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A little practice can change the brain in a lasting way: study

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A little practice goes a long way, according to researchers at McMaster University, who have found the effects of practice on the brain have remarkable staying power.

The study, published this month in the journal Psychological Science, found that when participants were shown visual patterns—faces, which are highly familiar objects, and abstract patterns, which are much less frequently encountered—they were able to retain very specific information about those patterns one to two years later.

"We found that this type of learning, called perceptual learning, was very precise and long-lasting," says Zahra Hussain, lead author of the study who is a former McMaster graduate student in the Department of Psychology, Neuroscience & Behaviour and now a Research Fellow at the University of Nottingham. "These long-lasting effects arose out of relatively brief experience with the patterns – about two hours, followed by nothing for several months, or years."

Over the course of two consecutive days, participants were asked to identify a specific face or pattern from a larger group of images. The task was challenging because images were degraded—faces were cropped, for example—and shown very briefly. Participants had difficulty identifying the correct images in the early stages, but accuracy rates steadily climbed with practice.

About one year later, a group of participants were called back and their

performance on the task was re-measured, both with the same set of items they'd been exposed to earlier, and with a new set from the same class of images. Researchers found that when they showed participants the original images, accuracy rates were high. When they showed participants new images, accuracy rates plummeted, even though the new images closely resembled the learned ones, and they hadn't seen the original images for at least a year.

"During those months in between visits to our lab, our participants would have seen thousands of faces, and yet somehow maintained information about precisely which faces they had seen over a year ago," says Allison Sekuler, co-author of the study and professor and Canada Research Chair in Cognitive Neuroscience in the Department of Psychology, Neuroscience & Behaviour. "The brain really seems to hold onto specific information, which provides great promise for the development of brain training, but also raises questions about what happens as a function of development. How much information do we store as we grow, older and how does the type of information we store chage across our lifetimes? And what is the impact of storing all that potentially irrelevant information on our ability to learn and remember more relevant information?"

She and her colleagues point to children today who are growing up in a world in which they are bombarded with sensory information, and wonders what will happen.

"We don't yet know the long-term implications of retaining all this information, which is why it is so important to understand the physiological underpinnings," says Patrick Bennett, co-author and professor and Canada Research Chair in Vision Science in the Department of Psychology, Neuroscience & Behaviour. "This result warrants further study on how we can optimize our ability to train the brain to preserve what would be considered the most valuable

information."

More information: A pdf of the study can be found at: dailynews.mcmaster.ca/images/PsychSciFinal.pdf

Provided by McMaster University

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