

“Temple Grandin does not romanticize autism. If Temple is profoundly different from most of us, she is no less human for being so, but, rather, human in another way. Her book, *Thinking in Pictures*, is deeply moving and fascinating because it provides a bridge between our world and hers, and allows us a glimpse into a quite other sort of mind.” — Dr. Oliver Sacks

by Temple Grandin, Ph.D.

GENIUS may be an ABNORMALITY

I am becoming increasingly concerned that intellectually gifted children are being denied opportunities because they are being labeled as either Asperger's or high functioning autism. Before people knew about Asperger's Syndrome, many such children would have received the very positive label of intellectually gifted.

In the relationship of autism, those with Asperger's Syndrome have average — or even very high — IQs, while 70 percent of those with other autistic disorders suffer from mild to severe mental retardation. At the less fortunate end of the spectrum are what diagnosticians call “profoundly affected” children. If not forcibly engaged, these children spend their waking hours in trancelike states, staring at lights, rocking, making high-pitched squeaks and flapping their hands — repetitively stimulating (“stimming”) their mis-wired nervous systems.

It is likely that genius in any field is an abnormality. Children and adults who excel in one area, such as math, are often very poor in other areas. The abilities are very uneven.

Hans Asperger died in 1980 with the intuition that even certain gifted children might also be autistic. The term “Asperger Syndrome” was coined a year later by UK psychologist Lorna Wing. She described the disorder as a continuum that “ranges from the most profoundly physically and mentally retarded person... to the most able, highly intelligent person with social impairment in its subtlest form as his only disability. It overlaps with learning disabilities and shades into eccentric normality.”

Like most distinctions in the world of childhood developmental disorders, the line between classic autism and Asperger's Syndrome is hazy and shifts with the state of diagnostic opinion. Autism was added to the *American*

Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1980, but Asperger's Syndrome wasn't included as a separate disorder until the fourth edition in 1994. The taxonomy is further complicated by the fact that few if any people who have Asperger's will exhibit all of the behaviors listed in the *DSM-IV*. Though Asperger's Syndrome is less disabling than “low-functioning” forms of autism, kids who have it suffer difficulties in the same areas as those of classically autistic children: social interactions, motor skills, sensory processing and a tendency toward repetitive behavior.

Educating Students with Asperger's Syndrome or High Functioning Autism

It is essential that talented children labeled as having either high functioning autism or Asperger's be trained in fields such as computer programming, where they can do intellectually satisfying work. Because computers are logical, consistent and not prone to moods, teachers and parents will find computers effectively build on the natural strengths of autistic children — for instance, many teenagers who lack the motor skills to write by hand find it easier to use a keyboard.

Continuum of Traits

There is a continuum of personality and intellectual traits from normal to abnormal. At what point does a brilliant computer programmer or engineer get labeled with Asperger's Syndrome, or “the engineers' disorder”? Simon Baron-Cohen, an autism researcher at the University of Cambridge, found that there were two times as many engineers in the family history of people with autism. I certainly fit this pattern. My grandfather was an engineer who was co-inventor of the automatic pilot for an airplane. An article in *Time Magazine* once compared me to Bill Gates as both displaying traits of Asperger's Syndrome — for example, we both rock. Bill Gates' single-minded focus

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Autistic Disorder: Sometimes referred to as early infantile autism, childhood autism or Kanner's autism. The essential features of Autistic Disorder are the presence of markedly abnormal or impaired development in social interaction and communication. The impairment in communication is also marked and sustained, affecting both verbal and nonverbal skills. These individuals have restricted, repetitive and stereotyped patterns of behavior, interests and activities. (DSM-IV)

Asperger's Syndrome: These children lack basic social and motor skills, seem unable to decode body language or sense the feelings of others, avoid eye contact and frequently launch into monologues about narrowly defined — and often highly technical — interests. Even when very young, these children become obsessed with order and fly into tantrums when their routines are disturbed. In contrast to Autistic Disorder, there are no clinically significant delays in language. (DSM-IV)

on technical minutiae, rocking motions and flat tone of voice are all suggestive of an adult with some trace of the disorder.

There is also evidence that high functioning autism and Asperger's Syndrome have a strong genetic basis. G.R. DeLong and J.T. Dyer found that two thirds of families with a high functioning autistic had either a first or second degree relative with Asperger's Syndrome. Dr. Robert Plomin at Pennsylvania State University states that autism is highly heritable.

Is Genius an Abnormality?

Albert Einstein himself had many autistic traits. He did not learn to speak until he was three years old, and he had a lack of concern about his appearance. His uncut hair did not match the men's hairstyles of his time. Einstein was a poor speller and did poorly in foreign language. The brilliant physicist Richard Feynman also did poorly in some subjects.

A review of the literature indicates that being truly outstanding in any field may be associated with some type of abnormality. Kay Redfield Jamison of the Johns Hopkins School of Medicine has reviewed many studies that show a link between manic depressive illness and creativity. An article in the December 2001 issue of *Wired Magazine* discussed the link between the disorders of autism and Asperger's and the professions of engineering and computer programming. The article stated that the incidence of autism and Asperger's is higher in the children of technology company employees. This supports the idea that a little bit of autism genes may provide an intellectual advantage, while too much of the gene may cause a severe case of autism.

Types of Thinking

There appear to be two basic types of thinking in intellectually gifted people who have Asperger's or high functioning autism. The two types are totally visual thinkers, like me, and music, math and memory thinkers, such as those described in Thomas Sowell's book, *Late Talking Children*. Sowell reports that in the family histories of late talking, music math and memory children, 74 percent of the families will have a relative who is an engineer or who is employed in another highly technical field such as physics, accounting or mathematics.

Totally Visual Thinking

When I think about a dog, I see pictures of specific dogs in my mind. There is no verbal concept of a dog in my mind. My thought process goes from specific pictures to general concepts, where as most people think from general to specific. I have no vague, abstract, language-based concepts in my head — only specific pictures. This is totally visual thinking.

When I do equipment design work, I'm able to view three-dimensional, full motion "images" in my head. This allows me to "test run" the equipment within the "virtual reality" of my imagination. Visual thinkers who are expert computer programmers have told me that they can see the

entire program "tree" in their mind before they even write the first "branch" of code.

For a visual thinker, it is as if there are two consciences. Pictures are the real thoughts, while language acts as a narrator — there is no subconscious. Images are constantly passing through the computer screen of my imagination — allowing me to "see" thought processes that others have covered up with language.

Another aspect of visual thinking is the ability to "assemble" mental pieces into a new whole. It is like taking things out of the memory of a CAD computer drafting system and re-assembling them into a new, three-dimensional image. Constance Mibrath and Bryan Siegal at the University of California found that talented, autistic artists assemble the whole from the parts. They described this phenomenon as "bottom up thinking," as opposed to the more typical "top down thinking."

Teachers and Mentors

Children and teenagers with autism or Asperger's Syndrome need teachers who can help them develop their talents. I cannot emphasize enough the importance of developing a talent into an employable skill. Visual thinkers can become experts in fields such as computer graphics, drafting, computer programming, automotive repair, commercial art, industrial equipment design or working with animals. The music, math and memory type of children can excel in mathematics, accounting, engineering, physics, music, translating engineering and legal documents and other technical skills.

Since social skills are often weak, the person must make up for this by becoming so good at something that people will hire him or her. Teachers need to council these individuals to enter fields where they can easily gain employment.

Rates of both classic autism and Asperger's Syndrome are going up all over the world, which is certainly cause for alarm and for the urgent mobilization of research. Autism was once considered a very rare disorder, occurring in one out of every 10,000 births — now it's understood to be much more common

Although there is still no known cause, no miracle drug and no cure, the last twenty years have yielded significant advances in developing methods of behavioral training that help autistic children find ways to communicate. These techniques, however, require prodigious amounts of persistence, time, money and love. ▼

Dr. Temple Grandin has a Ph.D. in animal science from the University of Illinois and has designed one-third of all the livestock handling facilities in the United States and many in other countries. She is the author of *Thinking in Pictures* (Doubleday 1995), which is the result of Dr. Grandin's persistent effort and determination to find answers for herself and others who share this same ability. Dr. Grandin is currently an assistant professor of animal sciences at Colorado State University and a frequent lecturer at autism meetings throughout the country. She may be contacted at (970) 229-0703.

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