

The autism gene driving Elon and the rest of us on

Unconventional thinkers such as the Tesla boss, who has just revealed he is autistic, have turbocharged human evolution and ingenuity for 100,000 years, says *Simon Baron-Cohen*

Last weekend Elon Musk, the billionaire head of Tesla, announced during his slot hosting the American comedy show *Saturday Night Live* that he has Asperger syndrome. This came as no surprise to me. In my book *The Pattern Seekers*, I present evidence for a new theory that talented inventors often show a high number of autistic traits and that – despite this being a disability – the genes for autism have driven human progress for 100,000 years.

Anecdotally, Musk, 49, is in good company. Thomas Edison, who invented the electric lightbulb, questioned everything as a child, couldn't fit into mainstream school and became obsessed with his chemistry experiments and with Morse code, even naming his children Dot and Dash.

According to the Netflix documentary *Inside Bill's Brain: Decoding Bill Gates*, as a teenager Bill Gates struggled with social skills. Gates also speaks about knowing every car in the Microsoft office car park by its numberplate, so he could tell who was coming or going.

And the piano genius Glenn Gould would eat the same meal at the same time in the same diner each night, and had to have the same chair in each performance, wherever he performed.

Autism is diagnosed when a person has difficulties in social relationships and communication, and in adjusting to unexpected change. It also involves unusually narrow interests and a strong need for predictability, routine and repetition. Autistic people also have heightened attention to detail. Asperger syndrome was the term used for autism in individuals who have no learning difficulties or language delay – although the term is no longer officially used; we would simply say autistic. It is unclear if Musk's self-diagnosis would be confirmed by a clinician but self-diagnosis is increasingly seen as important, and a recognition that autism is a part of one's identity.

The uniquely human capacity for invention – one of the defining characteristics of our species and one of the reasons we dominate the planet – depends on the capacity to "systemise". This is the ability to analyse or build a system, and a system is nothing more than an "if-and-then" pattern. My theory proposes that a new circuit in the modern human brain, the systemising mechanism, evolved between 70,000 and 100,000 years ago.

We can infer the existence of the systemising mechanism from artefacts in the archaeological records. The first bow and arrow would have required the inventor to reason that *if I attach an arrow to a stretchy fibre and release the fibre, then the arrow will fly*. The earliest musical instrument, a 40,000-year-old bone flute, would also have required its inventor to use if-and-then reasoning: *if I blow down this hollow bone and cover one hole, then I produce a note*.

My group at Cambridge University's Autism Research Centre has gathered new evidence for the link between the autistic mind and strong systemising. In a sample of 600,000 people, we found those who work in Stem jobs – those relating to science, technology, engineering or mathematics – have a higher number of autistic traits than those who do not. If the link between systemising and autism is genetic, then autism should be more common in places such as Silicon Valley, where those with an aptitude for systemising flock to work, meet and raise families. We tested this prediction in

Eindhoven, the Silicon Valley of the Netherlands. Autism was more than twice as common there as in some other Dutch cities.

We then worked with the DNA-testing firm 23andMe and tested 50,000 people to see if there was an overlap between the common genetic variants associated with "hyper-systemising" and those associated with autism. Sure enough, there was. The overlap was 26 per cent. Some of the "autism" genes don't just provide the code for autism; they also code for the talent for systemising.

Twenty years ago I helped set up the Chitra Sethia Autism Centre in Cambridge, one of the first clinics in the world for adults with suspected autism who had missed out on a diagnosis in childhood. We call them the "lost generation". Many of them have underachieved academically and are unemployed. Unsurprisingly many of them have developed poor mental health, having been bullied at school for being different and have felt excluded by society.



Musk revealed that he has Asperger syndrome on *Saturday Night Live*

“People in Stem jobs often have autistic traits

But now schools and companies are recognising neurodiversity – the idea that brains come in many types. Richard Branson, who has dyslexia, invests in the IT consultancy Auticon, which employs only autistic people. GCHQ, the UK's signals intelligence service, actively encourages autistic people to help it crack codes in the fight against terrorism, cybercrime and espionage.

On Thursday night, Dara McAnulty, an autistic 17-year-old naturalist, won a book of the year prize at the British Book Awards. And at Harry Specters chocolaterie in Ely, Cambridgeshire, autistic people, some of whom have additional learning or language difficulties, devise recipes and make chocolates with exquisite precision.

We need to include, support and accept autistic people. My hope is that Musk will serve as a model and help remove the stigma. Exciting innovation is often the result when we give space and opportunity to people who are less interested in following the social norms and who instead think, "What if we took x and did y – then what would happen?"

Simon Baron-Cohen is a professor of developmental psychopathology and the director of the Autism Research Centre at Cambridge University. The Pattern Seekers: A New Theory of Human Invention is published by Penguin Random House

