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## Pumping Neurons

Web Sites Say Mental Gymnastics Can Boost Your Brainpower. Experts Say They Need to Think About It Some More.

By Stacy Weiner  
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Most of the time I'm fine. But some days I can't find the car keys. And I can't recall the name of the nice lady who lives two houses down. And I wonder if next time I will be able to stop my car fast enough to avoid a thrill-seeking squirrel. And sometimes even simple, two-syllable words stick in my mouth like peanut butter.

Yet, ironically, I can remember quite well the fact that as we age, some of the connections between our neurons begin to deteriorate. And if, like me, you are among the country's 78 million baby boomers, you might try wrapping your brain around this: At about age 30, our gray matter starts shrinking, and the downhill process accelerates at 60 or so.

Not to worry, say creators of Internet-based "mental gymnasiums": Their online mind games can pump up your memory, reflexes, attention span and more.

In fact, online players -- there are thousands of them, according to the gym operators -- claim they have become less clumsy, more articulate and generally sharper since starting to work out with the sites' various exercises.

For many years, scientists adhered to the old dog/new trick notion. But recent research shows that the brain remains plastic, or basically trainable, throughout life. In a study published in the Journal of the American Medical Association in 2002, significant percentages of the 2,802 participants age 65 and older who trained for five weeks for about 2 1/2 hours per week improved their memory, reasoning and information-processing speed.

When we learn, we create physical changes inside our heads. By practicing a skill, we repeatedly stimulate the same area of the brain, which strengthens existing neural connections and creates new ones. Over time, we can become more cognitively efficient, using fewer neurons to do the same job. And the more often we fire up certain mental circuits, the easier it is to get them going again.

If I wanted to limber up my neurons, doing so online seemed a good idea -- it required no special game-playing equipment, for example -- so I set out to test a few brain-training sites. Because little fully independent, gold-standard scientific assessment of such sites exists, I entered with some skepticism.

"The consumer has to really be aware when they go to the different sites," says George Rebok, a Johns Hopkins professor and a contributor to the 2002 JAMA study. "Some of the exercises may have empirical science backing them up, but a lot of them may not."

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## **MyBrainTrainer.com**

I started my tour of three of the bigger online workout sites at <http://mybraintrainer.com/>, which boasts 6,000 subscribers. Launched in 2002, much of the site is the brainchild of Josh Reynolds, inventor of . . . the Thighmaster. Lest you strain a credulity muscle, note that an unpublished study found a significant increase in IQ among people who trained on the program's exercises for a month, according to MyBrainTrainer.

I clicked on the site. Did I want improved function and speed in 10 to 20 minutes per day after as few as 21 days? That was a no-brainer, so I got started with the free brain power test. My task: to respond, as quickly as possible, by hitting the right arrow key when a word-and-picture pair matched, the left arrow key when it did not. When the word "reversal" accompanied a pair, I was to switch my arrow selection.

The test was a breeze compared with the site's complex scoring reports. When I finally understood my score, I discovered that I was only a hair above average. But for \$9.95 I could spend four months on the site trying to improve my brain power. Yes! I wanted that!

Pretty soon, though, I found MyBrainTrainer's emphasis on speed and on comparing my mental muscle to other members' a bit of a brain drain. I did enjoy some of the site's niftier gadgets, including a message board for sharing workout tips and a BrainDiary, in which I could track my scores before and after such mind-altering influences as, say, sleep.

Overall, I felt a smidge sharper after spending an hour on the site, but could such exercises really make a difference?

Timothy Salthouse, a University of Virginia psychology professor, has his doubts. Unlike many of his colleagues, Salthouse isn't wowed by the latest research on mental exercise, whether practiced online or off.

"The ideal way to establish a cause-effect relationship in science is to randomly assign people to different groups," he explains. "One group receives the 'active ingredient' -- say, exercising on MyBrainTrainer -- and the other doesn't." The problem is that it's not feasible to randomly assign people to a mental lifestyle for decades, he argues; as a result, researchers are unable to deliver a definitive assessment of the long-term effects of brain training on the rate of mental decline.

Still, he adds, "I'd like people not to take away a completely negative message. My major point is that the evidence isn't conclusive yet. It may turn out in the future that mental exercise does have positive effects. So if you enjoy it while you're doing it, then still do it."

## **Happy-Neuron.com**

In the name of science, I set off in search of enjoyment, and <http://www.happy-neuron.com/> seemed a logical choice. I certainly was happy that I could play gratis for a week. (After that, the price is \$9.95 per month or \$99.95 per year.)

This site was started three years ago in France by a neurologist, a cognitive psychologist and a computer scientist; it recently moved to the United States, where it is undergoing changes, including efforts to quantify its effectiveness.

The suite of games includes those designed to build visual memory, auditory processing (by matching

birdcalls with bird photos), attention to detail, language skill and more. My favorite Happy Neuron game involved remembering several words and their positions on a grid. In a bit of pregame advice, the site suggested that I associate pairs of words -- if "car" appeared above the word "tulip," I might think, "The car ran over the tulip" -- which seemed like a trick I could apply in real life. Combos such as "superman" and "silverside" hardly lent themselves to that tip, however.

Other differences between the sites were apparent, too. MyBrainTrainer, with its many flashing lights, felt like a high-tech psych lab, while Happy Neuron, with its variety of games based on codes, basketball games and haiku-like word clusters, seemed more like a high-brow Funland.

Was one kind of exercise a better brain boost than others?

Rebok, a strong proponent of mental exercise, notes that certain exercises, such as those for visual acuity, may help a driver detect that darting squirrel more quickly. Others, such as memory challenges, probably will work well only if one consciously strives to apply them to real-life situations. And still others might not be particularly useful at all, says Rebok, who serves as a consultant to the Practical Memory Institute, which sells memory-training products.

Overall, though, Rebok notes the positives of working out on the Web: Interactivity may ramp up motivation, and bulletin board exchanges provide a social component that, offline at least, has been shown to aid memory training. Plus, he says, "If you're interacting with a site, rather than being more passive just sitting down with a crossword puzzle, you just may be forced to think a little harder."

### **BrainBuilder.com**

My final stop on the brain train: <http://www.brainbuilder.com/>, where, for \$7.95 a month, I could join the 7,000 mental athletes who have signed up since the site's launch in 2004.

After registering for the seven-day free trial, I found a gym sporting lovely sky-blue decor and, in some areas, cheery music. At this site, I would target my auditory and visual sequential processing.

Translation: I would see or hear a series of letters or numbers, try to remember it and then type it in the same or reverse order. There was a section on focus, too, but it was less central to the system.

BrainBuilder.com says I should see results in 90 days or sooner. But there were not many different activities, and I feared that the monotony would suck away my motivation long before those three months were up.

Alex Doman, who heads the site, explains the narrow approach. Decades ago, psychologist George Miller devised the concept that most adults can recall a series of seven digits, plus or minus two. Leaders at Doman's company reviewed the related literature, he says, and found that those with higher "digit-span memories" performed better on cognitive tests than those with lower spans.

Of course, a correlation like this does not prove causation, points out Larry Squire, a neuroscientist who studies memory at the University of California at San Diego School of Medicine.

"The backwards part is interesting, though," he adds. "We know that the ability to repeat digits backwards involves some of the higher, more evolved parts of the brain that are connected to aging." What's more, he

says, any challenging memorization effort, especially if accompanied by "conscious and effortful strategies," is good for brain health.

Still, says Squire, if you want solid science, your best bet might be to limber up more than just your typing fingers, since the most compelling research supports physical exercise as a brain booster.

Meanwhile, lots of mind-gamers are committed to their online workouts.

Rod Evans, a 50-year-old adjunct philosophy professor at Old Dominion University in Norfolk, says his teaching has definitely improved in the two years since he became a MyBrainTrainer devotee.

"I think I've become mentally sharper, and when I'm driving my car, I'm more aware as well," he says. Evans, who tries to hit the mental gym every day, also finds the challenge immensely enjoyable.

"When I get up in the morning and do this, I feel more alert. It's a way of waking my brain up," he says. "It gets my day going."

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