

Neural reactivity in comorbid PTSD and AUD: An investigation by trauma type

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Background

- **Posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) commonly co-occur, yet there is limited knowledge of the neurobiology of this comorbid population.**
- Frontal and limbic regions of the brain are hyperactive in individuals with PTSD.
 - Frontal lobe is associated with inhibition and decision making; limbic regions are responsible for emotional, behavioral, stress responses.
- Interpersonal trauma is a result of traumatic interactions between people, including physical and sexual assault.
 - Individuals who have experienced an interpersonal trauma are more likely to have PTSD.
 - Experiencing interpersonal trauma may be associated with a more severe symptom profile than other types of trauma.

Objective and Hypotheses

- **Objective:** Investigate if trauma type (interpersonal vs non-interpersonal) is associated with neural reactivity among individuals with comorbid PTSD and AUD.
- **Hypotheses:** Participants with interpersonal trauma (vs non-interpersonal trauma) would have greater activation in:
 - 1) The cingulate cortex, precuneus, superior occipital gyrus, and middle frontal gyrus during the trauma vs neutral cue.
 - 2) The medial prefrontal cortex and limbic regions during the alcohol vs neutral cue.

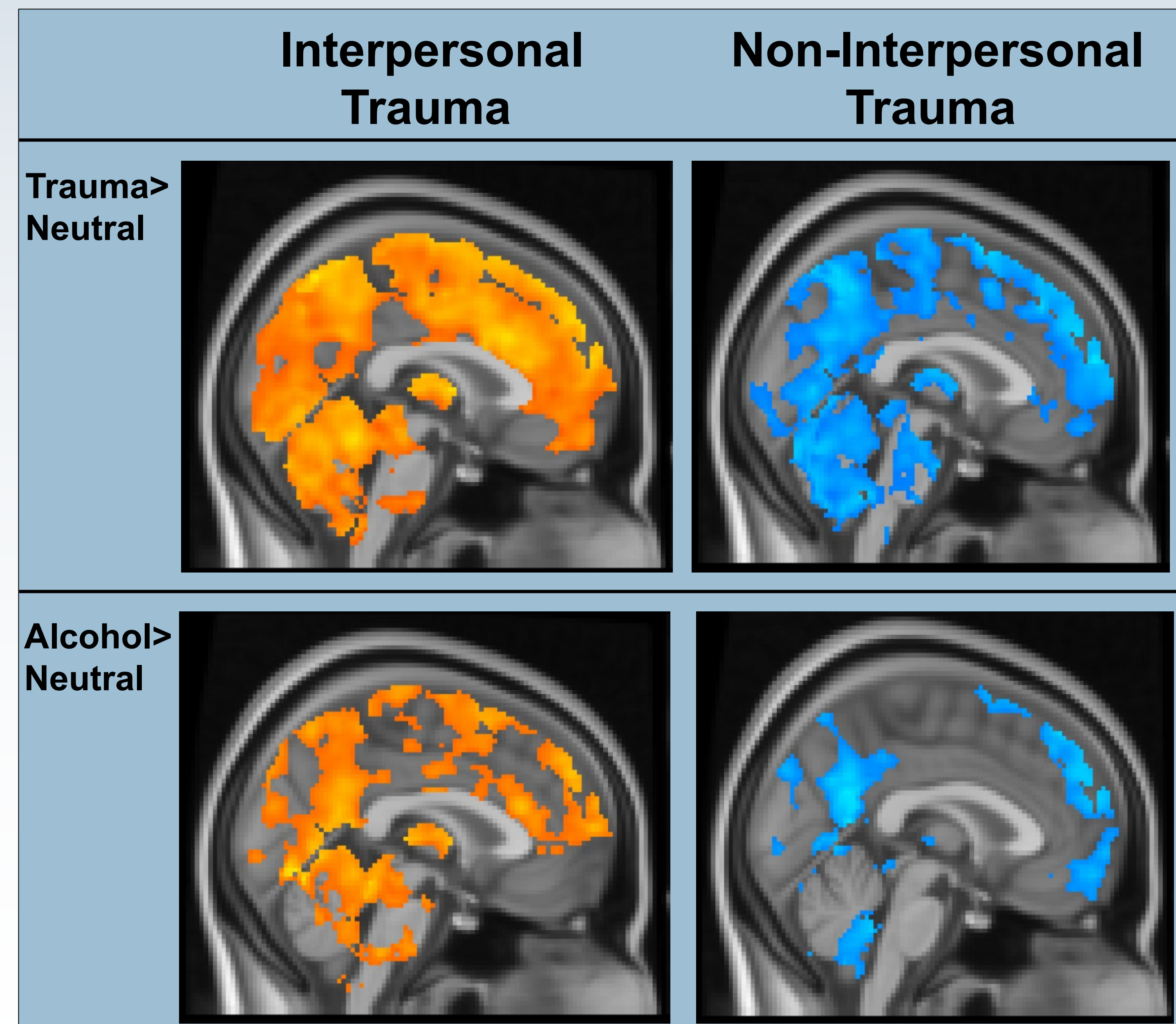
Methods

- Participants (N=27) were enrolled in a larger randomized controlled trial.
- Participants listened to personalized trauma, alcohol, and neutral imagery scripts (cues) during a functional magnetic resonance imaging (fMRI) scanning procedure.
 - Sample quote from neutral script:
 - “You grab one of your water bottles and take a sip of cool, refreshing water. The tension in your body melts away. You listen to the rain outside and try to keep your mind clear. Your breathing slows. You feel a general sense of release.”
- Participants were grouped by interpersonal (N=18) and non-interpersonal (N=9) trauma types.
- Data were preprocessed and FEAT was used to analyze fMRI data. Trauma type was entered as a predictor in voxel-wise analyses.

Results

Participant Characteristics	Interpersonal Trauma (N=18)	Non-Interpersonal Trauma (N=9)
	N (%) / Mean (SD)	N (%) / Mean (SD)
Sex, n (%)		
Female	12 (66.67%)	3 (33.33%)
Male	6 (33.33%)	6 (66.67%)
Age (years)	40.56 (12.25)	40.67 (14.30)
Race, n (%)		
Black or African American	2 (11.11%)	2 (22.22%)
White/ Caucasian	16 (88.89%)	7 (77.78%)
Ethnicity, n (%)		
Hispanic	17 (94.44%)	9 (100%)
Non-Hispanic	1 (5.56%)	0 (0%)
Clinical Characteristics		
AUDIT (Alcohol Use)	20.61 (9.08)	20.44 (8.93)
BDI (Depression)	24.89 (12.98)	27.22 (9.42)
PCL (PTSD)	40.39 (16.5)	32.89 (10.58)

Individuals who have experienced interpersonal trauma present with similar neural reactivity as individuals who have experienced non-interpersonal trauma



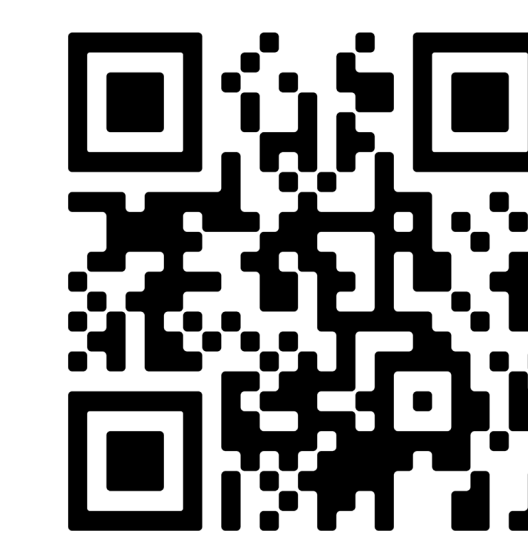
Results Continued

- There were no significant differences in demographic or clinical characteristics by trauma type.
- There were no significant differences in neural activation by trauma type for either cue comparison.
- Peak activation for the trauma>neutral cue was found in the:
 - Left inferior frontal gyrus (interpersonal trauma group)
 - Right superior temporal gyrus (non-interpersonal trauma group)
- Peak activation for the alcohol>neutral cue was found in the:
 - Left inferior frontal gyrus (interpersonal trauma group)
 - Temporal pole and superior frontal gyrus (non-interpersonal trauma group)

Conclusions

- Even though, the areas of peak activation were different by trauma type, similar neural reactivity by trauma type was noted among individuals with PTSD and AUD.
- Although preliminary, the findings suggest that individualized treatments may not require specialization based on trauma type.
- Limitations include a small, predominately white sample. Replication with larger, more diverse samples is needed.
- In addition, data were not available for age at which trauma occurred and total number of traumas experienced. Future research will examine these factors.
- More research is needed to better understand the neurobiology of how alcohol impacts neural reactivity among individuals with PTSD.

References



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