

An experiment done by Richard Chi and Allan Snyder, both then at the Center for the Mind at the University of Sydney, has used a relatively new technology to provide some evidence that these brain changes account for the acquired savant skills. Us-

ing transcranial direct-current stimulation (tDCS), these researchers induced savantlike abilities in human volunteers. The technique generates a polarized electric current to diminish activity in a part of the left hemisphere involved with sensory input,

memory, language and other brain processes while increasing activity in the right hemisphere (the right anterior temporal lobe).

The investigators then asked study participants to solve the challenging “nine-dot” puzzle either with or without tDCS—a task that requires the creativity to search for a solution in an unconventional way. Participants had to connect three rows of three dots using four straight lines without lifting a pen or retracing lines. None of them could solve it before stimulation, and when 29 subjects were exposed to “sham” stimulation—electrodes emplaced without any current to test for placebo effects—they were still at a loss. With the current switched on, however, some 40 percent—14 of 33 participants—worked their way through the puzzle successfully.

How can a person suddenly perform so much better at the flip of a switch? Because these instant savants—and congenital and acquired savants as well—“know things” innately they were never taught. Clemons, the sculptor, had no formal training in art but knew instinctively how to produce an armature, the frame for the sculpture, to enable his pieces to show horses in motion.

One plausible explanation for the hidden talents that emerge in savant syndrome—whether early in life or induced by injury—is that these reservoirs of skill and knowledge must be inherited in some way. We do not start life with a blank slate that subsequently gets inscribed through education and other life experiences. The brain may come loaded with a set of innate predispositions for processing what it sees or for understanding the “rules” of music, art or mathematics. Savants can tap into that inherited knowledge far better than the average person can.

The Genius Switch

Knowing that these talents can emerge even later in life raises the question of

CASE HISTORIES

The Ultimate Eureka Moments

Acquired savantism has given people the ability to pursue poetry, music and instantaneous mental calculations. A few cases from a registry of savants follow:

The late Tommy McHugh was a 51-year-old builder in Liverpool, England, without any particular interest in poetry or painting. After suffering in 2001 a hemorrhage in the lining of the skull that damaged the frontal area of his brain, he suddenly began to fill notebooks with poems and to spend much of his time painting and sculpting. Physicians attributed this new talent to “relative disinhibition,” which frees up the ability to evoke unusual word juxtapositions or imagery. McHugh has had exhibits in the U.K., and his story has been chronicled in a number of television documentaries.

Orlando Serrell, mentioned earlier, who began doing calendar calculations as a boy after being knocked out by a baseball, can determine the day of the week for any day since the injury occurred. He also recalls the weather every day since his injury. Now at 44, the Virginia man is still able to calendar-calculate, but his memory skills have advanced so that he can remember the minutest details of each day’s activities—a condition known as hyperthymestic memory. Brain scans at Columbia University Medical Center have confirmed that Serrell engages in unconscious calculating—and his skill is not based on memorizing the calendar.

Derek Amato was a 40-year-old corporate trainer in Colorado with no special interest or skill in music. In 2006 he dove into the shallow end of a swimming pool, sustaining a severe concussion and losing some hearing in one ear. Following his hospital discharge, he was inexplicably drawn to the piano, which he had never touched before. He began to see black-and-white spots that he was able to transpose from his head into notes on the piano. He now makes his living composing, performing and recording.

Tony Cicoria, an orthopedic surgeon from New York, was talking on the telephone in 1994 when he was struck by lightning. Presumed to be in cardiac arrest, he was resuscitated by a nurse who was waiting to use the phone. For a week or two he had some mild memory problems. Those eventually subsided, and he resumed his orthopedic surgery practice full-time with no residual effects from the lightning strike. But one thing had changed. He developed a consuming obsession with classical music. Before the incident, he thought of himself as mainly a “rocker.” But his newfound obsession morphed into a desire to play classical music as well. Shortly after his injury, he heard music in a dream. The tune stuck with him, resonating in his head whether he was awake or asleep. Finally, he decided to transcribe the earworm into a 26-page concert piano piece called *Fantasia: The Lightning Sonata*, op. 1.

Jason Padgett, who developed a passion for math, physics and drawing geometric shapes after he sustained a concussion following the assault mentioned earlier, still runs three futon stores in Washington State. He now calls the injury, mentioned earlier, a “rare gift.” Before the mugging, Padgett described himself as being among the “math-averse.” Now the former college dropout takes higher-level math courses to fully understand the geometric figures that are his obsession, and he has written a popular book about his experiences. —D.A.T.