The last word

My life as a Rain Man

Daniel Tammet is an autistic savant for whom math is an intensely cinematic experience. In his new memoir, he explains why 5 is a clap of thunder and 9 stands tall and blue.

I was born on Jan. 31, 1979—a Wednesday. I know it was a Wednesday, because the date is blue in my mind and Wednesdays are always blue, like the number 9 or the sound of loud voices arguing. I like my birth date, because of the way I'm able to visualize most of the numbers in it as smooth and round shapes, similar to pebbles on a beach. That's because they are prime numbers: 31, 19, 197, 97, 79, and 1979 are all divisible only by themselves and 1. I can recognize every prime up to 9,973 by their “pebble-like” quality. It's just the way my brain works.

I have a rare condition known as savant syndrome, little known before its portrayal by actor Dustin Hoffman in the Oscar-winning 1988 film Rain Man. Like Hoffman's character, Raymond Babbitt, I have an almost obsessive need for order and routine that affects virtually every aspect of my life.

For example, I eat exactly 45 grams of porridge for breakfast each morning at my home in Kent, England; I weigh the bowl with an electronic scale to make sure. Then I count the number of items of clothing I'm wearing before I leave my house. I get anxious if I can't drink my cups of tea at the same time each day. Whenever I become too stressed and can't breathe properly, I close my eyes and count. Thinking of numbers helps me to become calm again.

Numbers are my friends, and they are always around me. Each one is unique and has its own personality. The number 11 is friendly and 5 is loud, whereas 4 is both shy and quiet—it's my favorite number, perhaps because it reminds me of myself. Some are big—23, 667, 1,179—while others are small—6, 13, 581. Some are beautiful, like 333, and some are ugly, like 289. To me, every number is special.

No matter where I go or what I'm doing, numbers are never far from my thoughts. In an interview with talk show host David Letterman in New York, I told David he looked like the number 117—tall and lanky. Later outside, in the appropriately named Times Square, I gazed up at the towering skyscrapers and felt surrounded by 9s—the number I most associate with feelings of immensity.

Scientists call my visual, emotional experience of numbers synesthesia, a rare neurological mixing of the senses, which most commonly results in the ability to see alphabetical letters and/or numbers in color. Mine is an unusual and complex type, through which I see numbers as shapes, colors, textures, and motions. The number 1, for example, is a brilliant and bright white, like someone shining a flashlight into my eyes. Five is a clap of thunder or the sound of waves crashing against rocks. Thirty-seven is lumpy like porridge, while 89 reminds me of falling snow.

Using my synesthetic experiences since early childhood, I have grown up with the ability to handle and calculate huge numbers in my head without any conscious effort. My favorite kind of calculation is power multiplication—squaring and cubing for example. Squares are always symmetrical shapes in my mind, which makes them especially beautiful to me.

I never write anything down when I'm calculating, because I've always been able to do the sums in my head. When multiplying, I see the two numbers as distinct shapes. The image changes and a third shape emerges—the correct answer. When I divide one number by another, in my head I see a spiral rotating downwards in larger and larger loops, which seem to warp and curve.

Different divisions produce different sizes of spirals with varying curves. From my mental imagery I'm able to calculate a sum like $13 + 97 (0.1340206...)$ to almost a hundred decimal places.

Different tasks involve different shapes, and I also have various sensations or emotions for certain numbers. Whenever I multiply with 11, I always experience a feeling of the digits tumbling downwards in my head. I find 65 hardest to remember of all the numbers, because I experience them as tiny black dots, without any distinctive shape or texture. I would describe them as like little gaps or holes. I have visual and sometimes emotional responses to every number up to 10,000, like having my own visual, numerical vocabulary.

And just like a poet's choice of words, I find some combinations of numbers more beautiful than others: One goes well with darker numbers like 85 and 95, but not so well with 65. A telephone number with the sequence 189 is much more beautiful to me than one with a sequence like 116.

This aesthetic dimension to my synesthesia is something that has its ups and downs. If I see a number I experience as particularly beautiful on a shop sign or a car license plate, there's a shiver of excitement and pleasure. On the other hand, if the numbers don't match my experience of them—if, for example, a shop sign's price has "99 pence" in red or green (instead of blue)—then I find that uncomfortable and irritating.

It is not known how many savants have synesthetic experiences to help them in the areas they excel in. One reason for this is that, like Raymond Babbitt, many suffer profound disability, preventing them from explaining to others how they do the things that they do. I am fortunate not to suffer from any of the most severe impairments that often come with abilities such as mine.

Like most individuals with savant syndrome, I am also on the autistic spectrum. I have Asperger syndrome, a relatively mild and high-functioning form of autism. Emotions can be hard for me to understand or know how to react to, so I often use numbers to help me. If a friend says they feel sad or depressed, I picture myself sitting in the dark hollowness of number 6 to help me experience the same sort of feeling and understand it. If I read in an article that a person felt intimidated by something, I imagine myself standing next to the number 9. By doing this, numbers actually help me get closer to understanding other people.

Sometimes people meet for the first
The last word

often remember their name by the color of the word: Richards are red, Johns are yellow, and Henrys are blue.

It also helps me to learn other languages quickly and easily. I currently know 10 languages: English (my native language), Finnish, French, German, Lithuanian, Esperanto, Spanish, Romanian, Icelandic, and Welsh. Associating the different colors and emotions I experience for each word with its meaning helps bring the words to life. For example, the Finnish word *tuli* is orange to me and means "fire." When I read or think about the word I immediately see the color in my head, which evokes the meaning. Another example is the Welsh word *gweilo*, which is a green and dark blue color and means "sea." I think it is an extremely good word for describing the sea's colors.

When I was a child, doctors did not know about Asperger syndrome, and so for many years I grew up with no understanding of why I felt so different from my peers and apart from the world around me. I also remember spending hours as a young child looking at books after school in my local library, trying in vain to find one that had my name on it. Because there were so many books in the library, with so many different names on them, I assumed that one of them—somewhere—had to be mine. At the time I didn't understand that a person's name appears on a book because he or she wrote it. Eventually I learned better. If I ever was going to find my book, I was going to have to write it first.

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Some words are perfect for the things they describe. A "raspberry" is both a red word and a red fruit, while "grass" and "glass" are both green words that describe green things. Words beginning with the letter *T* are always orange like a tulip or a tiger or a tree in autumn, when the leaves turn to orange.

Contrary, some words do not seem to me to fit the things they describe: "Geese" is a green word but describes white birds ("hees" would seem a better choice to me), the word "white" is blue, while "orange" is clear and shiny like ice. "Four" is a blue word but a pointy number, at least to me. The color of "wine" (a blue word) is better described by the French word *vin*, which is purple.

Seeing words in different colors and textures aids my memory for facts and names. When I meet someone for the first time I remember their name by the color of the word: Richards are red, Johns are yellow, and Henrys are blue.

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