

Perceptual training improves vision of the elderly

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Elderly adults can improve their vision with perceptual training, according to a study from the University of California, Riverside and Boston University that has implications for the health and mobility of senior citizens.

The study, "[Perceptual learning](#), aging, and improved visual performance in early stages of visual processing," appears in the current online issue of the *Journal of Vision*. It was funded by a \$3.5 million grant from the National Institute on Aging.

UCR researchers G. John Andersen, professor of psychology; Rui Ni, formerly a postdoctoral researcher; graduate student Jeffrey D. Bower; and Boston University psychology professor Takeo Watanabe conducted a series of experiments to determine whether repeated performance of certain visual tasks that are at the limits that one can see can improve the vision of adults older than 65.

"We found that with just two days of training, in one-hour sessions, with difficult stimuli resulted in older subjects seeing as well as younger college-age subjects," Andersen said. "The improvement was maintained for up to three months and the results were dependent on the location in the visual field where the stimuli were located – suggesting that the brain changed in early levels of visual cortex." The visual cortex is the part of the brain that processes visual information.

Age-related changes in vision – such as contrast sensitivity, dark

adaptation, visual acuity, spatial vision, orientation, depth perception and motion perception – have been substantiated in numerous previous studies. This is the first study that demonstrates that perceptual training can be used to improve vision among the elderly in the earliest levels of visual processing.

The researchers used a texture discrimination test in which the participants were presented with [stimuli](#) consisting of a letter embedded in the center of a field of horizontally oriented lines. In addition to the letter, an array of peripherally located lines was oriented diagonally and formed either a vertical or horizontal object, always presented in the same quadrant. That was followed quickly with the display of a masking pattern. The task was to identify the central letter and the peripheral object.

Improvements in vision were not due to practice or familiarity with the task, the researchers determined. And, the improved performance from perceptual training was maintained for at least three months. These results show a high degree of brain plasticity among the elderly and suggest that this technique is useful for recovering from declines in vision due to normal aging.

"Given the clear impact of age-related declines in [vision](#) on driving, mobility, and falls, the present study suggests that perceptual learning may be a useful tool for improving the health and well-being of an older population," the researchers concluded.

After age 60 there is a steady increase in the incidence of falls and automobile crashes that are associated with changes in visual processing. This research indicates that behavioral interventions are likely to be very useful for improving safety and quality of life as we get older, Andersen said.

Provided by University of California - Riverside

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