

Published July 1st, 2015

Video Games and Neuroscience

By Lou Fancher

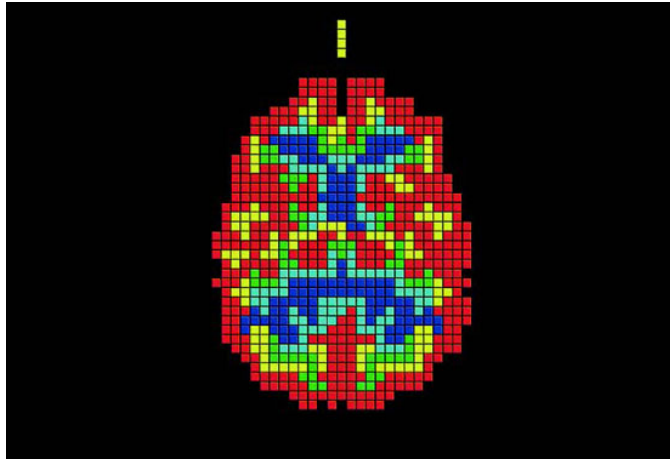


Illustration by Jennifer Daniel

endless equipment to build the body's endurance, flexibility, balance and power. Gazzaley says cognitive training equipment is "tragically lacking" and education is based on transferring information to the brain, not increasing the brain's power. Combating the effects of aging, disease and mental disabilities has been largely left to medication.

"We've been siloed into answering (mental health) needs with pharmaceuticals," Gazzaley said.

In his lab, scientists are working to prototype targeted, personalized, multimodal, closed-loop video games that harness the brain's neuroplasticity and boost desired outcomes for attention, focus and memory. The games are an ideal method for activating the brain selectively and providing feedback in the form of data. Able to adjust adaptively as EEG, heart rate, MRI imaging and other monitoring systems that evaluate a gamer's mental activity, video games can signal that a gamer's skill level is improving and boost the complexities for maximum results. Specific deficit areas in the brain can be targeted for therapeutic digital stimulation that a pill's blanket approach - impacting all regions of the brain instead of selectively - can't begin to imitate.

"We can use technology to literally fly through your brain and see how it's functioning while you're interacting with something," Gazzaley said.

Neuroracer - a game not commercially available but developed and used in his lab - enhances older adults' working memory and function. "Older adults (up to age 80) who trained on it had their multitasking mode improve even above that of 20-year-olds," Gazzaley said, referring to ground-breaking results published in the journal *Nature* in 2013.

But to build a consumer product, a video game has to be scalable for mass distribution. Founding Akili, a consumer-focused spinoff for which he now is chief neurological advisor, Gazzaley says the company is trying to get their brain training video games approved to compete with medicines prescribed for attention deficit disorders.

The effort may some day lead to games targeting MS, Parkinson's, autism, PTSD, ADD, Alzheimer's and a host of other brain impairments impacting people of different ages. Gazzaley gave a peek into the possibilities, describing "Meditrain," a meditation/video cross blend; "Rhythmicity," a game tapping into the music therapy domain; "Virtual Attention," aimed at distributing attention more broadly; and "Body-Brain Trainer," a game using motion capture that challenges a gamer both physically and cognitively.

In the not-too-distant future, a doctor's prescription might read like this: Take one-half the usual dose of pharmaceutical and apply 30 minutes of video gaming, daily.

Sound like a digital fantasy? It's not.

At a Commonwealth Club at the Lafayette Library and Learning Center on June 10, neurologist Adam Gazzaley presented an audience of approximately 100 people with a futuristic vision of brain training health care in the digital age.

The UCSF professor of neurology, physiology and psychiatry and director of the university's Neuroscience Imaging Center spends his days developing video games - or traveling worldwide to show people the mind-bending work performed in his Gazzaley Lab.

Humans have long sought out high-level results in the physical fitness realm. There's

KQED journalist and moderator Christina Farr asked Gazzaley if he'd been a hard core gamer as a child and tried repeatedly to get him to make "best video games for brain training" recommendations.

Gazzaley wasn't having any of it, and said that scientists need to "slow down" the hype about brain games. "We need to figure out what really works. It's very exciting, but I'd hate to see the baby thrown out with the bath water. We need to move the excitement back to the science."

Big pharmaceutical and insurance companies, the gaming community and medical professionals are interested in supporting the research. Gazzaley said that when Akili started raising funds, the first over-one-million dollar checks came from two Big Pharma companies. Even Google and Apple are jumping into the digital medicine pool and developing health care products and divisions, Gazzaley said.

Asked about addiction, a primary consumer concern with video games, he said gaming is just one aspect of a healthy lifestyle. "Technology has opened potential for us, but it's the most vulnerable information stream. If you're in control of your environment, it's not unreasonable to set aside technology and learn how to engage with one thing at a time." And for gamers who just can't stop, Gazzaley's lab is working on that problem too; designing games that lock out at the exact moment a game becomes addictive.

Reach the reporter at: info@lamorindaweekly.com

[back](#)

Copyright © Lamorinda Weekly, Moraga CA