

# Ethnoracial Effects in Reactivity to Alcohol Cues in Comorbid PTSD and Alcohol Use Disorder

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## Background

- AUD/PTSD commonly co-occur with one another; lifetime prevalence rates of AUD among US adults is 29.1%, and AUD linked to 30% increased odds of PTSD
- AUD has a lower prevalence rate in white populations than Black populations; however, Black and Hispanic drinkers are more likely to experience AUD symptoms and negative drinking consequences, as compared to their White counterparts
- These ethnoracial differences in severity of drinking patterns can be due to a variety of reasons, including racial/ethnic stigma, economic disadvantage, and higher density of alcohol outlets in urban areas that contain ethnic minorities
- There is a gap in research concerning possible ethnoracial differences in AUD/PTSD comorbidity, and its possible neural basis.

## Aims

The aim of this study was to determine if there is a difference in neural responses to alcohol, trauma, and neutral auditory scripts based on race and alcohol use severity among individuals with comorbid PTSD/AUD.

## Methods

### Participants

- 51 participants (35% Black/African American) who met DSM-5 criteria for current (i.e., last 6 months) AUD, as determined by the MINI 7.0, and for current (i.e., last month) PTSD, as measured by the CAPS-5.

### Measures

- Clinical Administered PTSD Scale (CAPS-5)
- PTSD Checklist (PCL-5)
- Alcohol Use Disorders Identification Test (AUDIT)
- Timeline Follow Back (TLFB)
  - Percent drinking days (PDD)
  - Percent heavy drinking days (PHDD)

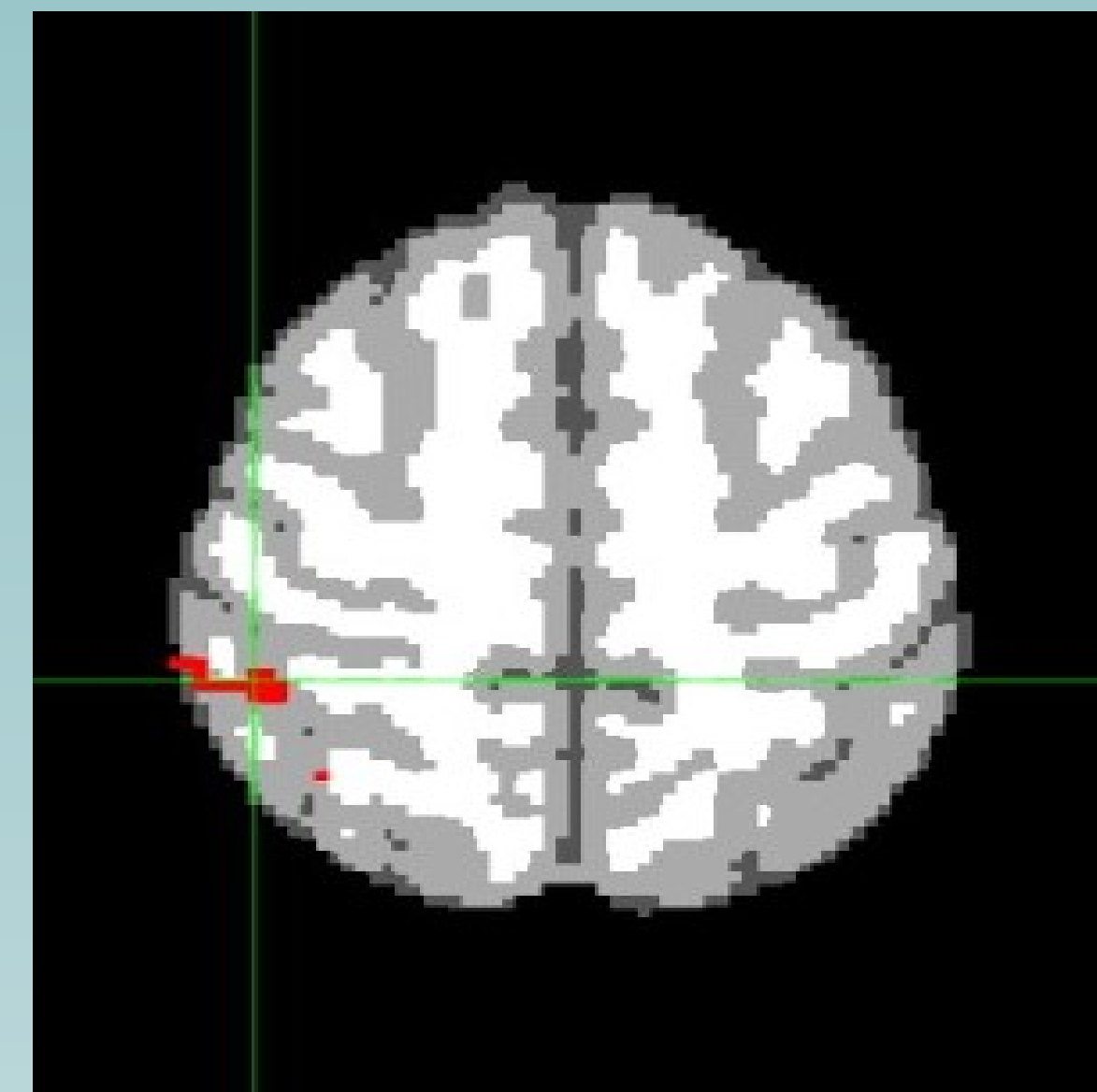
### fMRI Visit

- Scan conducted on a Siemens 3T PRISMA Trio MRI scanner.
- Used a block design consisting of one 12-minute run.
  - Trauma cue: Audio recording describing their traumatic event.
  - Neutral cue: Audio recording describing their relaxing scenario.
  - Alcohol cue: Audio recording describing in detail a time they consumed alcohol.
- Visual analog craving scale was elicited from participants before and after the presentation of auditory cues.

### Analysis

- Statistical analysis of imaging data was performed using FEAT (fMRI Expert Analysis Tool).
- After standard preprocessing steps, a group analysis was conducted to examine areas of activation in response to substance cues versus baseline, trauma cues versus baseline, alcohol > trauma or trauma > alcohol cues. Race, alcohol use, and the interaction of race x alcohol use were included as predictors in the models.

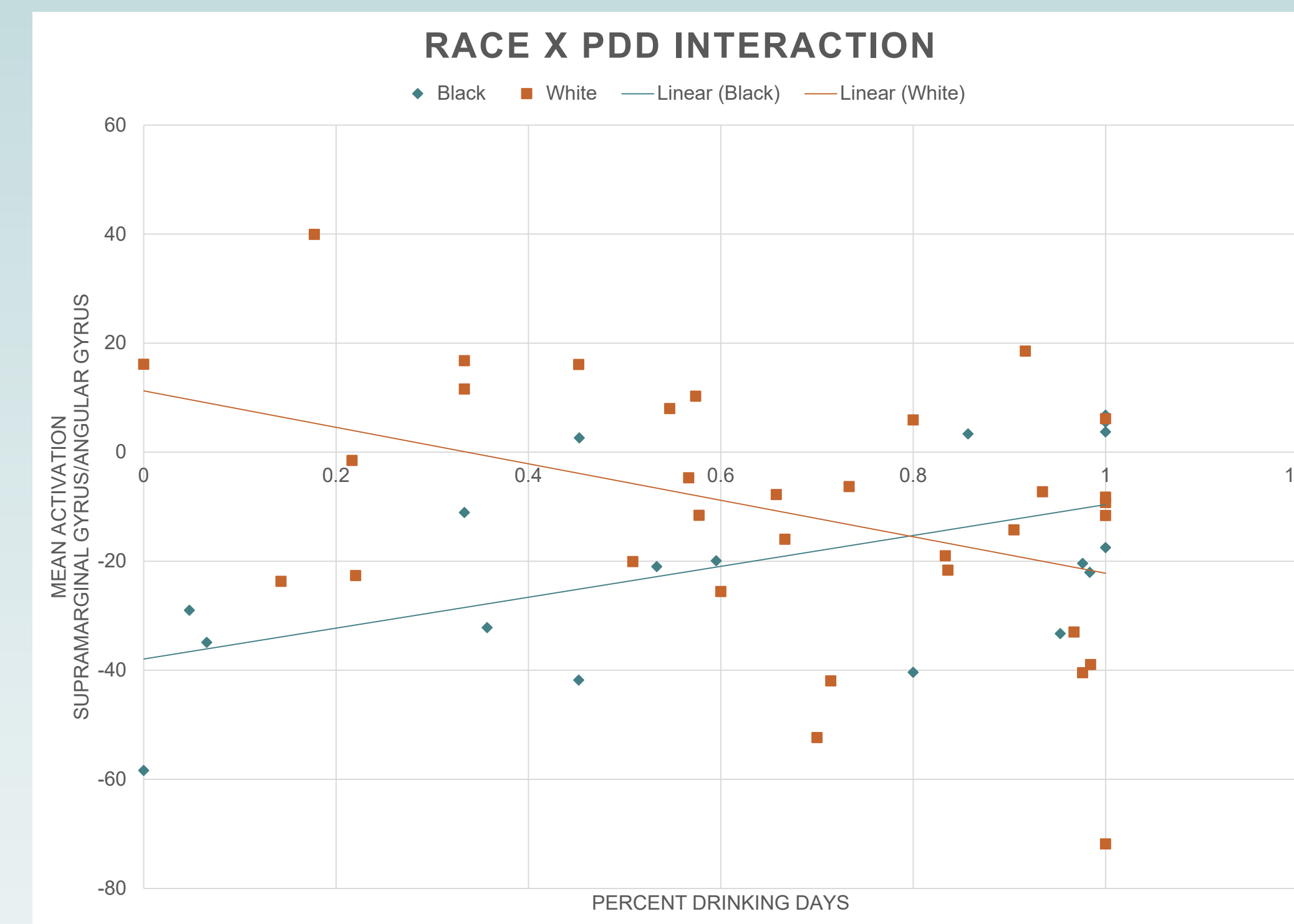
## Results



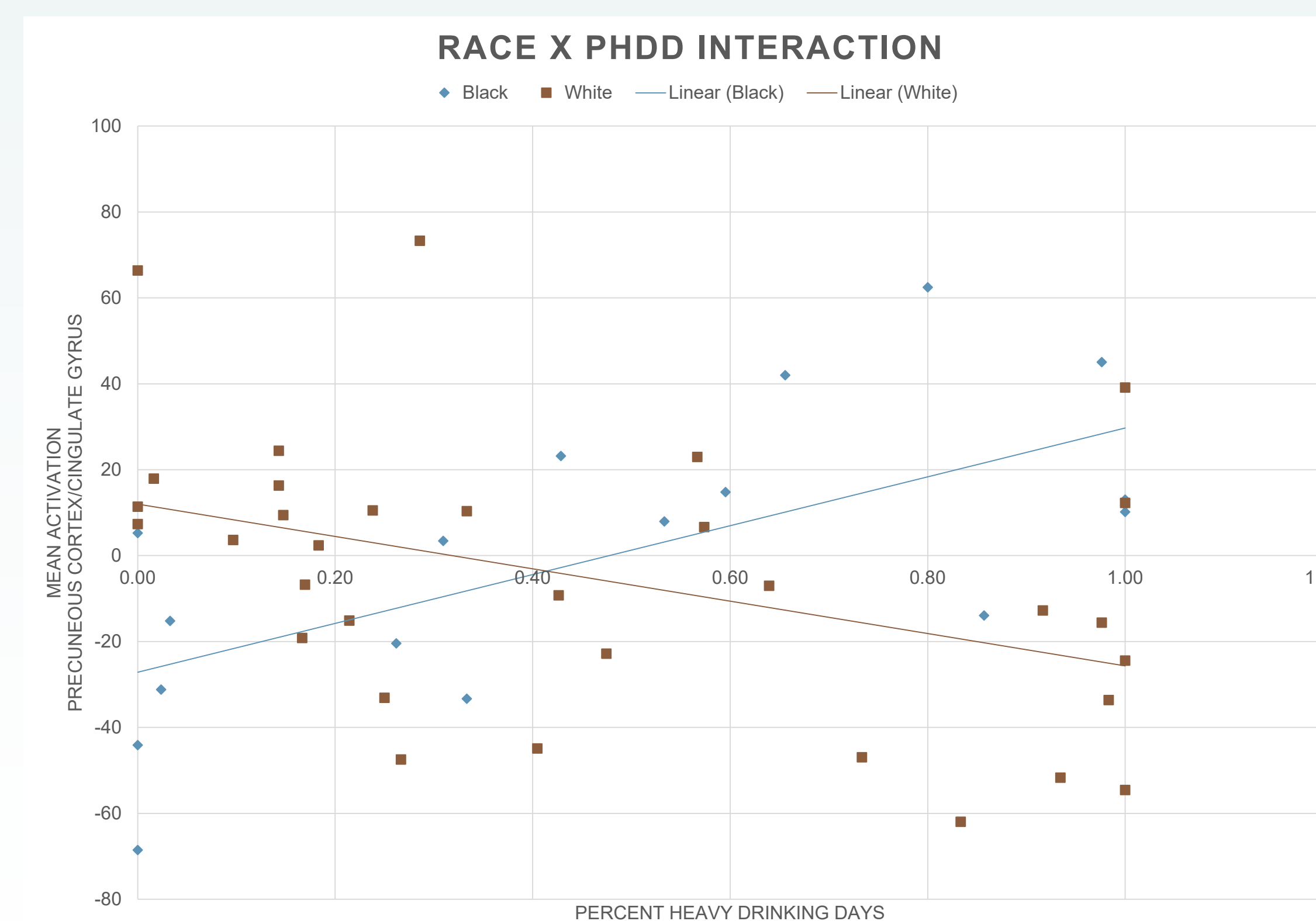
For the Alcohol > Neutral contrast, there was a Race x PDD interaction in the supramarginal gyrus/angular gyrus



For the Alcohol > Trauma contrast, there was a Race x PHDD interaction in the precuneus cortex/cingulate gyrus



In the Alcohol>baseline contrast, higher PDD scores were associated with more supramarginal/angular gyrus activation to alcohol scripts in Black participants.



In the Alcohol>Trauma contrast Higher PHDD scores were associated with more precuneus cortex/cingulate gyrus activation to alcohol scripts in Black participants.

## Conclusions

- Results from this study suggests that among Black/African Americans who are heavy drinkers, there is more activation in the supramarginal/angular gyrus, as well as the precuneus cortex/cingulate gyrus.
- The supramarginal gyrus and angular gyrus are crucial for the retrieval of memories concerning enacted actions, as well as attention
- The precuneus cortex is primarily concerned with memory, and the cingulate gyrus has many functions, including processing autobiographical memory, emotional stimuli, and regulating internal/external attention
- The activations of regions primarily associated with memory and attention could mean that substances, such as alcohol, enhance positive learning and memory about the drug
  - Behavior, in turn, can become increasingly directed towards obtaining and using substances, while at the same time developing a poorer ability to stop using, even when the substance is not as rewarding or interferes with functioning in other facets of life
  - Drinking consequences and alcohol-related harm (e.g., negative health or social consequences) could be more severe for heavy drinkers that are Black/African American
- Increased spontaneous activity in the cingulate cortex as well as the angular gyrus has also been linked to PTSD symptoms
- The main limitation of the study was the sample size. The small number of Black/African American participants in the sample prevents us from drawing firm conclusions.
- This study suggests that there is a difference in attention to alcohol cues, which could inform different ways that comorbid PTSD/AUD treatment can be addressed among racial/ethnic populations to create more effective interventions.

## References



## Acknowledgements

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