

Regions of the brain strengthen with age

November 3 2014, by Leah Burrows



Credit: AI-generated image ([disclaimer](#))

For years, research into the aging brain has examined what is usually lost—hearing, vision, memory. Age is synonymous with decline. But current research is refuting that discouraging perspective. New techniques in cognitive neuroscience are revealing regions of the brain that actually improve with age, reports assistant professor of psychology Angela Gutchess in the current issue of *Science*. BrandeisNow spoke with Gutchess about aging and how it changes our brains.

Current scientific research seems to support the old saying, 'with age comes wisdom.' Is that true?

It depends what we consider wisdom to be. There are a few studies that examine how younger and older adults think about conflict. When answers are scored for wisdom, based on ideas such as compromise and conflict resolution, older adults showed more wisdom than young adults. But we also might think about wisdom more broadly, including ideas such as how well we relate to others and maintain wellbeing. Despite the losses that do occur with age in physical and [cognitive abilities](#), one's sense of wellbeing actually increases later in life. Older adults improve at regulating, or controlling, their emotions with age. This may allow them to feel more positive emotion, and less negative emotion, throughout the day and in response to life's ups and downs compared to young adults.

How does this new approach, focusing on gains rather than losses, change how we think about aging?

The recognition of gains with age works hand-in-hand with our understanding of the plasticity, or malleability, in [brain](#) activity with age. One of the most exciting findings is that older adults do not recruit brain regions in the same way as [young adults](#). For example, older adults may activate regions in two hemispheres of the brain rather than just one hemisphere, or exhibit more activity in anterior regions of the brain, compared to the young. This discovery has led to a view of aging as a time with potential for continued development, through engagement in physical, social and cognitive activities. While [older adults](#) are eager to capitalize on this plasticity, scientific support lags behind new interventions to help.

The effects of neurostimulation on cognitive abilities

is a new area of study in aging research. When I hear about brain stimulation, I think mad scientists.

Neurostimulation involves stimulating the brain with an external device positioned over the scalp, either temporarily activating or suppressing [neural activity](#), and are low risk when operated according to safety guidelines. One of these methods stimulates the brain using little more than a 9V battery. Neurostimulation is exciting because it can provide critical tests of how brain regions function. In the past, methods only allowed us to view neural activity in humans without manipulating it, which made it difficult to determine how neural activity actually caused behaviors.

While these new methods promise to help us better understand cognition and the effects of age, they are limited in that they cannot target focal brain regions, or those deep within the cortex, such as some regions involved in memory. There is also much to be learned about how much these methods can impact cognition—are the effects long-term? Can they improve performance in everyday life?

Your research focuses on social and emotional processing in the aging brain. What are the biggest questions when it comes to understanding social and emotional processing in the aging brain?

There is some evidence that social and emotional processes may not decline with age as much as some [cognitive processes](#).

What I find most important about studying social and emotional processes is that these abilities rely on brain regions that are largely distinct from those supporting cognition. While cognitive processes are

well studied, social and emotional processes are not. Does aging affect cognitive and socio-emotional neural networks the same way? If [brain regions](#) underlying social and emotional processes are more intact with age, can they be used to support cognitive processes?

More information: "Plasticity of the aging brain: New directions in cognitive neuroscience." *Science* 31 October 2014: Vol. 346 no. 6209 pp. 579-582. [DOI: 10.1126/science.1254604](https://doi.org/10.1126/science.1254604)

Provided by Brandeis University

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