

# Researched from birth, study participants now answer fundamental aging questions

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The Dunedin Study was only supposed to last three years.

Researchers intended to follow about 1,000 babies born in southern New Zealand until their third birthdays to better understand developmental problems in toddlers.

Fifty years later, those babies, now scattered across the globe and

graying, still dutifully return to the lab every half-decade to undergo exhaustive data collection.

The study—now lauded as one of the most notable longitudinal studies in the world—has given rise to more than a thousand scientific articles on a wide range of topics.

Terrie Moffitt and Avshalom Caspi, married Duke researchers, think the group may hold the key to answering some fundamental questions about the [aging process](#).

## Partners in life and science

Moffitt, associate director of the Dunedin Study, began traveling to New Zealand when the participants turned 13, to study which childhood characteristics were associated with delinquency and [drug use](#).

When she met Caspi at a research conference (where he wooed her with academia's version of a pick-up line, "I think you have great data") she folded him into the research project.

The two traveled back to New Zealand regularly to collect data along with researchers from the University of Otago, in southeastern New Zealand.

During these visits, they inspected almost every aspect of the participants' health. They interviewed participants about their relationships and behavior, performed brain scans, collected DNA samples, and checked the functioning of every organ system.

The longitudinal study pushed Caspi and Moffitt to approach scientific research in a unique way.

Where most scientists spend their careers finding new tools to answer a focused question, Caspi and Moffitt work in reverse: They search for questions this powerful study can answer.

Caspi likes to think of the study as a telescope.

"You don't put the telescope on just one star or even on one constellation," Caspi said. "You should use it to observe the universe."

As the participants changed with age, so too did the research questions.

When participants were 3, researchers focused their questions on potty training and their attachment to stuffed toys. In middle school, they asked about sports injuries. Now as the research participants turn 50, questions are focused on topics like menopause and retirement savings.

Using the treasure trove of health data collected over a lifetime, Caspi and Moffitt have begun uncovering some mysteries of aging like why some people's bodies appear to age faster than others.

In a 2021 study, Caspi found that participants with [mental disorders](#) tended to show signs of faster biological decline even when researchers controlled for factors like physical diseases, socioeconomic status and use of psychiatric medications.

The study used biological markers of aging they had been collecting for decades like cardiorespiratory fitness, blood pressure, and inflammation markers.

To [undergraduate students](#) at Duke shown photos of each participant, those with a history of mental illness even looked older.

The couple also led a team to develop a test that individuals can use to

see their pace of biological aging. Researchers trained an artificial intelligence algorithm to identify epigenetic markers associated with rapid aging in the Dunedin population so that it can detect the pace of aging in new samples.

"People might want to do this before they join the gym or before they quit smoking... and then check their pace of aging again at the end of the year and see if they've been able to slow their own aging," she said.

The technology was licensed to TruDiagnostics, and is available as part of packages for purchase.

## **'I doubt you could do this today'**

What sets the Dunedin Study apart from most [longitudinal studies](#) is its impressive retention rate.

Studies that take place over decades often lose participants in the process, which can make the study group unrepresentative of the broader population and the results of the study difficult to generalize.

After 50 years, 94% of the original participants have stuck with the study. Part of their retention success is inertia—the longer people participate, the more they feel a need to see it through, Moffitt said.

Participants also take pride in their contributions to society.

"They come from a small country that's at the bottom of the world and it's not even on many maps—they're used to being ignored," she said.

"Their part in this is almost like being on a winning Olympic team."

Despite the study's success, it could be the last of its kind.

Caspi said people's trust in science and government has eroded, making it increasingly difficult to recruit participants into studies, especially those that require decades of participation.

"I doubt you could do this today," Caspi said. "To give themselves and their time to science is something that a lot of people just don't care to do because they don't trust what we'll do with it."

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