A GENIUS EXPLAINS

By Richard Johnson
The Guardian

1 Daniel Tammet is talking. As he talks, he studies my shirt and counts the stitches. Ever since the age of three, when he suffered an epileptic fit, Tammet has been obsessed with counting. Now he is 26, and a mathematical genius who can figure out cube roots quicker than a calculator and recall pi to 22,514 decimal places. He also happens to be autistic, which is why he can't drive a car, wire a plug, or tell right from left. He lives with extraordinary ability and disability.

2 Tammet is calculating 377 multiplied by 795. Actually, he isn't "calculating": there is nothing conscious about what he is doing. He arrives at the answer instantly. Since his epileptic fit, he has been able to see numbers as shapes, colors, and textures. The number two, for instance, is a motion, and five is a clap of thunder. "When I multiply numbers together, I see two shapes. The **image** starts to change and evolve, and a third shape emerges. That's the answer. It's mental imagery. It's like maths without having to think."

sun creates: "day." Tammet hopes to launch Mänti in academic circles later this year, his own personal exploration of the power of words and their inter-relationship.

3 Tammet is a "**savant**," an individual with an astonishing, extraordinary mental ability. An **estimated** 10% of the autistic population—and an estimated 1% of the non-autistic population—have savant abilities, but no one knows exactly why.

4 Scans of the brains of autistic savants suggest that the right hemisphere might be **compensating** for damage in the left hemisphere. While many savants struggle with language and comprehension (skills associated primarily with the left hemisphere), they often have amazing skills in mathematics and memory (primarily right hemisphere skills). Typically, savants have a limited vocabulary, but there is nothing limited about Tammet's vocabulary.

5 Tammet is creating his own language, strongly influenced by the vowel and image-rich languages of northern Europe. (He already speaks French, German, Spanish, Lithuanian, Icelandic, and Esperanto.) The vocabulary of his language—"Mänti," meaning a type of tree—reflects the relationships between different things. The word "ema," for instance, translates as "mother," and "ela" is what a mother creates: "life." "Päike" is "sun," and "päive" is what the

6 Last year, Tammet broke the European record for recalling pi, the mathematical constant,[1] to the furthest decimal point. He found it easy, he says, because he didn't even have to "think." To him, pi isn't an abstract set of digits; it's a visual story, a film projected in front of his eyes. He learnt the number forwards and backwards and, last year, spent five hours recalling it in front of an adjudicator.[2] He wanted to prove a point. "I memorised pi to 22,514 decimal places, and I am technically **disabled**. I just wanted to show people that disability needn't get in the way."

7 Tammet is softly spoken, and shy about making *eye* contact, which makes him seem younger than he is. He lives on the Kent coast, but never goes near the beach—there are too many pebbles to count. The thought of a mathematical problem with no solution makes him feel uncomfortable. Trips to the supermarket are always a chore. "There's too much mental stimulus. I have to look at every shape and texture. Every price, and every arrangement of fruit and vegetables. So instead of thinking,'What cheese do I want this week?', I'm just really uncomfortable."

8 Tammet has never been able to work 9 to 5. It would be too difficult to fit around his daily routine. For instance, he has to drink his cups of tea at exactly the same time every day. Things have to happen in the same order: he always brushes his teeth before he has his shower. "I have tried to be more **flexible**, but I always end up feeling more uncomfortable. **Retaining** a sense of control is really important. I like to do things in my own time and in my own style, so an office with targets and bureaucracy just wouldn't work."

9 Instead, he has set up a business on his own, at home, writing e-mail courses in language learning, numeracy, and literacy for private clients. It has had the fringe **benefit** of keeping human interaction to a minimum. It also gives him time to work on the verb structures of Mänti.

10 Few people on the streets have recognised Tammet since his pi record attempt. But, when a documentary about his life is broadcast on Channel 5 later this year, all that will change. "The highlight of filming was to meet Kim Peek, the real-life character who inspired the film *Rain Man*. Before I watched *Rain Man*, I was frightened. As a nine-year-old schoolboy, you don't want people to point at the screen and say, 'That's you.' But I watched it and felt a real connection. Getting to meet the real-life Rain Man was inspirational."

11 Peek was shy and introspective, but he sat and held Tammet's hand for hours. "We shared so much—our love of key dates from history, for instance. And our love of books. As a child, I regularly took over a room in the house and started my own lending library. I would separate our fiction and non-fiction, and then alphabetise them all. I even introduced a ticketing system. I love books so much. I've read more books than anyone else I know. So I was delighted when Kim wanted to meet in a library." Peek can read two pages simultaneously, one with each eye. He can also recall, in exact detail, the 7,600 books he has read. When he is at home in Utah, he spends afternoons at the Salt Lake City public library, memorising phone books and address directories. "He is such a lovely man," says Tammet. "Kim says, 'You don't have to be handicapped to be different—everybody's different.' And he's right."

12 As a baby, he (Tammet) banged his head against the wall and cried constantly. Nobody knew what was wrong. His mother was **anxious**, and would swing him to sleep in a blanket. She breastfed him for two years. The only thing the doctors could say was that perhaps he was understimulated. Then, one afternoon when he was playing with his brother in the living room, he had an epileptic fit.[3]

13 "I was given medication—round blue tablets—to control my seizures and told not to go out in direct sunlight. I had to visit the hospital every month for regular blood tests. I hated those tests, but I knew they were necessary. To make up for it, my father would always buy me a cup of squash to drink while we sat in the waiting room. It was a worrying time because my Dad's father had epilepsy and actually died of it, in the end. They were thinking, 'This is the end of Daniel's life.' "

14 He remembers being given a Ladybird book called *Counting* when he was four. "When I looked at the numbers, I 'saw' images. It felt like a place I could go where I really belonged. That was great. I went to this other country whenever I could. I would sit on the floor in my bedroom and just count. I didn't notice that time was passing. It was only when my Mum shouted up for dinner, or someone knocked at my door, that I would snap out of it."

15 One day his brother asked him a **sum**. "He asked me to multiply something in my head—like 'What is $82 \times 82 \times 82 \times 82$?' I just looked at the floor and closed my eyes. My back went very straight, and I made my hands into fists. But after five or 10 seconds, the answer just flowed out of my mouth. He asked me several others, and I got every one right. My parents didn't seem surprised. And they never put pressure on me to perform for the neighbours. They knew I was different but wanted me to have a normal life as far as possible."

16 Tammet could see the car park of his infant school from his bedroom window, which made him feel safe. "I loved assembly because we got to sing hymns. The notes formed a pattern in my head, just like the numbers did." The other children didn't know what to make of him and would tease him. The minute the bell went for playtime, he would rush off. "I went to the playground, but not to play. The place was surrounded by trees. While the other children were playing football, I would just stand and count the leaves."

17 Tammet may have been teased at school, but his teachers were always protective. "I think my parents must have had a word with them, so I was pretty much left alone." He found it hard to socialise with anyone outside the family, and, with the advent of adolesence, his shyness got worse.

18 After leaving school with three A-levels (History, French and German, all grade Bs), he decided he wanted to teach—only not the **predictable**, learn-by-rote type of teaching. For a start, he went to teach in Lithuania, and he worked as a volunteer. "It was also the first time I was introduced as 'Daniel' rather than 'the guy who can do weird stuff in his head.' It was such a pleasant relief." Later, he returned home to live with his parents and found work as a maths tutor.

19 When he isn't working, Tammet likes to hang out with his friends on the church quiz team. His knowledge of popular culture lets him down, but he's a shoo-in when it comes to the maths questions. "I do love numbers," he says. "It isn't only an intellectual or aloof thing that I do. I really feel that there is an emotional attachment, a caring for numbers. I think this is a human thing—in the same way that a poet humanises a river or a tree through metaphor, my world gives me a sense of numbers as personal. It sounds silly, but numbers are my friends."

[1]**mathematical constant:** a special number that is usually a real number and is considered "significantly interesting in some way"
[2]**adjudicator:** a judge or arbitrator, especially in a dispute or competition
[3]**epileptic fit:** (also referred to as an epileptic seizure) a brief symptom of epilepsy which may include loss of consciousness, convulsions, or losing muscle tone and slumping to the ground

MAIN IDEAS

Many articles and textbooks contain paragraph headers. A paragraph header is like a title for the paragraph. It tells readers what they can expect to read about. Choose the best paragraph headers for each of the following sections in the article.

1. *For paragraphs 1 and 2:*
   - **a.** Daniel Tammet—mathematical genius
   - **b.** Daniel Tammet's abilities and disabilities
   - **c.** Math—how he does it
2. *For paragraphs 4 and 5:*
   - **a.** The autistic brain
   - **b.** Mänti—Daniel's language
   - **c.** Not the typical savant
3. *For paragraphs 7 and 8:*
   - **a.** Everyday life can be difficult
   - **b.** Overstimulation can be a problem
   - **c.** Daniel's daily routine
4. *For paragraphs 10 and 11:*
   - **a.** Kim Peek and Daniel's similarities
   - **b.** Kim Peek and Daniel's love of books
   - **c.** Daniel and Kim Peek connect
5. *For paragraphs 14 and 15:*
   - **a.** Daniel starts counting
   - **b.** Daniel's math skills emerge
   - **c.** Numbers as images
6. *For paragraphs 16 and 17:*
   - **a.** Daniel's love of singing
   - **b.** Daniel's shyness
   - **c.** Problems in school

DETAILS

Reading One gives information about Daniel's abilities and disabilities. Read the categories on the left in the chart below. Then write the details and examples from the box next to the appropriate categories. Finally, identify each detail or example as either an ability or a disability. Share your completed chart with a partner.

Daniel feels uncomfortable in the supermarket.	Daniel has invented his own language.	Daniel can calculate cube roots faster than a calculator.
Daniel can recall pi to 22,514 decimal points.	Daniel must drink his tea at exactly the same time every day.	It is hard for Daniel to socialize with anyone outside his family.
Daniel is able to read a lot of books.	Daniel has trouble making eye contact.	Daniel can multiply 377 × 795 in his head.
Daniel doesn't go to the beach because there are too many pebbles to count.	Daniel always has to brush his teeth before he showers.	The thought of a mathematical problem with no solution makes Daniel uncomfortable.
Daniel can easily remember key dates in history.	Daniel speaks seven languages.	

CATEGORY	DETAILS OR EXAMPLES	ABILITY	DISABILITY
MATH	1. *Daniel can calculate cube roots faster than a calculator.*	X	
	2.		
	3.		
	4.		
LANGUAGE	1. *Daniel has invented his own language.*	X	
	2.		
	3.		
MEMORY	1.		
	2.		
SOCIAL INTERACTION	1.		
	2.		
	3.		
NEED FOR ORDER	1.		
	2.		