

## Strength Training Boosts Memory in a Single Session

Pam Harrison | October 10, 2014

A single, brief session of resistance exercise done immediately after a visual learning task enhances episodic memory by about 10%, new research shows.

Lisa Weinberg, a psychology graduate student at the Georgia Institute of Technology, in Atlanta, and colleagues found that a resistance workout lasting as little as 20 minutes improved recall of a series of photos shown to participants 48 hours earlier.

"Our study indicates that people don't have to dedicate large amounts of time to give their brain a boost," Weinberg said in a statement.

"We're not trying to replace long-term [aerobic] interventions — they are great and do all sorts of amazing things for you," coinvestigator Audrey Duarte, PhD, Georgia Institute of Technology, told *Medscape Medical News*.

"But what hasn't been shown before is that the benefit we are seeing occurs after doing a really easy task that anyone could do at home when injured or even after a hip replacement. Since we are studying aging in my lab, I find this particularly compelling because of its application to aging."

The study was published in the October issue of *Acta Psychologica*.

The study began with a total of 46 participants who looked at a series of 90 photos on a computer screen. Images were evenly split between positive images, such as children on a water slide; negative images, such as mutilated bodies; and neutral images, such as pictures of clocks.

Everyone then sat down at a leg extension resistance exercise machine, but only half of the group were asked to use the machine by extending and contracting each leg at their personal maximum effort of 50 times.

The other half just sat in the chair and let the machine or the researchers move their legs.

During the session, blood pressure, heart rate, and levels of markers linked to stress were measured in both groups.

Forty-eight hours later, participants returned to the laboratory and were exposed to the same 90 images that they were exposed to during the first session, as well as 90 new images.

All participants remembered positive and negative images better than neutral images ( $P < .001$ ), and there was no difference in recognition rates between positive and negative images.

However, when participants were distinguished on the basis of high or low response to resistance testing, those with the highest physiologic responses did not do as well recognizing neutral items as the individuals who were classified as low responders to the same intervention.

"These results are consistent with the theory that acute stress during consolidation can be beneficial to memory for emotional but not neutral information," the researchers write.

Other research has linked enhancement of memory to acute stress responses, usually psychological stress, such as public speaking.

Studies have also linked the release of specific hormones and norepinephrine in rodent brains to better memory.

"Even without doing expensive functional MRI scans, our results give us an idea of what areas of the brain might be supporting these exercise-induced memory benefits," study coinvestigator Audrey Duarte, PhD, said in a statement.

"And findings are encouraging because they are consistent with rodent literature that pinpoints exactly the parts of the brain that play a role in stress-induced memory benefits caused by exercise," she added.

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