

# Simple Brain Training Techniques Can Turn You Into a Memory Master

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February 22, 2024

## STORY AT-A-GLANCE

- › A technique called Memory Palace, or Method of Loci, can help you improve your short-term recall by engaging your spatial and visual memory to memorize lists, items, names and numbers
- › Research shows anyone can become a memory master using these kinds of techniques, which improve recall by boosting communication between the memory center and the visual and spatial centers in your brain
- › Other strategies that can help improve your memory include other mnemonic devices, learning a new language, meditation, certain music and smells, laughter, exercise and various brain-training programs, games and puzzles

***Editor's Note: This article is a reprint. It was originally published March 23, 2017.***

How's your memory these days? If you're like most, you could probably use some help in this area. Your memory holds a record of your entire life and helps shape your identity, but the ability to form memories does not occur until around the age of 5.

In the video above, two-time world memory champion Alex Mullen and fellow medical student Cathy Chen explain a memorization system called Memory Palace, also known as Method of Loci,<sup>1</sup> which can help you improve your short-term recall.

The process involves using a space or location you're familiar with to memorize unfamiliar or new things. The reason it works so well is because most people have very

good spatial and visual memory.

As noted by Chen, "Visualizing an image makes it way more memorable and interesting to your brain than, say, random names or numbers."

As an example, Chen and Mullen explain how you might memorize items on your grocery shopping list. You probably know your dining room really well, so to memorize "eggs" on your list, mentally travel into your dining room, look at a bowl of, say, fruit, and imagine a hen has laid eggs in your fruit bowl.

Then, when you're in the store, you can mentally travel around the space (your dining room), recall the bowl of fruit – and the funny image of eggs laid in the bowl. Another example: Imagine toothpaste smeared all over your placemats. When you recall the placemats, you automatically remember the item on your list, namely the toothpaste.

## **You Too Can Become a Memory Master**

According to research,<sup>2,3,4</sup> anyone can become a memory master by training their brain using these kinds of techniques. In fact, people who had never used memory techniques prior to the study were able to master it, and in just six weeks, their brains began resembling those of the world's top-ranked memory masters.

The study also confirmed what Chen and Mullen say – that the memory centers in memory masters' brains communicate very strongly with their visual and spatial centers, and this appears to be a key to their impressive feats of memorization. As noted by CNN:<sup>5</sup>

*"[Researcher Boris Nikolai] Konrad said this is because of how memory athletes train: by picturing familiar places and filling them with imaginary objects, like a cow eating moss to represent the city of Moscow."*

Essentially, what you're doing is improving and expanding the connectivity between different centers in your brain. You're not altering the actual structure.

Compared to using a technique like Memory Palace, memory training involving repetition showed only minor gains in recall. They also didn't improve the connectivity in their brain, which was evaluated using brain scans. If you want to try it out or learn more about Memory Palace, visit [MemoCamp.com](https://www.memo-camp.com).<sup>6</sup>

Other mnemonic devices – tools to help you remember words, information or concepts – include using:

- **Acronyms** (such as PUG for "pick up grapes")
- **Visualizations** (such as imagining a tooth to remember you have a dentist's appointment)
- **Rhymes** (if you need to remember a name, for instance, think "Shirley's hair is curly")
- **Chunking**, which is breaking up information into smaller "chunks" (such as organizing numbers into the format of a phone number)

## **Other Activities That Help Improve Memory and Keep Your Brain Sharp**

Advances in brain research have revealed the human brain has remarkable plasticity, or the ability to regenerate and form new connections throughout your life.

"Use it or lose it" applies here, and previous research<sup>7</sup> has shown engaging in stimulating social activities, artistic pursuits and crafts such as knitting or quilting<sup>8</sup> help keep your mind sharper with age and prevent cognitive decline. As reported in the Journal of Psychosocial Nursing and Mental Health Services:<sup>9</sup>

*"Chess and bridge are leisure activities that demand working memory and reasoning skills. Older adults who play bridge score higher on working memory and reasoning measures compared to non-players and working crossword puzzles has also been associated with maintained cognition in older adults."*

Other helpful pastimes include the following:

- **Learn a new language** — Language lessons have been shown to provide a beneficial brain workout and increase neuronal connections<sup>10</sup>
- **Meditate** — While it may seem you're not doing much of anything in terms of challenging your brain when meditating, research shows it alters the structure of your brain for the better and has a number of neurological benefits, including improved attention and concentration<sup>11</sup>
- **Listen to Mozart** — It's long been theorized that listening to music may boost your brainpower; you've probably heard of the "Mozart Effect," which suggests listening to classical music can help make you smarter.

Indeed, research<sup>12</sup> shows people who listen to Mozart's classical music have an increase in brain wave activity linked to memory, understanding and problem solving. Interestingly, music composed by Beethoven showed no such effect.

According to the researchers:<sup>13</sup> "These results may be representative of the fact that Mozart's music is able to activate neuronal cortical circuits (circuits of nerve cells in the brain) related to attentive and cognitive functions"

- **Sniff rosemary oil** — Engaging your olfactory senses may also have an effect on memory. Smells get routed through your olfactory bulb, the smell-analyzing region in your brain, which is closely connected to your amygdala and hippocampus, brain regions that handle memory and emotion.

One study<sup>14</sup> found people who sniffed rosemary essential oil performed better on memory tasks than those who did not. The aroma of peppermint has also been shown to enhance memory and increase alertness.

Indeed, research shows that odors are especially effective as reminders of past experience, much more so than cues from other senses, such as sights or sounds<sup>15</sup>

- **Laugh it up** — Laughter has been shown to improve memory by reducing levels of the stress hormone cortisol.<sup>16</sup> As explained by study co-author Lee Berk, doctor of public health:

*"It's simple, the less stress you have the better your memory. Humor reduces detrimental stress hormones like cortisol that decrease memory hippocampal neurons, lowers your blood pressure, and increases blood flow and your mood state ..."*

*There are even changes in brain wave activity towards what's called the gamma wave band frequency, which also amp up memory and recall. So, indeed, laughter is turning out to be not only a good medicine, but also a memory enhancer ..."*

## Sources to Add to Your Brain Training Arsenal

If you're not quite ready to take up a foreign language, piano lessons or knitting, you may still be able to bolster the growth of new brain cells and neural connections by challenging your mind with various games and puzzles. Here are a few resources you can try:

- **Lumosity**<sup>17</sup> – This brain-training app provides personalized brain workouts using more than 50 different cognitive games designed to boost memory, attention, problem solving and more.
- **Brain HQ**<sup>18</sup> – Developed by Michael Merzenich, Ph.D., professor emeritus at the University of California, who has pioneered research in brain plasticity (neuroplasticity) for more than 30 years, Brain HQ is a computer-based brain-training program that can help you sharpen a range of skills, from reading and comprehension to improved memorization and more.

Like Lumosity, the website allows you to track and monitor your progress over time. While there are many similar websites, Brain HQ is one of the oldest and most widely used.

- **Iota** – Iota<sup>19</sup> is a card game involving placing cards in grids according to simple rules that require complex moves and strategic thinking on your part. This game must be played with at least one other person, so it makes for a fun social activity

while also improving spatial relation skills, visual discrimination and strategic thinking.

- **The Puzzle book** — Nancy Linde's "399 Games, Puzzles and Trivia Challenges"<sup>20</sup> is a popular book with games designed to improve neurogenesis, or the formation of new brain cells. Each puzzle is designed to get your brain thinking in new ways and targets cognitive functions such as logical thought, language and attention.

## **Physical Exercise Also Boosts Cognitive Functions and Memory**

Last, but certainly not least, no article on improving memory would be complete without at least a brief mention of physical exercise. As noted by psychiatrist Dr. John J. Ratey, author of "Spark: The Revolutionary New Science of Exercise and the Brain," there's overwhelming evidence that exercise produces large cognitive gains and helps fight dementia.

For example, studies show those who exercise have a greater volume of gray matter in the hippocampal region, which is important for memory.<sup>21,22</sup> Exercise also prevents age-related shrinkage of your brain,<sup>23</sup> preserving both gray and white matter in your frontal, temporal and parietal cortexes, thereby preventing cognitive deterioration.<sup>24,25</sup>

One of the mechanisms by which your brain benefits from physical exercise is via a protein called brain derived neurotrophic factor (BDNF). Exercise initially stimulates the production of a protein called FNDC5, which in turn triggers the production of BDNF, which is a remarkable rejuvenator. In your brain, BDNF preserves existing brain cells<sup>26</sup> and activates brain stem cells to convert into new neurons, effectively making your brain grow larger.

Another mechanism at play here relates to a substance called  $\beta$ -hydroxybutyrate, which your liver produces when your metabolism is optimized to burn fat as fuel.<sup>27</sup> Your brain can use both glucose and fat for fuel, but the latter is preferred. When glucose is depleted from exercise, your hippocampus switches over to use fat as a source of

energy, and it is this fuel switchover that triggers the release of BDNF and subsequent cognitive improvement.

When your blood sugar level declines,  $\beta$ -hydroxybutyrate serves as an alternative source of energy. That said,  $\beta$ -hydroxybutyrate also blocks histone enzymes that inhibit the production of BDNF. So, it seems your body is designed to improve BDNF production via a number of different pathways in response to physical exercise.

Interestingly, research also shows that exercising four hours after learning something new helps you retain what you've just learned long-term.<sup>28,29</sup> The same effect was not found when the exercise was done immediately after learning.

Why this four-hour delay boosted memory retention is still unclear, but it appears to have something to do with the release of catecholamines, such as dopamine and norepinephrine – naturally occurring chemicals in your body known to improve memory consolidation. One way to boost these catecholamines is through exercise, and apparently delayed exercise is part of the equation.

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