

Individuals with social phobia have too much serotonin—not too little

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Credit: George Hodan/Public Domain

Previous studies have led researchers to believe that individuals with social anxiety disorder/ social phobia have too low levels of the neurotransmitter serotonin. A new study carried out at Uppsala University, however, shows that the situation is exactly the opposite. Individuals with social phobia make too much serotonin. The more serotonin they produce, the more anxious they are in social situations.

Many people feel anxious if they have to speak in front of an audience or socialise with others. If the anxiety becomes a disability, it may mean that the person suffers from [social phobia](#) which is a psychiatric disorder.

Social phobia is commonly medicated using SSRI compounds. These change the amount of the neurotransmitter [serotonin](#) in the brain. Based on previous studies, it was believed that individuals with social phobia had too little serotonin and that SSRIs increased the amount of available serotonin. In a new study published in the scientific journal *JAMA Psychiatry*, researchers from the Department of Psychology at Uppsala University show that individuals with social phobia make too much serotonin.

The research team, led by professors Mats Fredrikson and Tomas Furmark, used a so-called PET camera and a special tracer to measure chemical signal transmission by serotonin in the brain. They found that patients with social phobia produced too much serotonin in a part of the brain's fear centre, the amygdala. The more serotonin produced, the more anxious the patients were in [social situations](#).

A nerve cell, which sends signals using serotonin, first releases serotonin into the space between the nerve cells. The nerve signal arises when serotonin attaches itself to the receptor cell. The serotonin is then released from the receptor and pumped back to the original cell.

"Not only did individuals with social phobia make more serotonin than people without such a disorder, they also pump back more serotonin. We were able to show this in another group of patients using a different tracer which itself measures the pump mechanism. We believe that this is an attempt to compensate for the excess serotonin active in transmitting signals", says Andreas Frick, a doctoral student at Uppsala University Department of Psychology.

This discovery is a major leap forward when it comes to identifying changes in the brain's chemical messengers in people who suffer from anxiety. Earlier research has shown that nerve activity in the amygdala is higher in people with social phobia and thus that the brain's fear centre is over-sensitive. The new findings indicate that a surplus of serotonin is part of the underlying reason.

"Serotonin can increase anxiety and not decrease it as was previously often assumed", says Andreas Frick.

Provided by Uppsala University

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