A Peek Inside the Brains of 'Super-Agers'

New research explores why some octogenarians have exceptional memories.

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By Dana G. Smith

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When it comes to aging, we tend to assume that cognition gets worse as we get older. Our thoughts may slow down or become confused, or we may start to forget things, like the name of our high school English teacher or what we meant to buy at the grocery store.

But that's not the case for everyone.

For a little over a decade, scientists have been studying a subset of people they call "super-agers." These individuals are age 80 and up, but they have the memory ability of a person 20 to 30 years younger.

Most research on aging and memory focu[illegible]other side of the equation — people who develop dementia in their later years. But, "if we're constantly talking about what's going wrong in aging, it's not capturing the full spectrum of what's happening in the older adult population," said Emily Rogalski, a professor of neurology at the University of Chicago, who published one of the first studies on super-agers in 2012.

A paper published Monday in the Journal of Neuroscience helps shed light on what's so special about the brains of super-agers. The biggest takeaway, in combination with a companion study that came out last year on the same group of

individuals, is that their brains have less atrophy than their peers' do.

The research was conducted on 119 octogenarians from Spain: 64 super-agers and 55 older adults with normal memory abilities for their age. The participants completed multiple tests assessing their memory, motor and verbal skills; underwent brain scans and blood draws; and answered questions about their lifestyle and behaviors.

The scientists found that the super-agers had more volume in areas of the brain important for memory, most notably the hippocampus and entorhinal cortex. They also had better preserved connectivity between regions in the front of the brain that are involved in cognition. Both the super-agers and the control group showed minimal signs of Alzheimer's disease in their brains.

"By having two groups that have low levels of Alzheimer's markers, but striking cognitive differences and striking differences in their brain, then we're really speaking to a resistance to age-related decline," said Dr. Bryan Strange, a professor of clinical neuroscience at the Polytechnic University of Madrid, who led the studies.

These findings are backed up by Dr. Rogalski's research, initially conducted when she was at Northwestern University, which showed that super-agers' brains looked more like 50- or 60-year-olds' brains than their 80-year-old peers. When followed over several years, the super-agers' brains atrophied at a slower rate than average.

No precise numbers exist on how many super-agers there are among us, but Dr. Rogalski said they're "relatively rare," noting that "far less than 10 percent" of the people she sees end up meeting the criteria.

But when you meet a super-ager, you know it, Dr. Strange said. "They are really quite energetic people, you can see. Motivated, on the ball, elderly individuals."

Experts don't know how someone becomes a super-ager, though there were a few differences in health and lifestyle behaviors between the two groups in the Spanish study. Most notably, the super-agers had slightly better physical health, both in terms of blood pressure and glucose metabolism, and they performed better on a

test of mobility. The super-agers didn't report doing more exercise at their current age than the typical older adults, but they were more active in middle age. They also reported better mental health.

But overall, Dr. Strange said, there were a lot of similarities between the super-agers and the regular agers. "There are a lot of things that are not particularly striking about them," he said. And, he added, "we see some surprising omissions, things that you would expect to be associated with super-agers that weren't really there." For example, there were no differences between the groups in terms of their diets, the amount of sleep they got, their professional backgrounds or their alcohol and tobacco use.

The behaviors of some of the Chicago super-agers were similarly a surprise. Some exercised regularly, but some never had; some stuck to a Mediterranean diet, others subsisted off TV dinners; and a few of them still smoked cigarettes. However, one consistency among the group was that they tended to have strong social relationships, Dr. Rogalski said.

"In an ideal world, you'd find out that, like, all the super-agers, you know, ate six tomatoes every day and that was the key," said Tessa Harrison, an assistant project scientist at the University of California, Berkeley, who collaborated with Dr. Rogalski on the first Chicago super-ager study.

Instead, Dr. Harrison continued, super-agers probably have "some sort of lucky predisposition or some resistance mechanism in the brain that's on the molecular level that we don't understand yet," possibly related to their genes.

While there isn't a recipe for becoming a super-ager, scientists do know that, in general, eating healthily, staying physically active, getting enough sleep and maintaining social connections are important for healthy brain aging.

Dana G. Smith is a Times reporter covering personal health, particularly aging and brain health. More about Dana G. Smith