Can video games make our brains smarter, younger and sharper?

by Jonathan Sidener

The game begins with a static image of meadow grass and wildflowers that fills most of the computer screen. The image of a small bird briefly flashes on the left side of the meadow. At the same time, a letter appears elsewhere on the screen. And then both disappear.

Players have to simultaneously click on the spot where the bird appeared and remember the letter. The better they perform, the more difficult the game gets.

"Birdwatching" on the Lumos Labs Web site (www.LumosLabs.com) will never be mistaken for hard-core games such as "Halo," "Call of Duty" or "Grand Theft Auto," but there's a good chance it will sharpen players' minds.

A slew of games popping up on Web sites and retailer shelves target consumers seeking a mental boost, not adrenaline. The sudden wealth of mental-workout games is in part a result of recent neuroscience research that has matured and is ready to leave the laboratory.

Most of the interactive brain regimens are based on exercises that have shown an ability to improve mental functions in the laboratory. Those exercises then get wrapped in a more entertaining user interface and moved out of the lab.

The founders of the Lumos Labs site, for example, include a neuroscience researcher and a game designer. The company cites tests of its games concluding that participants improved memory, attention, mental processing speed and cognitive control.

Free beta test versions of the company's games are available on the site.

A second major factor in the current crop of brain games is the success that Nintendo's "Brain Age" enjoyed last year. The best-selling game, available only for the Nintendo DS handheld gaming system, measured "brain age" and then provided exercises to help players make their brains "younger."

A third factor is the aging of the baby boomers, who have always declined to act their age.

KNOW WAY - Can video games make us smarter? CNS Illustration by Jacie Landeros.

"This is a generation that has exercised more than any other before, and now we're getting older," said Sherlye Bolton, chief executive of brain-training site Happy Neuron (www.happyneuron.com). "That's a huge impetus toward the trend of exercising the brain. We've watched our parents age, but we've been different from our parents at every age. Why would we stop now?"

Others in the flood of smart games include "Brain Trainer" (www.braintrainer.com), "Mind Habits" (www.mindhabits.com) "BrainBuilder" (www.brainbuilder.com) and "Vigorous Mind" (www.vigorousmind.com). Three other games have been published for the Nintendo DS - "Big Brain Academy," "Brain Boost: Beta Wave" and "Brain Boost: Gamma Wave." Publisher Ubisoft created "Mind Quiz" for Sony's PlayStation Portable.

Even the AARP has gotten in on the act with a page on its Web site titled "Sharpen Your Brain With Daily Games and Puzzles" (www.aarp.org/fun).

In "Brain Age," players take an initial series of tests to determine their brain ages. Then they solve simple math problems as quickly as possible, draw bulldozers and firetrucks from memory, read aloud and complete other tasks. When they're ready, they can measure their brain age again to see if they've improved.

"Brain Age" is based on the work of Japanese neuroscientist and writer Ryuta Kawashima. According to Kawashima, younger brains show more activity in an area called the prefrontal cortex. Activities such as reading aloud, drawing pictures from memory and solving math problems stimulate that area of the brain, keeping the brain young, the researcher said.

Promising lab results don't always translate into real-world improvements. Many researchers say it's too early to know whether the games improve mental functioning. Others have begun studies to answer that question, including at least one looking at "Brain Age" players.

Nintendo steers clear of the scientific debate, making no claim of neurological benefits from the game. Its official position is that it's an entertainment company and that it produced a fun game.

Sales figures indicate that if nothing else, "Brain Age" is fun. The company sold 1.1 million copies in the United States last year, making the game one of the top 10 sellers for the year, according to the NPD group.

While Nintendo makes no claims, Bolton and others aren't so shy.

KEEPING SHARP

Bolton said properly designed games can improve mental function. To keep the brain sharp, people need engaging mental activities along with physical exercise and proper nutrition, she said.

Bolton said there's a large body of evidence that people who engage in challenging, interactive activities stay mentally healthier than those who don't.

She cited the National Institutes of Health's Advanced Cognitive Training for Independent and Vital Elderly study, which found long-lasting, positive effects from brief cognitive training in older adults.

One of the researchers for that study, University of Florida associate clinical psychology professor Michael Marsiske, said there is evidence that brain games improve performance on the specific tasks that are practiced.

The question of whether the improvements transfer to a broader brain fitness or "real-world functioning" remains to be answered, he said.

Brain games are one way, but not the only way, to make the mind run at highway speed, which fosters the growth of new neural cells, Bolton said.

Ballroom dancing and real-world games such as chess can do the same thing.

"Happy Neuron is not a magic bullet," she said. "Many people prefer to exercise outside, but sometimes it's raining or it's not convenient. So you go to the gym. Happy Neuron is like a gym for your brain."

Bolton previously was chairman and CEO of Scientific Learning, a company that develops neuroscience-based software to help children learn to read. Happy Neuron was formed to apply similar research to adult brains. The company's games include many word and letter puzzles. Players can reconnect words chopped into fragments, match words and definitions, and replace missing words in prose.

"The skills you need to read are the same skills that decline with age," Bolton said.

Not all of the brain workouts are riding on the coattails of "Brain Age." The Web site MyBrainTrainer was developed in 2002. Founder Bruce Friedman said there's little question that brain exercise sharpens minds. Even mainstream games with no foundation in neuroscience can have a positive effect, he said.

"There was a recent article in The Journal of The American Medical Association that found surgeons who play video games outperform surgeons who don't play video games," Friedman said.

Tests of MyBrainTrainer users show that daily training produces a measurable "cognitive buzz."

Friedman said that despite being in the arena first, he doesn't begrudge "Brain Age" for all the credit it gets. The publicity has been good for all brain games, he said.

Baby boomers, who "have always lived on the cutting edge of self-improvement," are eager consumers of brain training, Friedman said. But it's hard to say that earlier generations wouldn't have been interested, he said, adding, "They didn't have the scientific tools available to them."

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