

OSU Research: How alcohol dampens response to uncertain stressors

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When drinking for stress relief, people may make risky decisions because the alcohol affects how much they worry about unknown or unpredictable stressors, new research from Oregon State University (OSU) shows.

For example, if someone is driving intoxicated but knows their entire route home by heart, they can respond to known stressors like a stop sign; but if another driver or pedestrian does something unexpected, the person's intoxication makes them less responsive to that new, unknown stressor.

"Drinking alcohol may make people care less about unpredictable things, and that's not necessarily a good thing," said Daniel Bradford, co-author on the study and an assistant professor in OSU's College of Liberal Arts. "When you're drinking you may make risky decisions because you don't worry about what you can't predict when you're drunk."

Bradford's psychology lab, established in fall 2021 at Oregon State, is studying the mechanisms of human response to stressors and how drug use can change those responses.

There's nothing inherently wrong with using substances to reduce your stress level, Bradford said.

"But if some people use a drug or alcohol to reduce their stress enough times and to enough extent, then some people will start to have what seems like a change in their physiology, where they tend to be more stressed than normal when they don't have that drug in their system," he said.

"Their physiology gets used to having that drug on board to reduce their stress, instead of the normal processes we have on board to reduce our stress, so over time, your body doesn't do those natural processes. It doesn't happen for everyone, but it is a big component of addiction for some people."

For the study, conducted at the University of Miami, researchers recruited 128 participants ages 21-35 with no history of alcohol problems and gave some of them cocktails with alcohol and some only a placebo. For the experiment, the group receiving alcohol had an average blood-alcohol content of 0.07%, just under the legal driving limit.

They tested participants' responses to different types of stressors by attaching electrodes to their fingers and delivering minor shocks — some with a specific warning about how strong the shock would be, and some with more vague information. None were enough to cause pain; the strongest shocks were roughly equivalent to what you'd get from a prank hand buzzer, Bradford said.

The study was preregistered, meaning that the researchers were clear from the start about what they planned to study, the methods they would use and the way they would process and analyze their data, and adhered to those methods throughout the process. Preregistration has become more of a mainstream concern in the past decade as a way to ensure ethical, transparent research practices.

The warnings came in the form of visual cues on a screen, where participants would see a gray box with either a question mark, a range of numbers or a specific number indicating the level of the upcoming shock. The shocks came six seconds following the warning.

While the severity of the shock had an effect on people's stress response — as measured by eye blinks and EEG readings of their heart rates — the uncertainty had the biggest impact.

"If you tell someone they're going to get a low shock or a high shock, or you say that it can't be any higher than 'X,' people still have a stronger physiological response when they don't know how big it's going to be, even when they know that it can't be any bigger than the biggest number you told them," Bradford said.

The experiment also tested how the controllability of a stressor affects the person's response to it, by sometimes giving participants the ability to reduce the upcoming shock by a few degrees. But the effect on stress response was minimal, the study found.

"In terms of size, I will honestly say none of these things are huge effects," Bradford said. "There are all kinds of other factors that are going to predict how much of an effect alcohol has, and further down the road, how much something matters in terms of risk for addiction. The big thing is that alcohol actually lowers your stress response to all of these types of stressors."

That said, he added, it's still important to determine which types of stressors are most important for which people.

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