Brain scans show that stressed out college students are more likely to abuse alcohol when they have both a strong desire for reward and little fear of the dangers.

"Imagine the push and pull of opposing drives when a mouse confronts a hunk of cheese in a trap. Too much drive for the cheese and too little fear of the trap leads to one dead mouse," says senior author Ahmad Hariri, a professor of psychology and neuroscience at Duke University and director of its Laboratory of NeuroGenetics. Hariri and lead author Yuliya S. Nikolova, a Duke graduate student, analyzed fMRI brain scan data to measure individual differences in the functioning of reward and threat circuits in the brains of the students

The students' self-reporting spanned the previous 12 months and included questions regarding their experience of stressful life events as well as their use of alcohol and any problems associated with this use.

In addition, a subset of students provided reports of their drinking three months after they were scanned, allowing Nikolova and Hariri to map differences in brain function onto later problem drinking. The authors found that problem drinking related to stress emerged only in students who had both a highly reactive reward circuitry in the ventral striatum region of the brain and a hypo-reactive threat circuitry in the amygdala. "The work further highlights a novel protective role for the amygdala, which has been historically the focus of risk for and pathophysiology of mood and anxiety disorders," Hariri says.

The findings may help with identifying individuals who are particularly high-risk for abusing alcohol because of stress, including biomarkers and interventions, Nikolova notes.

The authors says an important caveat to consider when interpreting their findings is that participants may have experienced more stressful life events partially as a result of their increased drinking, rather than the other way around. "This interpretation would be consistent with a heightened drive to pursue immediate rewards, coupled with a reduced ability to recognize and avoid threat in those individuals," they write in the study published in the open-access journal Biology of Mood & Anxiety Disorders. Source: Duke University.

To learn more about Underage and College Drinking, click here.