

# Can this man put you in touch with your natural genius?

Allan Snyder claims his brain machine can stimulate creativity in anyone. At least it helps you to draw a dog, says **Susan Wyndham**

"My ultimate desire is to make a thinking cap," says Professor Allan Snyder, without the slightest whinny of laughter. So I deduce he must be serious. It's not always easy to tell with this acclaimed scientist — a Harry Potter wizard with a dash of Woody Allen, who has approached the mysteries of human creativity via the study of insect eyes, fibre optics and autism.

We're at the Centre for the Mind in the University of Sydney's sandstone Gothic quadrangle, where Snyder, the director, is about to shut down part of my brain. Before he hooks me up to his transcranial magnetic stimulator (TMS), he rubs his hands and cackles in a horror-movie voice: "Don't worry. You won't remember a thing."

I'm pretty sure he's joking.

Beyond the playfulness, his mission is earnest and wildly ambitious: to prove that all human beings have unused mental abilities, and to find an artificial way to tap into our "inner savant". His current experiments use TMS to enhance ordinary subjects' ability to draw, read, memorise detail and make numerical calculations.

If he can turn me into an artist, I challenge him, he's a genius. Snyder arranges his Yankees baseball cap backwards over his golden curls and gives a high-pitched giggle.

Back in 1987, when he was a guest research fellow at the Royal Society in Cambridge, the American-born Snyder co-wrote a paper published in *Nature* journal, *Revealing the Artist's Touch*. He argued that human beings don't really see what's in front of them but project on to the world what they already know in order to process information quickly. Instead of seeing eyes, nose, mouth, chin — "aha, a face" — we go straight to the complete image of a face.

As he puts it now: "We get the executive decision and not the back-room deliberations. We manoeuvre rapidly on this earth because of that. But what does it do? It gives us prejudice. We think in mindsets. I wondered what it would be like if you could tap into your unconscious mind and see the world the way it really is."

In Sydney some years later, Snyder read Oliver Sacks's book of neurological cases histories, *The Man Who Mistook His Wife for a Hat*. He was taken with the stories of autistic savants who, although they lacked intellectual and emotional development, had extraordinary artistic, arithmetical or musical powers.

Three-year-old Nadia, for example, could not tell her mother from her nurse but could draw horses in perfect, three-dimensional, animated form — "indistinguishable from Leonardo da Vinci's type of drawing". Other savants could instantly tell which day of the week certain dates fell on in any year, play a Beethoven sonata after one hearing or, like Dustin Hoffman's character in the film *Rain Man*, memorise long numbers and make lightning calculations.

Nadia lost her ability as she grew up and learnt to speak. But Snyder remained fascinated and his office is decorated with huge blow-ups



**Draw your conclusions ... top, Wyndham's dog before and after TMS; above, her efforts at a woman's face**

of Nadia's galloping stallions and the stick-figure horses drawn by normal children.

Gradually, he reached the radical conclusion that all of us have innate savant skills that are normally suppressed. In a paper written in 1999 with an Australian colleague, D. John Mitchell, he observed how difficult it was for the average person to draw something as simple as a sphere, because "we are not consciously aware of how our brains derive shape from shading, perspective from gradients of texture . . . and so on".

Savants, on the other hand, draw in a more literal way and make rapid calculations because they "have privileged access to lower levels of 'raw' information".

But Snyder and Mitchell rejected the usual explanations that savants' skills result from obsessive learning or, like geniuses, from rare and innate talent. Since some people have become savants after illness or accidents, they speculated that we can all access those skills via "induced altered states of consciousness".

That's why I'm sitting in Snyder's lab with a silly cloth cap on my head and an electromagnetic pulse banging into my left temporal lobe, slowing the region of my brain that controls language, logic and conceptual thinking.

Transcranial magnetic stimulation temporarily rearranges the electrical field created by neurons, the cells that transmit messages in the brain. It is a fairly new but accepted diagnostic tool in neurology and has been used to treat psychiatric conditions such as depression. Coincidentally, researchers have found that TMS can produce bursts of savant ability. Snyder believes meditation, hypnosis or drugs might also produce the effect he is looking for, but he's not sure he could control them.

The test begins before my brain is zapped. Snyder tells me to take one minute to draw a dog from memory and suddenly I have no idea what a dog really looks like. My profile of a sitting dog looks like a stunted kangaroo.

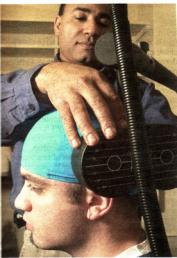
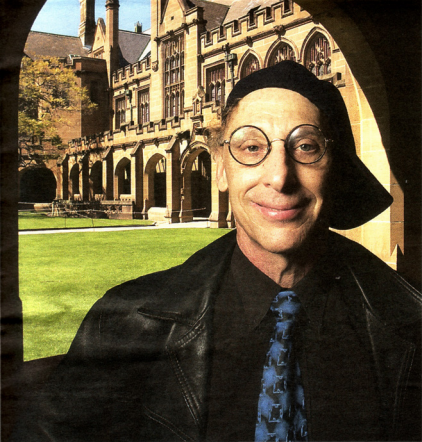
Next, I have to study images of two women's faces on a computer screen for 15 seconds each and then draw them. They are attractive women — one blonde and pale skinned, the other dark and fluffy haired — but their even features turn into generic cartoon faces. How do you draw a nose?

Finally, I have to read out sentences as the computer flashes them at me: "When in Rome do as the Romans do."

"Laughter is the best medicine."

After 15 minutes of TMS, Snyder repeats the exercises and then compares the results. Clearly I have not become Leonardo da Vinci. But at least my second dog has four legs and a mouth. "An elaborated schema," Snyder kindly calls it. My post-TMS faces are less like cartoons, with more detail, shading and personality. I have captured spiky eyebrows, asymmetrical lips and the framing of one picture, which cuts off the top of the woman's hair.

Unfortunately, I have failed the proofreading test. Before TMS, people invariably fail to notice that words are repeated in some of the



**If the cap fits . . . Allan Snyder believes he can open the door to our unconscious**  
**Left: the brain stimulator in action**

jects respond to TMS because of variations among brains and the difficulty in hitting exactly the right spot.

Around the world, Snyder's work is watched with a mixture of excitement and scepticism. A team at Flinders University in Adelaide, South Australia, has used TMS to investigate his hypothesis and found that five of their 17 participants showed improved savant-like skills. "I am sceptical that savant skills lie in all of us," says Dr Robyn Young, a team member and senior lecturer in the school of psychology. "But following our research I am now of the belief that TMS does allow access to some cognitive functions that are otherwise inaccessible when higher level processes are operating effectively."

Work on inner savants is also under way in the United States. "I do believe there is a little Rain Man within us all," says Dr Darold A. Treffert, a psychiatrist at St Agnes Hospital in Wisconsin. While he's interested in Snyder's work, he cautions: "I think the mechanisms involved in tapping such hidden potential are more complex, more intricate, deeper and more involved than TMS can trigger."

Dr Tony Ro, associate professor of psychology at Rice University in Houston, has used TMS to shut down visual awareness. "There may be some potential in what Snyder is doing," he acknowledges. "For example, 'shutting down' areas of the brain involved with inhibition may lead to improved functions on some tasks. I highly doubt that one will ever be able to shut down the conscious parts of the brain in the sense that Snyder claims, because it is presently unknown what part of the brain gives rise to this type of consciousness and it is likely to be a function of many different areas."

Undeterred, Snyder says: "If you're working on things that everyone accepts, you're not working on anything."

He describes his use of TMS as "a creativity-amplifying machine", the first step towards his thinking cap. "Our brain is exquisitely tuned to do what we need most often, but for weird, abstract things you would be able to turn this on and accelerate learning and be more creative. It doesn't mean you would become a savant but you would be able to see the world literally and combine it with the usual conceptual mind."

This is only one part of his work at the Centre for the Mind, a joint project of the Australian National University in Canberra and the University of Sydney. His bigger agenda of "what makes us uniquely human" has him exploring the qualities of champions and the power of the unconscious mind to direct decision-making. Why do we know immediately that we like one person while we abhor another? And why do answers to problems often come spontaneously when we've stopped thinking about them?

**Born to be different.** Snyder is the son of a Philadelphia banker who dreamt of owning a beat cafe and a Broadway actress who became a psychodrama therapist. While his two brothers became award-winning artists, Snyder channelled his creativity into the study of science at Harvard and Massachusetts Institute of Technology.

For his PhD from University College London, he wrote a thesis on the photoreceptors of insects and humans, examining the way different creatures' eyes are adapted for their specific needs. He found the British university system less formal and more supportive of personal exploration than the American.

As a Fellow of the Royal Society, he gave the 2001 Clifford Patterson Prize lecture on his work in soliton physics, the rather esoteric study of how light guides itself. That year he was also joint winner of the Marconi International Prize for designing devices that enabled fibre optic cables to be laid around the world. Those ideas came, of course, from his knowledge of insect eyes.

"Creativity is making seemingly disparate ideas into a new synthesis and experts are terrible at that," he says. "Most academics don't get to do anything unique. They are automatons."

Snyder was working at Yale in the late 1980s when an invitation came to visit the Australian National University. "I took a sabbatical from Yale and went slowly across the Pacific because of my love of anthropology, through all the islands and New Guinea. When I came here I loved it."

As well as holding chairs and professorships in optical science, Snyder established his Centre for the Mind in Canberra in 1997 and Sydney in 2000, with Oliver Sacks as foundation fellow. "I love our Vice-Chancellor," he says of Gavin Brown at the University of Sydney. "When I came here I said, 'What do you want of me?' and he said, 'I want you to make these universities known for being more than just vocational, and I want you to win the Nobel Prize.'"

Working at the imaginative edge of science, Snyder can be both rigorous and eccentric. As we talk, he springs from idea to idea, misplaces his umbrella and walks off with my notebook. At home later, a few steps from the university gates, he will scribble notes in bed until 3am. His eyes bulge behind the round glasses as he says: "Even though I don't consider myself a traditional scientist, I am a driven maniac when it comes to an idea and I'd give up my life for it."

well-known sayings because their brain sees what it expects. Even Oliver Sacks read one sentence 30 times without seeing the repetition. After TMS, most people pick up the trick. However, I have read all the sentences correctly before and after TMS, which is because pre-reading is part of my job, but probably because I had already seen a similar test.

So, has the experiment proved anything? "You shifted in the direction we predicted," Snyder says, adding that only 40 per cent of sub-