

Improving Brain Processing Speed Helps Memory

ScienceDaily (Feb. 11, 2009) — Mayo Clinic researchers found that healthy, older adults who participated in a computer-based training program to improve the speed and accuracy of brain processing showed twice the improvement in certain aspects of memory, compared to a control group.

"What's unique in this study is that brain-processing activities seemed to help aspects of memory that were not directly exercised by the program -- a new finding in memory research," says Glenn Smith, Ph.D., Mayo Clinic neuropsychologist and lead researcher on the study.

The research, a controlled, multisite, double-blind study, will be published in the April issue of the Journal of the American Geriatrics Society. A copy is available online Feb. 9, 2009.

For an hour a day, five days a week for eight weeks, study participants worked on computer-based activities in their homes. The participants, from Minnesota and California, were age 65 or older. No one had a diagnosis of cognitive impairment, such as early Alzheimer's disease.

The control group, with 245 adults, watched educational videos on art, history and literature topics. They completed quizzes on the content.

The experimental therapy group, with 242 adults, completed six auditory exercises designed to help the brain improve the speed and accuracy of processing. For example, participants were asked to distinguish between high- and low-pitched sounds. To start, the sounds were slow and distinct. Gradually, the speed increased and separation disappeared.

"The sounds go faster and faster, until it ends up sounding almost like a click," says Dr. Smith. The difficulty increases only as participants master each step with 85 percent accuracy. Other exercises, such as matching or distinguishing between similar-sounding words, for example, pop and pot, also were part of the skill building.

The commercially available program was developed by Posit Science, San Francisco company that financed the research. Mayo Clinic researchers do not have financial ties to this business.

At the end of eight weeks, researchers used a standardized tool to measure participants' memory changes. Called the Repeatable Battery for the Assessment of Neuropsychological Status, it includes tasks such as repeating words or numbers after hearing them once.

"We found that the improvement in these skills was significantly greater in the experimental group -- about double," says Dr. Smith.

Participants in the experimental group self-reported memory improvement, too, indicating the change was noticeable in day-to-day tasks.

While the study results are statistically significant, Dr. Smith says it is important to understand the extent of the memory boost. Collectively, the experimental group's memory function increased about 4 percent over the baseline measured at the study's onset. The control group's overall memory gain was about 2 percent.

But, Dr. Smith says, because participants were in generally good health, the results don't offer insights on preventing Alzheimer's or other forms of dementia.

Results indicate that aging adults may be able to make better-informed decisions about ways to improve memory. "Brain processing speed slows as we age," says Dr. Smith. "The study indicates that choosing a memory-enhancing approach that focuses on improving brain processing speed and accuracy, rather than memory retention, may be helpful."

There's no harm in trying other approaches -- mnemonics, workshops or even doing crosswords or playing piano, he says, but there's little evidence these methods sustain benefits in memory.

Other researchers involved in this study include: Patricia Housen, Ph.D., and Elizabeth Zelinski, Ph.D., both with Leonard Davis School of Gerontology, University of Southern California, Los Angeles; Kristine Yaffe, M.D., University of California, San Francisco; Ronald Ruff, Ph.D., Stanford University, Stanford, Calif.; Robert Kennison, Ph.D., California State University, Los Angeles; and Henry Mahncke, Ph.D., Posit Science Corporation, San Francisco. His affiliation with this company is noted in the journal article.