

Restore youthful mental vigor

Fitness programs that keep the brain in shape

By MELISSA HEALY
Los Angeles Times

Ask anyone who's forgotten the name of a longtime co-worker, re-read a paragraph four times before absorbing its content or hit the brakes too slowly to avert a fender-bender: When the mental strength and agility of youth start to slip, the wisdom of age tells you something.

You want it back.

If a method of preserving or restoring that youthful mental vigor were safe, inexpensive and as simple and diverting as playing a video game for a short while each day, wisdom also would tell you to do it.

That calculation is why mental fitness programs have become the latest frontier in the nation's quest to age without conceding to infirmity.

The programs vary in format and cost, including online programs that cost \$10 per month, hand-held games that can cost \$140 and software packages priced at about \$400. Special touch-screen consoles designed for a community's use or specialized programs for people with conditions such as attention deficit can cost several thousand dollars.

In the past three years, these brainpower-boosting programs have proliferated, with names like MindFit, Happy Neuron, Brain Fitness and Lumosity. Americans this year are expected to invest \$225 million in these programs — up from \$70 million in 2003 — in an effort to tune up the brain, strengthen the memory and forestall or reverse the cognitive slippage that often comes with age, psychiatric disease, stroke or medical treatments.

But when an industry springs up so quickly, and makes claims so sweeping and seduc-

tive, the wisdom and experience of age should tell you one more thing: Ask for evidence and expect hype.

"There is plausibility, both biological and behavioral, to the claim that these may work," says Molly Wagster, chief of the National Institute on Aging's neuropsychology branch. "But it is still a situation of 'buyer beware.'"

Insurance companies such as Humana and Penn Treaty American Corp. have begun to distribute software programs such as Posit Science's Brain Fitness 2.0 to millions of their

wide. Retirement communities are rushing to establish brain gyms to help current residents sharpen their mental skills and to attract baby boomers, who one day might put such amenities on a par with a weight room and a track.

"I see this as a new frontier of fitness overall," says Alvaro Fernandez, founder and chief executive of SharpBrains.com, a Web site that tracks the business and science of brain-training. Americans already understand the value of physical fitness as a means of preserving the body's proper func-

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on to teach some of the skills at the Center for Healthy Aging in Santa Monica. She believes that the program has strengthened her memory, in part by underscoring the role that attention, stress reduction and exercise play in keeping the mind sound.

For decades, physicians and scientists asserted that declining mental performance is an immutable fact of aging. Brain cells inexorably are lost with age and wear-and-tear, they believed. And unlike most other organs capable of self-repair, lost brain cells cannot be replaced, they said.

But the past 15 years have brought about a revolution in thinking about the brain — not only its ability to generate replacement cells but to respond at any age to a stimulating environment by strengthening and developing new connections between cells and among different regions of the brain.

The bulk of this evidence is based on experiments done on animals — mostly rodents. But in recent years, human studies too have begun to link mental stimulation across the life span with better mental performance in old age — an effect that appears powerful enough to delay the symptoms even of a devastating brain disease like Alzheimer's. But is this neural "plasticity" happening in humans? Do training programs effect changes in the human brain? Will someone who improves his or her performance on a formal brain fitness program see improvements in everyday function? The answers to these crucial questions remain unclear.

"There is no consistent and compelling body of evidence at this time" that demonstrates the value of brain-fitness programs in humans, says Elkhonon Goldberg, a New York University

School of Medicine neuroscientist who advises companies, organizations and individuals interested in adopting a cognitive training program. "But this is not to suggest such evidence cannot be attained. It's just a matter of conducting appropriate studies."

Goldberg, who provides scientific advice on www.SharpBrains.com, says that as neuroscientists use imaging technologies to "see" the cellular changes that come with learning, he grows more confident that well-designed training programs can have discernible effects in preserving or repairing the intellectual function of older adults.

"This is shared hardware" that's being changed in the brain, "and to the extent you somehow enhance it, that will have wide-ranging effects," Goldberg says. "It provides a much more compelling *raison d'être* for this whole business."

In the past 18 months, published studies have begun to provide the first rigorous evidence that some brain-training exercises might have lasting effects on people — particularly the elderly — who use them. A trial using Posit Science's Brain Fitness program (and sponsored by the company) found that a group of subjects with an average age of 71 who went through the eight-week program showed marked improvements in memory overall compared with a group that had not received the training. Posit Science's program — a package of software costing about \$450 — currently targets one specific aspect of cognitive performance: how incoming sounds are understood and processed.

"We don't believe that the way to fix memory is to get people to remember more things," says neuroscientist Henry Mahncke, Posit Science's chief scientific officer. The company's Brain Fitness program instead targets what Mahncke calls one of the

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— Kathy Kurschner, 64-year-old Los Angeles resident



NINTENDO

'Brain Age: Train Your Brain in Minutes a Day' for the Nintendo DS gives your brain age at the end of each training session. The idea is to get that age to match your actual age or younger.

older customers. In two years, Nintendo's "Brain Age", a video game designed to be played on a hand-held game device, has sold 10 million copies world-

tion and preventing age-related diseases, says Fernandez.

He predicts that cognitive fitness will become a goal to which Americans equally aspire as we learn more about aging and the brain.

Kathy Kurschner, a 64-year-old Los Angeles resident now retired from the travel industry, says she possessed "an incredible memory" until a few years ago, when little lapses — not remembering the date, finding she could not hold on to the name and face of someone she had just met — told her "it was not so wonderful anymore."

When Kurschner saw a call for volunteers for a University of California, Los Angeles, program now called Memory Bootcamp, she readily signed up. The five-week session taught strategies designed to strengthen and support short-term, or "working," memory and tune up attention skills. Organized by UCLA psychiatrist Dr. Gary Small, the program now is offered in several Los Angeles locations.

"I want to do as much as I can to keep my mind alert," says Kurschner, who has gone