

Just made a bad decision? Perhaps anxiety is to blame

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Credit: public domain

Most people experience anxiety in their lives. For some, it is just a bad, passing feeling, but, for many, anxiety rules their day-to-day lives, even to the point of taking over the decisions they make.

Scientists at the University of Pittsburgh have discovered a mechanism for how [anxiety](#) may disrupt [decision making](#). In a study published in *The Journal of Neuroscience*, they report that anxiety disengages a region of the [brain](#) called the prefrontal cortex (PFC), which is critical for

flexible decision making. By monitoring the activity of neurons in the PFC while anxious rats had to make decisions about how to get a reward, the scientists made two observations. First, anxiety leads to bad decisions when there are conflicting distractors present. Second, [bad decisions](#) under anxiety involve numbing of PFC neurons.

The data indicates that anxiety has an exquisitely selective effect on neuronal activity that supports decision making, says Bitá Moghaddam, the lead author of the study and a professor in the Department of Neuroscience within the Kenneth P. Dietrich School of Arts and Sciences. Up to now, scientists have mostly studied anxiety in animal models in the context of fear and measured how [brain cells](#) react to a threatening situation. But human anxiety is devastating, not merely because of how the person feels, but also because it can interfere with nearly all aspects of daily life including decision making, Moghaddam says.

Pitt researchers studied this aspect of anxiety by monitoring the activity of a large number of neurons as rats made decisions about which choice was most optimal for receiving a reward. They compared behavior and [neuronal activity](#) in two groups: one group that had a placebo injection and another that got a low dose of an anxiety-inducing drug.

As with many people who suffer from anxiety but go through day-to-day life and make decisions, the anxious rats completed the decision-making task and, actually, did not do too badly. But they made far more mistakes when the correct choice involved ignoring distracting information. "A brain locus of vulnerability for these anxiety-induced mistakes was a group of cells in the PFC that specifically coded for choice. Anxiety weakened the coding power of these neurons.

"We have had a simplistic approach to studying and treating anxiety. We have equated it with fear and have mostly assumed that it over-engages

entire brain circuits. But this study shows that anxiety disengages brain cells in a highly specialized manner."

Perhaps, down the line, this better understanding of the brain mechanics behind anxiety and decision making, she says, could lead to better treatment of anxiety in people and, subsequently, better outcomes in the treatment of psychiatric disorders.

Provided by University of Pittsburgh

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