

Aging brains allow negative memories to fade

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It turns out there's a scientific reason why older people tend to see the past through rose-coloured glasses.

A University of Alberta medical researcher, in collaboration with colleagues at Duke University, identified brain activity that causes older adults to remember fewer negative events than their younger counterparts.

"Seniors actually use their brain differently than younger people when it comes to storing memory, especially if that memory is a negative one," said study author Dr. Florin Dolcos, an assistant professor of psychiatry and neuroscience in the Faculty of Medicine & Dentistry.

The study, published online in December in the U.S.-based journal *Psychological Science*, found age-related changes in brain activity when participants with an average age of 70 were shown standardized images that depicted either neutral or strongly negative events.

The research team asked older and younger participants to rate the emotional content of these pictures along a pleasantness scale, while their brain activity was monitored with a functional magnetic resonance imaging (fMRI) machine, a high-tech device that uses a large magnet to take pictures inside the brain. Thirty minutes later, participants were unexpectedly asked to recall these images. The older participants remembered fewer negative images than the younger participants.

Brain scans showed that although both groups had similar activity levels in the emotional centres of the brain, they differed when it came to how these centres interacted with the rest of the brain.

The older participants had reduced interactions between the amygdala, a brain region that detects emotions, and the hippocampus, a brain region

involved in learning and memory, when shown negative images. Scans also showed that older participants had increased interactions between the amygdala and the dorsolateral frontal cortex, a brain region involved in higher thinking processes, like controlling emotions. The older participants were using thinking rather than feeling processes to store these emotional memories.

Dr. Dolcos conducted the study in collaboration with senior researcher Dr. Roberto Cabeza and graduate student Ms. Peggy St. Jacques, both of Duke University.

In another article published earlier this year in the journal *Neurobiology of Aging*, the team reported that healthy seniors are able to regulate emotion better than younger people, so they are less affected by upsetting events. They also conducted further research to look at the relationship between emotion, memory and aging.

"Seniors' brains actually work differently than younger individuals – they have somehow trained their brain so that they're less affected both during and after an upsetting event," said Dolcos, a member of the Alberta Cognitive Neuroscience Group, a University of Alberta research team that explores how the brain works in human thought, including issues like perception, memory and emotion.

This research may improve understanding of mental health issues like depression and anxiety, where patients have trouble coping with emotionally challenging situations, and suffer from intrusive recollection of upsetting memories. These findings may also help to enhance memory in older adults with memory deficits, and assist with research related to dementia, including Alzheimer's disease, in which patients have difficulty with remembering personal events.

Source: University of Alberta

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