

Brain training increases dopamine release

August 5 2011

It is known that training can improve working memory. In a new study in *Science*, researchers from Karolinska Institutet, Umeå University, Åbo Akademi University, and the University of Turku show for the first time that working-memory training is associated with an increased release of the neurotransmitter dopamine in specific brain regions.

"[Working-memory](#) training resulted in increased dopamine release in the caudate, a region located below the neocortex, in which the dopaminergic influx is particularly large", says Lars Bäckman, Professor at Karolinska Institutet, and one of the scientists behind the study. "This observation demonstrates the importance of dopamine for improving working-memory performance."

In the study, 10 young Finnish men were trained in updating working memory for five weeks by means of a letter-memory task. The participants were presented with 7 to 15 letters during 45 minutes three times per week on a screen that was turned off after presentation. The task was to remember the last four letters in the sequence in correct order. (The training programme can be found on-line, see link further down)

Compared to a control group that did not receive any training, the trained group showed a gradual improvement of working-memory performance. Results from a PET scan demonstrated an increased release of dopamine in the caudate after training. In addition, dopamine release was seen during the letter-memory task also before training; this release increased markedly after training.

Further, improvements after training were demonstrated in an untrained task that also requires updating.

"These findings suggest that the [training](#) improved working memory generally", says Professor Lars Nyberg at Umeå University.

Provided by Karolinska Institutet

Citation: Brain training increases dopamine release (2011, August 5) retrieved 6 May 2024 from <https://medicalxpress.com/news/2011-08-brain-dopamine.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.