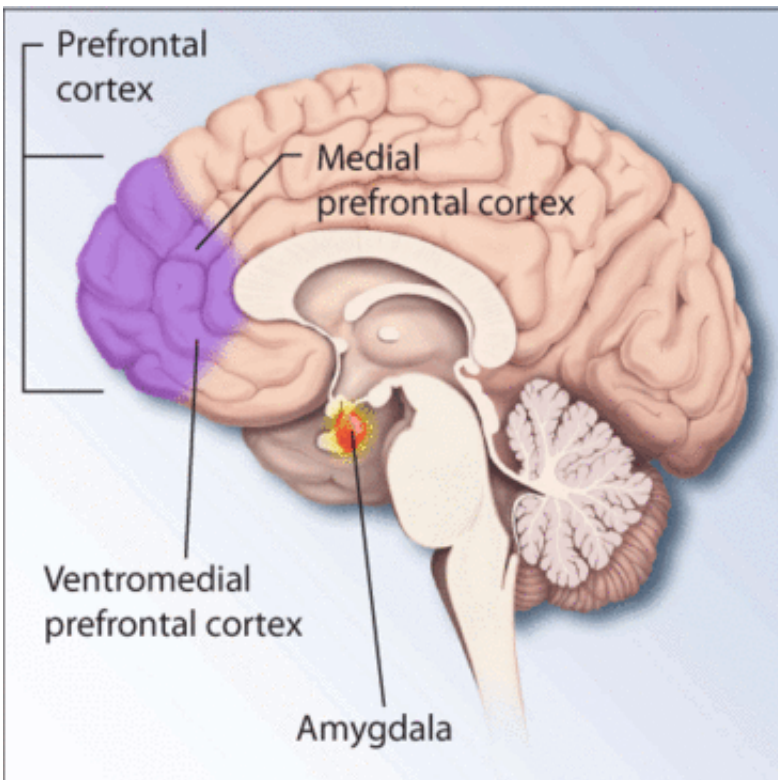


Game study not playing around with PTSD relief

May 26 2017, by Paul Mayne



Regions of the brain associated with stress and posttraumatic stress disorder.
Credit: National Institutes of Health

Post-traumatic stress disorder (PTSD) patients wrestling with one of its main symptoms may find long-term relief beyond medication thanks to the work of a Western researcher.

Psychiatry professor Dr. Ruth Lanius has been utilizing [brain](#)-training techniques through video games as a way of helping PTSD [patients](#) reduce the impact of hyperarousal and, therefore, restore their [brain activity](#) to normal levels. Conducted with the University of Geneva, the study, "Neurofeedback Tunes Scale-Free Dynamics in Spontaneous Brain Activity," was recently published in the journal *Cerebral Cortex*.

PTSD is a mental-health condition triggered by experiencing or witnessing a terrifying event. Symptoms may include flashbacks, nightmares and severe anxiety, as well as hyperarousal.

With hyperarousal, patients experience changes in physical and emotional reactions including being easily startled or frightened; always being on guard for danger; self-destructive behaviour, such as drinking too much or driving too fast; trouble sleeping; trouble concentrating; irritability, angry outbursts or aggressive behavior; and overwhelming guilt or shame.

"PTSD patients can feel high anxiety. It could be a certain noise or any sort of reminder of a traumatic incident," said Lanius, a scientist at Lawson Health Research Institute. "There will be stress; they will become tense; the heart starts beating faster; you may get chest pains."

Lanius targeted hyperarousal for her work, seeking a way of slowing its effects.

For her study, she utilized a brain-training technique called neurofeedback, a real-time display of brain activity to teach self-regulation of [brain function](#). This is done through a brain-computer interface that records brain signals through sensors on the scalp and projects them onto a screen.

"I've been doing a lot of work outlining what is happening in the brain of

those with PTSD," Lanius said. "There is evidence the way the [brain waves](#) fire were directly related to how the brain is activated. We thought, indirectly, by changing brain waves, we can change activation."

For the study, PTSD patients visualized their brain activity through a simple video game. The 30-minute game consisted of a spaceship on a starry background. When patients reduced their alpha rhythm – the brain's dominant brain wave – the space ship moved forward. The goal, Lanius stressed, was to keep the ship moving forward.

"Patients reported reducing the dominant brain wave by concentrating their attention towards the visuals on screen," she continued. "Through the game, they are figuring out something that works for them, on their own, and get immediate feedback through the game."

Previous research has suggested a brain's alpha rhythm is reduced with increased focus, hence why PTSD therapy oftentimes focuses on stress reduction, such as meditation, progressive relaxation, visual relaxation and journaling.

Neurofeedback like this has been used for other forms of psychiatric disorders, as well as by sports teams as a form of training.

These findings, however, are something Lanius hopes patients can use on their own as the study also found the reduction in alpha rhythm resulted in lasting changes.

After the initial reduction, the [alpha rhythm](#) rebounded to levels matching those found in healthy individuals. Patterns of brain activity were restored to a more proportional balance associated with healthy brain function.

Following the sessions, patients reported a continued decrease in

hyperarousal.

"This means existing mechanisms of the human brain may be harnessed for therapy, providing an alternative to pharmaceutical and brain stimulation therapies," she said.

Lanius and her collaborators are currently continuing this research with a larger group of PTSD patients who will complete multiple sessions of brain training to determine if the positive effects can be sustained long-term.

"Medication can help. Psychotherapy can help. And it looks like this is also a promising adjunct treatment," Lanius said. "It just gives us many tools that could really lead to personalized treatment."

More information: T. Ros et al. Neurofeedback Tunes Scale-Free Dynamics in Spontaneous Brain Activity, *Cerebral Cortex* (2016). [DOI: 10.1093/cercor/bhw285](https://doi.org/10.1093/cercor/bhw285)

Provided by University of Western Ontario

Citation: Game study not playing around with PTSD relief (2017, May 26) retrieved 10 April 2024 from <https://medicalxpress.com/news/2017-05-game-ptsd-relief.html>

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