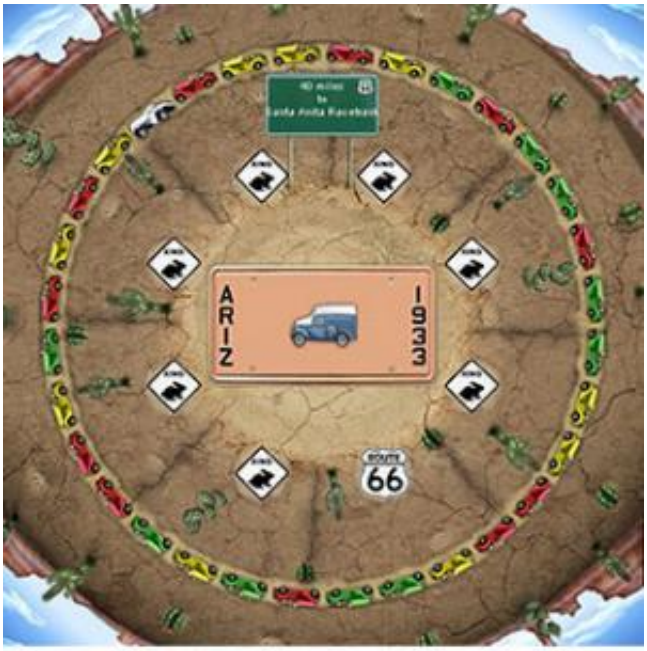
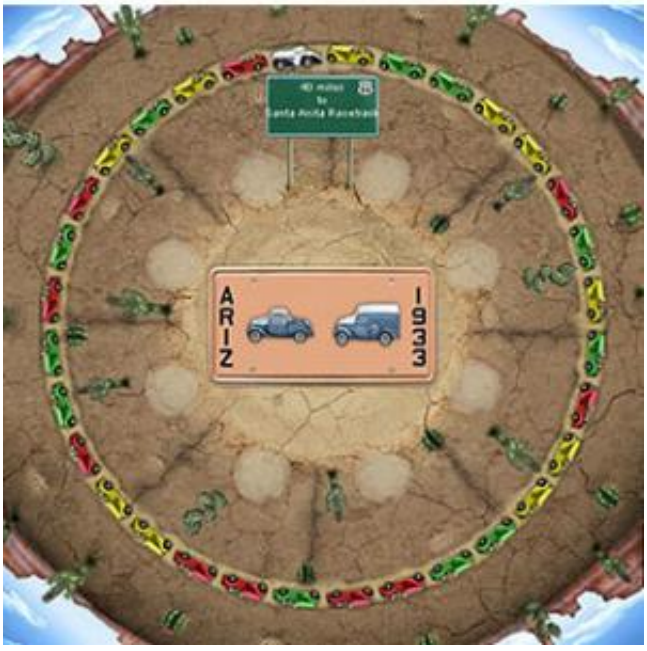
Study shows mental agility game slows cognitive decline in older people

May 1 2013





University of Iowa researchers report that older people who play video games challenging their mental processing speed will delay the aging of their minds. Credit: Fred Wolinsky lab, University of Iowa

There may be a way for older people to prevent natural aging of their minds, and it could be as simple as playing a video game.

That's according to a study from the University of Iowa, which found that elderly people who played just ten hours of a game priming their mental processing speed and skills delayed declines by as many as seven years in a range of cognitive skills.

"We know that we can stop this decline and actually restore cognitive processing speed to people," says Fredric Wolinsky, professor in the UI College of Public Health and lead author on the paper published May 1 in the journal *PLOS ONE*. "So, if we know that, shouldn't we be helping people? It's fairly easy, and older folks can go get the training game and play it."

The study comes amidst a burst of research examining why, as we age, our minds gradually lose "executive function," generally considered mission control for critical mental activities, such as memory, attention, perception and problem solving. Studies show loss of executive function occurs as people reach middle age; other studies say our cognitive decline begins as soon as 28 years of age. Either way, our mental capacities do diminish, and medical and public health experts are keen to understand why in an effort to stem the inexorable tide as much as possible.

Wolinsky and colleagues separated 681 generally healthy medical

patients in Iowa into four groups—each further separated into those 50 to 64 years of age and those over age 65. One group was given computerized crossword puzzles, while three other groups were exposed to a video game called "Road Tour." Briefly, the game revolves around identifying a type of vehicle (displayed fleetingly on a license plate) and then reidentifying the vehicle type and matching it with a road sign displayed from a circular array of possibilities, all but one of them false icons. The player must succeed at least three out of every four tries to advance to the next level, which speeds up the vehicle identification and adds more distractions, up to 47 in all.

The goal, naturally, is to increase the user's mental speed and agility at identifying the vehicle symbol and picking out the road sign from the constellation of distractors (which are rabbits, by the way).

"The game starts off with an assessment to determine your current speed of processing. Whatever it is, the training can help you get about 70 percent faster," says Wolinsky, who has no financial stake in the game.

The groups that played the game at least 10 hours, either at home or in a lab at the university, gained at least three years of cognitive improvement when tested after one year, according to a formula developed by the researchers. A group that got four additional hours of training with the game did even better, improving their cognitive abilities by four years, according to the study.

"We not only prevented the decline; we actually sped them up," Wolinsky says.

Improving people's processing speed is considered important for a host of reasons. One widely accepted benefit is widening a person's field of view. "As we get older, our visual field collapses on us," Wolinsky explains. "We get tunnel vision. It's a normal functioning of aging. This

helps to explain why most accidents happen at intersections because older folks are looking straight ahead and are less aware of peripherals."

Recognizing this, the National Institutes of Health in the late 1990s commissioned the largest cognitive training study of its kind, called ACTIVE. The national, multi-site trial, in which Wolinsky was involved, showed the elderly's memory, reasoning and visual processing speed could be improved with interventions, thus slowing the aging of their minds. But the ACTIVE study had its limitations: Among them, the control group didn't get any training and the primary goal was to assess the effects on seniors' field-of-view vision.

Wolinsky's team added an active control group—those doing the crossword puzzles. The researchers found those who played the "Road Tour" game also scored far better than the crossword puzzle group on tests involving executive function beyond field-of-view vision, such as concentration, nimbleness with shifting from one mental task to another and the speed at which new information is processed. The improvement ranged from 1.5 years to nearly seven years in cognitive improvement, the study found.

"It's the 'use it or lose it' phenomenon," Wolinsky says. "Age-related cognitive decline is real, it's happening, and it starts earlier and then continues steadily. The good news is we can do something about it. The question is will we?"

Provided by University of Iowa