

Adults show poorer cognition, better well-being with age

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The study was led by Jyoti Mishra, PhD, an associate professor of psychiatry at UC San Diego School of Medicine and director of the NEATLabs, which study neuro-cognitive circuits across the lifespan. Credit: UC San Diego Health Sciences

The young and old could learn a thing or two from each other, at least when it comes to mental health and cognition.

In a new study, published September 12, 2022 in *Psychology and Aging*, researchers at University of California San Diego School of Medicine found that healthy older adults show greater mental well-being but poorer [cognitive performance](#) than younger adults. The underlying neural mechanisms may inspire new interventions to promote healthy brain function.

"We wanted to better understand the interplay between cognition and mental health across aging, and whether they rely on activation of similar or different [brain areas](#)," said senior author Jyoti Mishra, Ph.D., director of the NEATLabs and associate professor of psychiatry at UC San Diego School of Medicine.

The study sampled 62 healthy younger adults in their 20s and 54 healthy older adults above age 60. Researchers evaluated participants' mental health, surveying symptoms of anxiety, depression, loneliness and overall mental well-being. Participants also performed several cognitively demanding tasks while their [brain activity](#) was measured using electroencephalography (EEG).

The results showed significantly worse symptoms of anxiety, depression and loneliness in youth and greater mental well-being in older adults. Yet when it came to cognition, task performance was significantly lower in

older adults.

EEG recordings revealed that during the tasks, older adults showed greater activity in anterior portions of the brain's default mode network. This group of brain areas is typically active when an individual is ruminating, daydreaming or mind-wandering, and is usually suppressed during goal-oriented tasks.

"The default mode network is useful in other contexts, helping us process the past and imagine the future, but it's distracting when you're trying to focus on the present to tackle a demanding task with speed and accuracy," said Mishra.

While the default mode network seemed to interfere with cognition, several other brain areas appeared to improve it. Better task performance in younger adults was associated with greater activity in the dorsolateral prefrontal cortex, part of the brain's executive control system. In the older adults, however, those with better cognitive performance instead showed greater activity in the inferior frontal cortex, an area that helps guide attention and avoid distractions.

The [dorsolateral prefrontal cortex](#) is known to degrade with aging, so the researchers suggest the increased inferior frontal cortex activity may be a way for older adults to compensate during these tasks.

The team is now looking into therapeutic interventions to strengthen these frontal networks, such as brain stimulation methods, while also suppressing the default mode network through mindfulness meditation or other practices that orient individuals to the present.

"These findings may provide new neurological markers to help monitor and mitigate [cognitive decline](#) in aging, while simultaneously preserving well-being," said Mishra.

The study may also inspire new ways of addressing the [mental health](#) of younger adults. "We tend to think of people in their twenties as being at their peak cognitive performance, but it is also a very stressful time in their lives, so when it comes to mental well-being, there may be lessons to be learned from older adults and their brains," Mishra said.

Co-authors of the study include Gillian Grennan, Pragathi Priyadharsini Balasubramani, Nasim Vahidi, Dhakshin Ramanathan and Dilip V. Jeste, all at UC San Diego.

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More information: Gillian Grennan et al, Dissociable neural mechanisms of cognition and well-being in youth versus healthy aging., *Psychology and Aging* (2022). [DOI: 10.1037/pag0000710](https://doi.org/10.1037/pag0000710)

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