



Anxiety and Stress Symptoms Predict Hippocampal-Dependent Contextualizing Processes

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Background

- Contextual processing (the ability to disambiguate potential threat based on environmental information)
 - may underlie posttraumatic stress disorder (PTSD) and other pathologies
 - Hippocampal-dependent processes associated with memory encoding and recall, including pattern separation (PS) and pattern completion (PC), are important components of contextualization capacities
 - Deficits in these processes could contribute to the impaired safety learning and fear modulation observed in anxiety and stress disorders
- **Purpose:** Examine relationships between hippocampal function underlying PS and PC of complex contextual scenes and anxiety/stress symptoms

Method

- 26 healthy adults (*M age*= 26.1, 73.1% Female)
- Symptom assessment: State Trait Anxiety Inventory (STAI) and Clinician Administered PTSD Scale for DSM 5 (CAPS-5)
- fMRI with reduced FOV targeting hippocampus to assess PS/PC associated neural function
 - Context Separation and Completion Task (CSC; Duval et al., in prep)
 - Pattern completion (PC): accurately identified office and living room
 - Pattern separation (PS): accurately identified new images

Encoding:



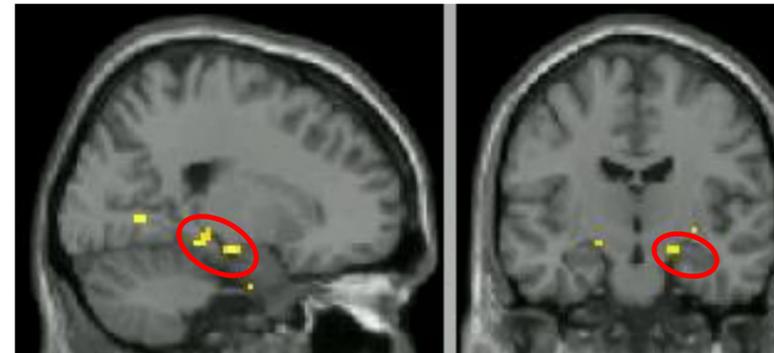
Recall:



Office, living room, Indistinguishable, or new?

Results

Hippocampal activation was positively associated with PC performance ($p = .037$, FWE SVC)

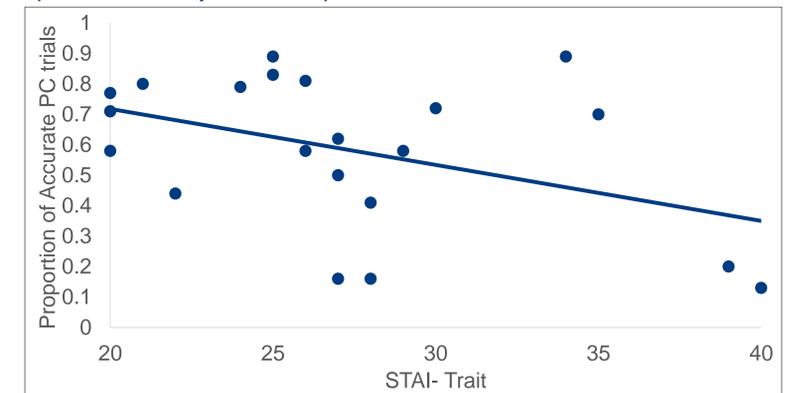
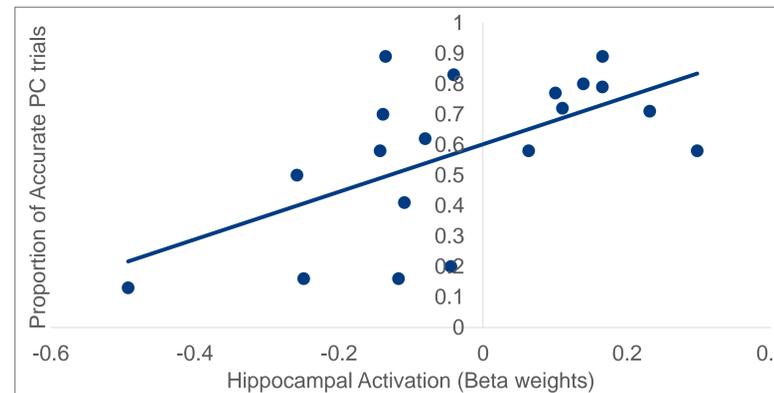


Trait anxiety and PTSD symptoms predicted PC performance, [$F(2, 19) = 3.69$, $p = .044$]

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.529 ^a	.280	.204	.21838753

a. Predictors: (Constant), CAPS_Total, STAI_TraitTotal

Trait anxiety was a significant contributor ($B = -.542$, $p = .017$)



Summary

- Better PC performance associated with greater hippocampal function
- Higher levels of anxiety and stress associated with diminished capacity for PC
 - Consistent with the hypothesis that deficiencies in hippocampal-dependent contextual processing could contribute to anxiety and stress vulnerability
- Ongoing data collection on hippocampal-dependent contextualization and memory in adults with PTSD

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