

Gender differentiates how facial expressions are processed in the brains of alcoholics

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Should treatment of alcoholics be different based on gender? Yes, according to a new study that shows that alcoholic men and women respond differently to their disease resulting in different levels of brain activity and brain abnormalities. Research indicates that they distinguish facial expressions differently and that this is an important clue as to how treatment strategies might be tailored.

Chronic long-term Alcohol Use Disorder (AUD) or "alcoholism," is a harmful condition that has been associated with deficits in emotion and memory, including memory for the emotional expressions of faces. In addition to its effects on memory for facial emotions, AUD also has been associated with impairments in the processing of facial emotional expressions which can endure after months or years of sobriety.

While prior studies have shown that ones' gender influences alcohol's impacts on the [brain](#), this new

research has found that the brain responds to emotional [facial expressions](#) differently in men and [women](#). "Surprisingly, there were brain abnormalities for abstinent men with AUD that turned out to be unlike the abnormalities of abstinent women with AUD," said corresponding author and research scientist Kayle S. Sawyer, Ph.D., from the Psychology Research Service of the VA Boston Healthcare System, the department of anatomy and neurobiology at Boston University School of Medicine (BUSM), and radiology at Massachusetts General Hospital (MGH).

This project, led by BUSM's Marlene Oscar Berman, Ph.D., and MGH's Gordon Harris, Ph.D., used [functional magnetic resonance](#) imaging (fMRI) to measure the brain activity of a group of men and women with and without a history of AUD while they completed an emotional face memory task. The researchers then looked at activation differences between when they were looking at a fixation stimulus (plus signs) and when they were looking at photographs of faces with different facial expressions.

They found the faces elicited a similar overall pattern of activation for all four groups. "But when we compared the groups, we noticed important differences in their levels of activation. For example, the alcoholic men showed abnormally high activity in the frontal area of the brain that was not obvious in the alcoholic women," explained Sawyer. "These findings indicate that the experiences and mechanisms of alcohol addiction differ for the two genders," he added.

The researchers believe this study has implications for [clinical research](#) and more generally suggests that clinicians should consider gender carefully when treating alcohol use disorders.

"Researchers should examine gender differences in many medical conditions, so that prevention and treatment strategies can be better tailored to individuals instead of applied generically using group averages. One important way that they can be tailored is by treating men and women differently when that is appropriate and beneficial and when justified by the research."

Prior research by this same group found abstinent alcoholic men have more diminished brain activity in areas responsible for emotional processing (limbic regions including the amygdala and hippocampus), as well as memory and social processing (cortical regions including the superior frontal and supramarginal regions) among other functions compared to alcoholic women.

These findings appear online in the journal *PLOS One*.

Provided by Boston University School of Medicine

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