

# Daniel Tammet: Inside the mind of a staggering genius

Daniel Tammet can recite pi to 22,514 decimal places and speak seven languages, one of which he learnt in a week. Unlike other 'prodigious savants', he knows how he does it

- **By Sarah Meyrick**
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Daniel Tammet is doing mental arithmetic:  $37 \times 37 \times 37 \times 37$ . His fingers hover above the table, tracing shapes visible to no one but himself. A few seconds later, he smiles: the answer is 1,874,161.

Too easy, perhaps: the testers think he may have memorised the cube of every number up to 100. Can he divide 13 by 97? His hands take up the dance again, and he begins: "0.1340206..." He continues reciting decimal points long after the calculator has stopped displaying them.

Calculations such as these are unlikely to faze Tammet: last year, he set a new record when he flawlessly recalled pi to 22,514 decimal places. Aged 26, he speaks seven languages, and is developing an eighth of his own.

Technically, he's what is called a "prodigious savant" - one of an exclusive club of only 50 people in the world with such extraordinary mental abilities. He also has Asperger syndrome.

Asperger syndrome is a form of autism. It affects the way a person communicates and relates to other people. According to the National Autistic Society, an estimated 212,000 people (out of an autistic population of 535,000) have Asperger's in Britain today. People with the condition find social relationships difficult, largely because they find it impossible to put themselves into other people's shoes. They struggle to read non-verbal signals such as facial expressions, tend to be over-literal in their understanding of language, and can be bewildered by jokes and metaphors.

Asperger's is frequently associated with above-average intelligence, and an impressive memory is not uncommon. As so well demonstrated this week by Andrew Cowan, the 11-year-old Asperger's sufferer who, with his specialist knowledge of the Star Wars trilogy, has beaten hundreds of other young candidates to win a place on Junior Mastermind, people with the condition can store away an extraordinary amount of information. Abilities such as Tammet's, however, are way off the normal scale. Any single aspect of his extraordinary mind would be enough to make him a savant, but he has three areas of outstanding expertise: his ability with numbers, his memory, and his gift for languages.

Specialists believe Tammet's case may offer groundbreaking insights into the workings of the brain. What marks him out is not just his prodigious intelligence but the fact that he is unusually - uniquely, in fact - articulate about the workings of his mind. He describes his experience of synaesthesia, which means he perceives words and emotions as colours, textures or pictures. The word "complex", for example, is a braid of hair; "fragile" makes him think of glass.

Tammet explains his fluency with numbers as the result of the way he perceives them: for him, every number up to 10,000 has a unique visual form. "Different numbers have different colours, shapes and textures," he says. "[The number] one is very bright and shining, like someone flashing a light into my face. Two is like a movement from right to left. Five is a clap of thunder or the sound of a wave against a rock. Six I find more difficult: it's

more like a hole or a chasm. When I multiply numbers, I see two shapes in a landscape. The space between the images makes a third shape, like a jigsaw piece. And that third shape gradually crystallises: I see a fuzziness that becomes clearer and clearer." The whole process takes place in a flash, "like sparks flying off".

Tammet has always loved numbers. He's always been different, too. When he was three, he had a series of seizures. Epilepsy is relatively common among people with autism, although no one at the time knew he was autistic. The epilepsy is thought to have rewired his brain; it may have triggered the synaesthesia.

When he was four, he was given a Ladybird book called Counting, and suddenly the world began to make sense. He remembers sitting for hours in exactly the same spot on the floor of his bedroom, lost in a world of numbers. "Numbers were the most real thing for me," he says. "You could say that they form the way I look at the world. They are my first language."

He soon discovered he was more comfortable with numbers than with people. School was never easy: he didn't fit in. He was fortunate to have a large and supportive family (he is one of nine) who accepted him as he was. Nonetheless, some aspects of family life were hard: he found certain noises, such as the sound of tooth-brushing, excruciating to listen to, and took pains to avoid the bathroom when one of his brothers or sisters was using a toothbrush.

"Luckily, I had my own room. I would sit there, listening to the silence. For me, silence is more than an absence of noise - it has a particular quality to it. It is soft and silvery, trickling around my head, rather like condensation. That's one reason why I find sudden noise very painful. It feels as if something entirely tactile is being shattered."

Tammet had one or two friends, but he was hampered by what is known as mind-blindness. "It is hard for someone with Asperger's to realise another

person has thoughts entirely separate from your own. For me, that's not intuitive. I remember going on holiday with another family, and I got homesick and rang home from a phone box. Mum said she would ring me back. I waited for an hour. I didn't realise that I had to give her the number. I assumed because I had it, she did too."

Tammet has made huge strides forward in adapting to his Asperger's, but he still struggles with some everyday skills. He can't drive, for example, because his mind tends to wander, and he is not very practical. "I can't wire a plug, or do any DIY, but I can cook, because that's like doing a sum." He also finds conversation hard, because he tunes in and out, rather as if he is listening to a radio interrupted by static.

He also suffers from anxiety if he goes into a public place where he can't predict what will happen, although he has learned to calm himself by closing his eyes and counting until the panic passes. He is lucky, he says, to have a sympathetic partner, Neil, and he is happy to spend most of his time at home in Kent, from which he runs an online tutoring business.

Tammet's extraordinary story is the subject of a new documentary, *The Boy with the Incredible Brain*, part of Channel Five's 'Extraordinary People' series. The programme traces his journey around the world to meet some of the specialists who are interested in his case. They set him a series of tests, one of which was to learn Icelandic within a week. He was given a tutor who declared the task impossible. A week later, he appeared on television and gave an interview in perfect Icelandic.

He loved Icelandic. "I found it aesthetically pleasing. Icelandic is perfect for an autistic person because it is a very visual language. I think in pictures, and Icelandic works like that, in that abstract words are described in concrete terms. So, for example, the word for garlic means literally 'white onion' and the word for carrot means 'yellow root'. The word for idea is literally 'mind-picture'."

Like his work with numbers, the way he learns a language is primarily visual. The Linguaphone approach of listening and repeating would not work for him; he has to see it written down. "A lot of it comes down to pattern-spotting, seeing shapes and structures. Most people learning a language work primarily from grammar tables and verb tables. I learn more intuitively than that. My mind is very well wired to patterns, so rather than pulling out the rules, I pull out the patterns."

Professor Simon Baron-Cohen, director of the Autism Research Centre in Cambridge, is one of those interested in what can be learned from Tammet's case. "When you have an individual who has savant ability, is it because he has synaesthesia or autism or both?" he asks. "Are these two factors necessary to produce this level of talent?"

He points out that Asperger syndrome is relatively new as a subject for study in the English-speaking world: Hans Asperger identified the condition in 1944, but his work was only translated from German in the 1990s. And scientists only began to take synaesthesia seriously 20 years ago, when more sophisticated brain scans demonstrated that the experience truly existed. No one has yet proved a link with autism. "That's something we are still researching," he says.

Tammet himself is pleased with the programme. He found all the travelling stressful, but the best part was meeting Kim Peek, the savant who was the inspiration for the 1988 film *Rain Man*. "We had an immediate connection. It was extremely moving. That was the most special part of the whole experience."

*'The Boy with the Incredible Brain' is on Five on Monday 23 May*