Throughout life, even shortly before death, the brain can remodel itself, responding to a person's experiences. This phenomenon, known as neuroplasticity, offers a powerful tool to improve well-being, experts say.

"We now have evidence that engaging in pure mental training can induce changes not just in the function of the brain, but in the brain's structure itself," Richard Davidson, a neuroscientist at the University of Wisconsin-Madison, told an audience at the New York Academy of Sciences on Thursday (Feb. 6) evening.
The brain's plasticity does change over time, Davidson pointed out. For instance, young children have an easier time learning a second language or a musical instrument, he said.

Exercise for the mind

The idea of training the brain is not a radical one, said Amishi Jha, a neuroscientist at the University Miami and another panelist for the discussion.

"How many of you think engaging in certain kinds of physical activity will change the way the body works? Our cultural understanding now is that specific types of activity can alter the body in noticeable ways," Jha said, adding that this cultural understanding may be shifting to incorporate the mind as well. [10 Easy Ways to Keep Your Mind Sharp]

The panel discussion focused on a particular type of exercise: the practice of mindfulness, which panelist Jon Kabat-Zinn, a clinical mindfulness expert at the University of Massachusetts Medical School, defined as awareness.

"Mindfulness is awareness that arises from paying attention in the present moment, nonjudgmentally," Kabat-Zinn said.

Jha's personal interest in mindfulness arose from stress. As a young professor and mother under pressure from her job and family life, she ground her teeth so much that it caused numbness, interfering with her ability to speak. Jha attended a presentation Davidson gave and was startled to hear him say meditation, which cultivates mindfulness, could promote a positive pattern of electrical activity in the brain.

"I was like, 'I can't believe he used that word [meditation] in this auditorium,'” she said. "I had never heard it in a scientific context."

So, Jha began her own mindfulness practice, which not only reduced her stress level, but also inspired her to explore the topic as a neuroscientist.

Opening the door

There are many doors into mindfulness, said Kabat-Zinn. He gave two examples: A person can practice mindfulness by focusing on something, such as his or her own breath, and bringing his or her attention back to the breath when it begins to wander, Kabat-Zinn said.

It is also possible to practice awareness without choosing a particular object upon which to focus; however, "that turns out to be quite a challenging thing to do," he said.

Cultivating mindfulness like this can help break harmful cycles, such as those that accompany depression, in which the mind continues to repeat the same negative thoughts.

"When you see you are not your thoughts or your emotions, then you have a whole different palette of ways to be," Kabat-Zinn said.

Roots in the East

Many would say mindfulness as it is practiced in Western society has its roots in the East, in Buddhism, noted moderator Steve Paulson of the public radio program "To the Best of Our Knowledge."
"Is mindfulness a spiritual practice?" Paulson asked the panelists.

"For me, I don't talk about spirituality, because I don't know what spiritual means," the University of Wisconsin's Davidson said. "I think what we're talking about is part of every human being's innate capacity."

Buddhist monks, whom Davidson has studied, provide a "sample of convenience," a group of people who have all received the same training, an important consideration for research, he said.

The neuroscience

Brain scans of meditating people show different patterns of activity depending on the practitioner's level of experience. These patterns also differ depending upon the type of meditation practice used, Davidson said. [Mind Games: 7 Reasons You Should Meditate]

Work in Davidson's lab indicates a connection between meditation and resilience. A response to stress becomes problematic when someone perseverates, or has an emotional reaction long after the problem has ended. In the brain, this shows up as the prolonged activation of a region known as the amygdala.

Mindfulness can increase the speed of recovery in the amygdala, and the more hours of formal practice people have, the faster their amygdalas recover, the data indicate, Davidson said.

This panel was the last of a four-part series on consciousness, moderated by public radio host Paulson and presented by the Nour Foundation.