

Researchers study anxiety differences between females and males

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Feeling anxious about health, family or money is normal for most people—especially during the COVID-19 pandemic. But for those with

anxiety disorders, these everyday worries tend to heighten even when there is little or no reason to be concerned.

Researchers from Indiana University School of Medicine recently studied the behaviors associated with [anxiety](#)—published in *Psychopharmacology*—examining how [biological factors](#) impact [anxiety disorders](#), specifically in [females](#). They found that anxiety in females intensifies when there's a specific, life-relevant condition.

The team, led by Thatiane De Oliveira Sergio, Ph.D., postdoctoral fellow in the laboratory of Woody Hopf, Ph.D., professor of psychiatry and primary investigator at Stark Neurosciences Research Institute, studied male and female rodent models to better understand sex differences in biological responses related to anxiety.

Anxiety disorders occur in twice as often in women than men, and social and [cultural factors](#) likely play an important role in the development of anxiety in females, De Oliveira said.

The COVID-19 pandemic heavily influenced anxiety in people. According to the Centers for Disease Control and Prevention, in June 2020—a few months into the pandemic—13 percent of Americans started using or increasing substance use to cope with their emotions and stress due to the unknowns at that time about the pandemic.

Knowing that women have more incidence of anxiety than men, De Oliveira said the roles for many women have amplified during the pandemic—working remotely, teaching children in virtual school, everyday tasks, errands. She said these life-relevant conditions could have increased their anxiety.

"This work is giving us a foundation to start and explore anxiety behaviors that are very important and even more relevant now," De

Oliveira said.

While anxiety in humans is complex, anxiety in animals is based solely on biology.

"Biological factors play an important role in these types of mood disorders, but it can be hard to untangle the mechanisms that drive anxiety in humans," De Oliveira said. "This rodent work is important to do to help develop more effective and personalized treatments."

Through studying both male and female rodent models, they found that females and males were very different in their response to the most life-relevant aspects related to anxiety, Hopf said.

In one of the behavioral tasks, rodents had to grab pellets of food which were in the brightly lit center of a big arena. Rats don't like the light, so this creates an anxious conflict. In this task, female rats took longer to touch the food and ate less food relative to males.

The researchers also gave the rodents diazepam—a drug used to treat anxiety—and it greatly reduced anxiety in females, but it had little effect in males when interacting with food. There were also other measures that showed similarities between males and females, Hopf said, including how many times a rat approached the lit center and how long it remained there. Thus, only the parts of the task that were most life-relevant—in this case food—showed sex differences.

Previous studies support the idea that anxiety in females is focused on the most life-relevant aspects of a situation, Hopf said, which aligned with their findings. For example, females—more than males in both studies—showed greater responses to the urine of a predator and had higher anxiety when in the presence of a second rat that was free to wander around.

"Knowing that anxiety can manifest from different concerns in males and females, with females particularly attuned to the most life-relevant conditions, is a valuable step towards seeking better treatments based on sex differences," De Oliveira said.

More information: Thatiane De Oliveira Sergio et al, Sex differences in specific aspects of two animal tests of anxiety-like behavior, *Psychopharmacology* (2021). [DOI: 10.1007/s00213-021-05893-w](https://doi.org/10.1007/s00213-021-05893-w)

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