

Young binge drinkers show altered brain activity

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Researchers have studied the brain activity of young binge-drinking

college students in Spain, and found distinctive changes in brain activity, which may indicate delayed brain development and be an early sign of brain damage.

For many students, college involves a lot of socializing at parties and at bars, and alcohol is a common factor in these social environments. Excessive alcohol use, in the form of binge drinking, is extremely common among [college students](#), and one study has estimated that as many as one third of young North Americans and Europeans binge drink.

So, what defines binge drinking? The National Institute of Alcohol Abuse and Alcoholism describes a binge as drinking five or more drinks for men and four or more for women within a two-hour period, and for many college students, these limits wouldn't equate to a particularly heavy night. Previous research has linked binge drinking to a variety of negative consequences including neurocognitive deficits, poor academic performance, and risky sexual behavior.

While numerous studies have shown that the brains of chronic alcoholics have altered [brain activity](#), there is also evidence that bingeing can change adolescents' brains. Eduardo López-Caneda, of the University of Minho in Portugal, investigates this phenomenon.

"A number of studies have assessed the effects of binge drinking in young adults during different tasks involving cognitive processes such as attention or working memory," says López-Caneda. "However, there are hardly any studies assessing if the brains of binge drinkers show differences when they are at rest, and not focused on a task."

In a recent study published in *Frontiers in Behavioral Neuroscience*, López-Caneda and colleagues set out to see if the resting brains of [binge-drinking](#) college students showed any differences compared with those

of their non-bingeing counterparts.

The researchers recruited first year college students from a university in Spain, and asked them to complete a questionnaire about their drinking habits. Students that had participated in at least one binge within the previous month were considered to be binge drinkers, whereas non-bingers had never binged before. By attaching electrodes to the students' scalps, the scientists could assess electrical activity in various brain regions.

Compared with the non-bingers, the binge drinkers demonstrated altered brain activity at rest. They showed significantly higher measurements of specific electrophysiological parameters, known as beta and theta oscillations, in brain regions called the right temporal lobe and bilateral occipital cortex.

Surprisingly, previous studies have found very similar alterations in the brains of adult chronic alcoholics. While the young bingers in this study might occasionally consume alcohol to excess, they did not fit the criteria for alcoholism. So, what does this mean?

The changes might indicate a decreased ability to respond to external stimuli and potential difficulties in information processing capacity in young binge drinkers, and may represent some of the first signs of alcohol-induced [brain damage](#).

The brains of adolescents are still developing, meaning that they might be more vulnerable to the effects of [alcohol abuse](#). "These features might be down to the particularly harmful effects of alcohol on young brains that are still in development, perhaps by delaying neuromaturation processes," says López-Caneda.

The researchers stress that they need to carry out further studies to

confirm if the features they have observed in these young binge drinkers are caused by their bingeing, and if their [brain development](#) might be impaired. However, the results suggest that bingeing has tangible effects on the young [brain](#), comparable with some of those seen in chronic alcoholics. "It would be a positive outcome if educational and health institutions used these results to try to reduce [alcohol](#) consumption in risky drinkers," says López-Caneda.

More information: *Frontiers in Behavioral Neuroscience*, [DOI: 10.3389/fnbeh.2017.00168](#)

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