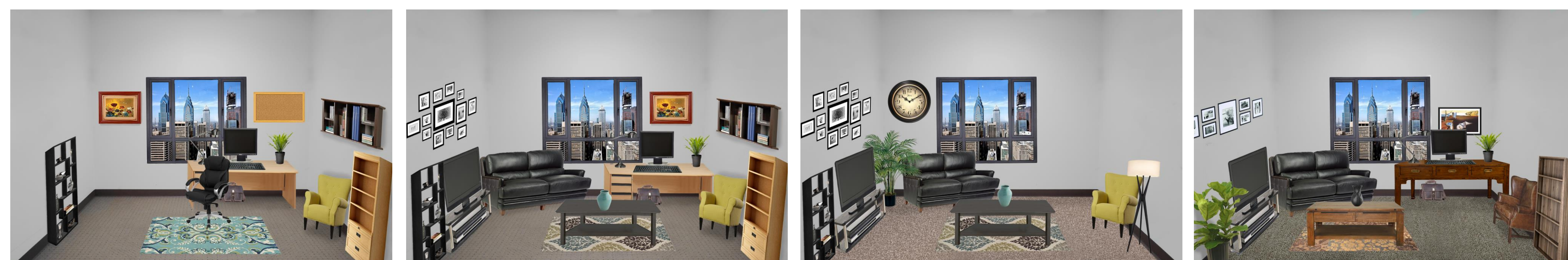
## Method

- 26 healthy adults (*M age*= 27.9, 69.2% Female, 53.8% Caucasian)
- Participants completed Life Events Checklist (LEC; Weathers et al., 2013)
  - Focused on reported "happened to me" stressful events

Encoding:



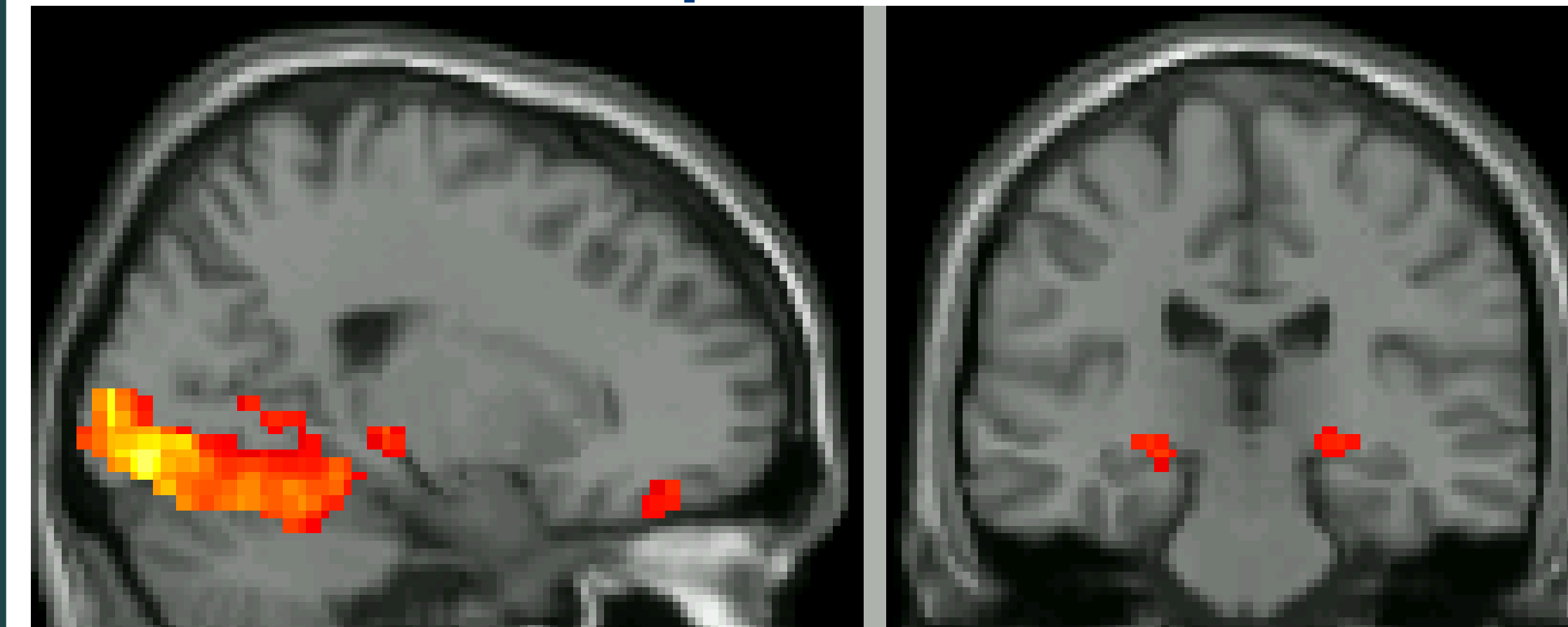
Retrieval:



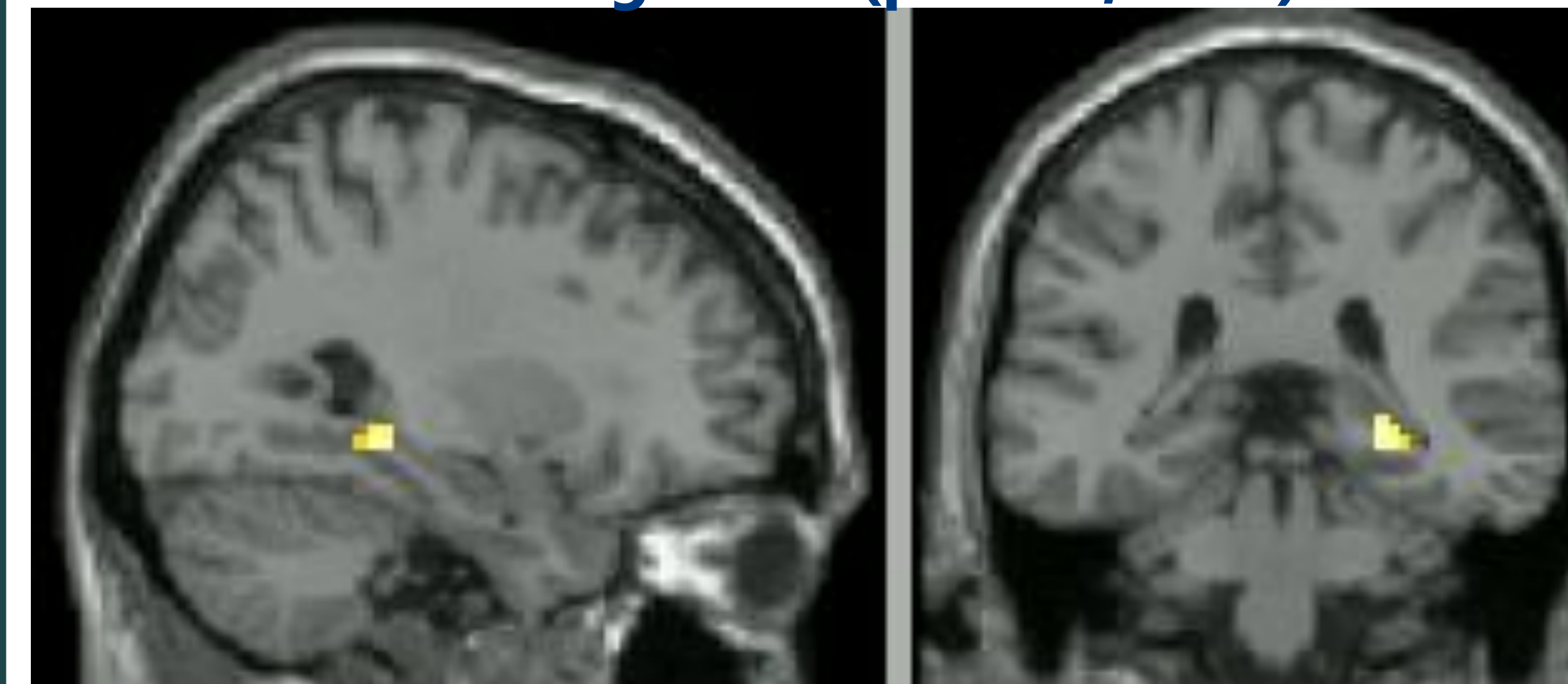
Office, Living Room, Indistinguishable, or New?

## Results

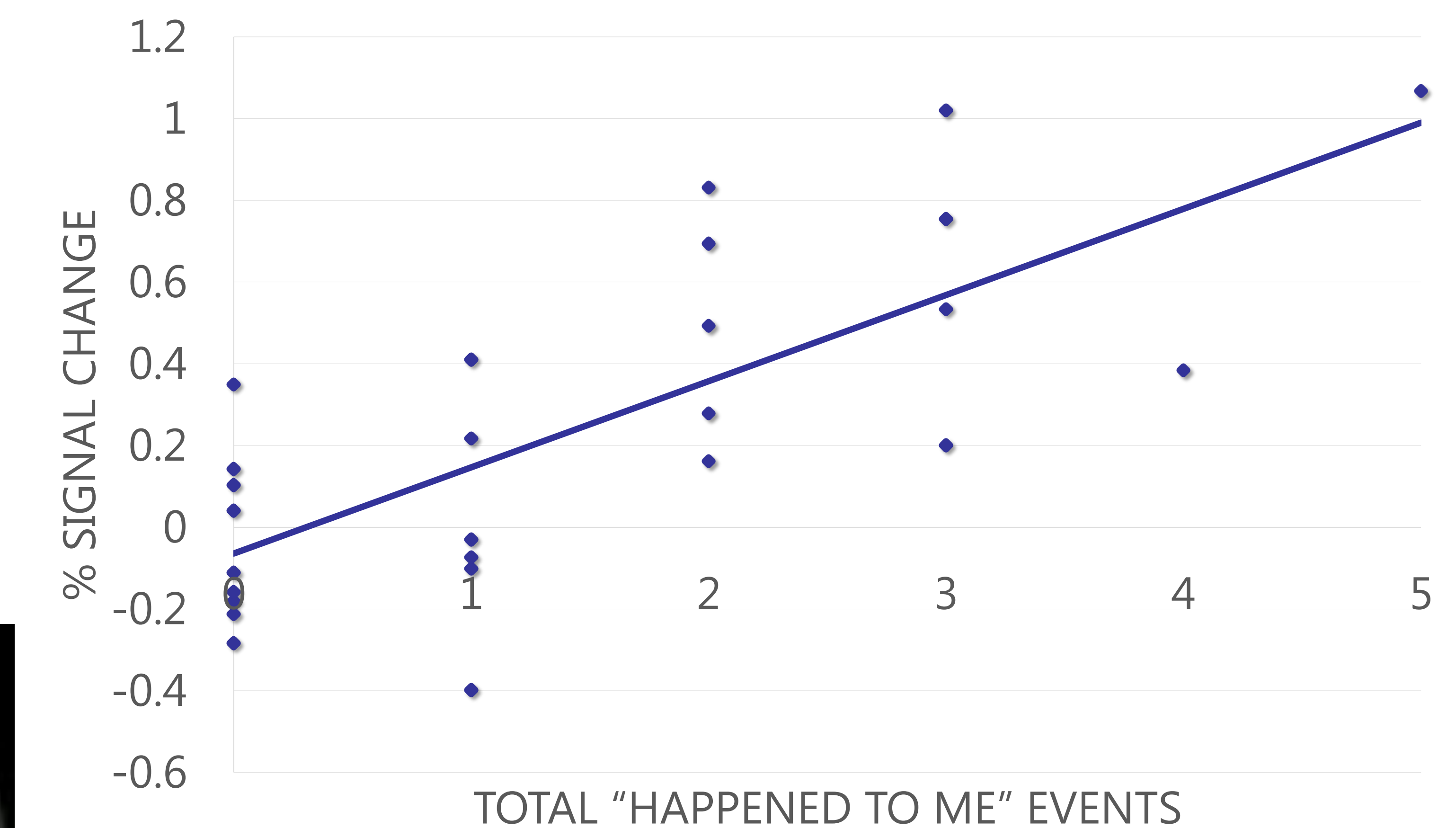
All Trials > Baseline ( $p < .05$ , FWE)



Stressful Events Regressor ( $p < .05$ , FWE)



Peak coordinate: 30 -37 -8



## Accuracy

- There was no relationship between activation in hippocampus and accuracy ( $p > .05$ ).
- There was no relationship between number of stressful life events experienced and accuracy ( $p > .05$ ).

## Conclusions & Future Directions

- Hippocampus is involved in encoding and retrieval of complex scenes during CSC task, consistent with prior reports of hippocampal involvement in encoding and retrieval (Bakker et al., 2008; Lacy et al., 2011; Stark et al., 2013)
- Reported total number of "happened to me" stressful life events was positively associated with hippocampal activation during CSC
  - Accuracy on CSC task was not associated with number of stressful events or hippocampal activation
  - Findings suggest participants with more cumulative stress require more hippocampal resources to perform CSC effectively
- Next steps:
  - Increase sample size to improve power; further investigate relationships between performance and brain function
  - Use CSC to examine memory of complex contextual scenes in PTSD population

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