

# Brains are different in people with highly superior autobiographical memory

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UC Irvine scientists have discovered intriguing differences in the brains and mental processes of an extraordinary group of people who can effortlessly recall every moment of their lives since about age 10.

The [phenomenon](#) of highly superior autobiographical memory – first documented in 2006 by UCI neurobiologist James McGaugh and colleagues in a woman identified as "AJ" – has been profiled on CBS's "60 Minutes" and in hundreds of other media outlets. But a new paper in the peer-reviewed journal *Neurobiology of Learning & Memory*'s July issue offers the first scientific findings about nearly a dozen people with this uncanny ability.

All had variations in nine structures of their brains compared to those of control subjects, including more robust white matter linking the middle and front parts. Most of the differences were in areas known to be linked to autobiographical memory, "so we're getting a descriptive, coherent story of what's going on," said lead author Aurora LePort, a doctoral candidate at UCI's Center for the Neurobiology of Learning & Memory.

Surprisingly, the people with stellar autobiographical memory did not score higher on routine laboratory memory tests or when asked to use rote memory aids. Yet when it came to public or private events that occurred after age 10½, "they were remarkably better at recalling the details of their lives," said McGaugh, senior author on the new work.

"These are not memory experts across the board. They're 180 degrees

different from the usual memory champions who can memorize pi to a large degree or other long strings of numbers," LePort noted. "It makes the project that much more interesting; it really shows we are homing in on a specific form of memory."

She said interviewing the subjects was "baffling. You give them a date, and their response is immediate. The day of the week just comes out of their minds; they don't even think about it. They can do this for so many dates, and they're 99 percent accurate. It never gets old."

The study also found statistically significant evidence of obsessive-compulsive tendencies among the group, but the authors do not yet know if or how this aids recollection. Many of the individuals have large, minutely catalogued collections of some sort, such as magazines, videos, shoes, stamps or postcards.

UCI researchers and staff have assessed more than 500 people who thought they might possess highly superior autobiographical memory and have confirmed 33 to date, including the 11 in the paper. Another 37 are strong candidates who will be further tested.

"The next step is that we want to understand the mechanisms behind the memory," LePort said. "Is it just the [brain](#) and the way its different structures are communicating? Maybe it's genetic; maybe it's molecular."

McGaugh added: "We're Sherlock Holmeses here. We're searching for clues in a very new area of research."

Provided by University of California, Irvine

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