

Autism and the Artistic Imagination: The Link Between Visual Thinking and Intelligence

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Abstract

The author employs Howard Gardner's Theory of Multiple Intelligences to frame a discussion about the abilities of children on the Autism spectrum. Since children possess special gifts in visual/spatial areas, an argument is made to support this ability instead of "correcting" it into a more "normal" range. References from Dr. Temple Grandin's life are included. Dr. Grandin is an adult with Autism who is living a successful productive life as an Associate Professor of Animal Science at Colorado State University. Since Howard Gardner discovered that there are several ways to be considered intelligent, the author makes a case for celebrating the differences and special contributions autistic individuals can make to society, even as these individuals must learn social and coping skills, without trying to cure these differences.

Keywords

Autism, visual thinking, spacial, intelligence

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It seems that everywhere you look lately, whether it is books, television, magazines, newspapers, Autism and related disorders command the headlines. According to NIH, there has been an increase in true diagnosis of Autism of about 30-60 per 10,000 population, up dramatically from the figure 40 years ago of four per 10,000 (Rutter, 2005). Everything from immunizations, allergies, genetics, and intestinal problems have been blamed for the rise. Complications also occur when doctors diagnose kids with Autism when they have another related disorder. This can happen when a diagnosis is attached to funding involved for treatment, or to placate parents who won't leave without a definite answer from the doctor. For whatever reason, the numbers have skyrocketed. But if true Autism accounts for a small number of recently diagnosed cases, what exactly do the others entail, and must it always have a negative connotation? In other words, do the characteristics of many Autism related disorders have to be a bad thing?

My perspective on this issue is two-fold; as an educator who does research in the field of intelligence, studying various educational topics and problems, and as the parent of a toddler recently diagnosed with Communication Disorder, one of the pervasive development disorders under the umbrella term "Autism". These disorders like many, occur on a spectrum of severity, from mild high achievers to severely disabled.

I began my journey into Autism fairly recently, but I have always been fascinated with how seemingly unrelated concepts can be connected, which would be a significant tool in my Autism research. Six years ago, I wrote a piece entitled "Multiple Intelligences and the Artistic Imagination: A Case Study of Einstein and Picasso" (Newbold, 1999). In this article, I argued that Einstein and Picasso

had similar thought processes, even though one was a scientist and mathematician, (so-called "left brain" person) and the other was an artist, (or "right-brain" person). These two abilities are thought to be at the opposite ends of the spectrum, but my point was that they had similar thought processes. At about the same time this article came to print, and in some cases during, many others had written about the very same phenomena, including the comedian/writer Steve Martin in his hysterically funny play "Picasso at the Lapin Agile" (Martin, 1996). I became aware of his play after beginning work on my article, so some of us were getting the same idea at the same time.

Since then, I have remarried and given birth to a little boy who is four and a half at this writing. He is a charming, funny, affectionate and playful little chap, and also happens to be a late-talker. When he approached his second birthday, his father and I became concerned when he didn't seem to be acquiring the language appropriate for his age, so we started him in speech therapy and had his hearing tested. After our move to New York, he was still cheerful and curious, and could understand what we told him, but was still lagging far behind verbally and socially, so we had him evaluated by a pediatric neurologist and another team of experts. The neurologist told us that he didn't fit into the Autism category. The other team told us that they were hesitant to apply this label, but that he could fit under the "Autism spectrum" umbrella of PDD-NOS, which stands for pervasive development disorder, not otherwise specified. The mere term "Pervasive Development Disorder" strikes fear into the hearts of parents who hear a doctor speak those words. For most, it is the first time they have ever heard the term. This term in effect means that he shows some of the signs of mild

Autism, but not others, since he is affectionate, has good eye contact, and goes to us and others for comfort, with his main difficulty being his speech delay and the problems that was causing. Their term for him was “atypically atypical”! His most recent diagnosis, from an Autism specialist, was that he did not even have Autism, but a communication disorder, which can mimic Autistic symptoms until the communication becomes better. This diagnosis can throw parents into panic if they don’t know all the facts. Needless to say, his father and I were confused and decided to do what we do with most problems and what we do for a living...research it ourselves.

Pervasive development disorder - not otherwise specified (PDD-NOS) is actually a term used by the medical community to denote a range of disabilities that are not thought of as classic Autism. While the term is reserved for cases where everything else has been formally ruled out, something remains wrong, and PDD-NOS is contained in the “Autism spectrum” because it is thought to be a form of or related to Autism in some way. PDD-NOS is itself considered a spectral disability, adding to the confusion yet again.

Being an educator and researcher by nature, I so began my newest quest into PDD-NOS and Autism-related material. The more I read, some material written by doctors, some by Autistic grownups who had overcome their handicaps to some degree or another, the more I began to see this disability in a new way. It was then that I stumbled onto the writings of Dr. Temple Grandin, who is the foremost authority in the country on humane animal science. She is a livestock handling designer and Associate Professor of animal science at Colorado State University, who developed a revolutionary system of handling and transport of cattle either on their way to see a veterinarian, or to slaughter, which fo-

cuses on humane handling and reduced pain and fear for the cattle. No one in the country ever thought of this before Dr. Grandin. Facilities she has designed are located across the world, and almost half the cattle in North America are handled in a center track restrainer system she designed for meat plants (Grandin, <http://www.grandin.com/>). She is also Autistic.

Temple Grandin’s story begins as a little girl, where she says that she didn’t talk until she was three and a half years old, and communicated by screaming and humming. Her parents were instructed to put her away into an asylum, but she was instead sent to a series of private schools, finally majoring in experimental psychology and obtaining masters and doctorate degrees in animal science (Encyclopedia Britannica Online, 1999). As a teenager, she became aware of feelings of increased anxiety, and devised a system to alleviate it. It became known as “the squeeze machine.” She modeled it on a chute fashioned to hold animals in place during branding and other procedures (Encyclopedia Britannica Online, 1999). The squeeze machine applied pressure to her body, and the feeling of pressure and tightness comforted her anxiety symptoms. The alleviation of her anxiety compelled her to try to design a system that would reduce fear in cattle as they were led to slaughter. She credits this talent to her astonishing ability to see in pictures.

Dr. Grandin describes the ability herself:

One of the most profound mysteries of Autism has been the remarkable ability of most Autistic people to excel at visual spatial skills while performing so poorly at verbal skills. When I was a child and a teenager, I thought everybody thought in pictures. I had no idea that my thought

processes were different. In fact, I did not realize the full extent of the differences until very recently. At meetings and at work I started asking other people detailed questions about how they accessed information from their memories. From their answers I learned that my visualization skills far exceeded those of most other people” (Grandin, <http://www.grandin.com/>).

This was an excerpt from her book, *Thinking in Pictures* which she wrote in 1995, in which she describes how she can learn nothing that is language based. She converts things in her mind to images in order to understand them. She performed this mental exercise throughout school and even through college. This visual thinking has helped her enormously in her development of designs for the livestock industry. Visual thinking is also one of Howard Gardner’s “Multiple Intelligences” (Gardner, 1993). This form of intelligence, which Gardner calls “spatial,” enables a person to base his or her method of learning on visual thinking instead of language-based thinking. According to Grandin,

I think in pictures. Words are like a second language to me. I translate both spoken and written words into full-color movies, complete with sound, which run like a VCR tape in my head. When somebody speaks to me, his words are instantly translated into pictures. Language-based thinkers often find this phenomenon difficult to understand, but in my job as an equipment designer for the livestock industry, visual thinking is a tremendous advantage” (Grandin, <http://www.grandin.com/>).

Indeed, many parents of kids with Autism know very well that the only way they became potty trained was through pic-

ture related promptings. Visual learning is how they make sense of the world.

It is fascinating to read of her accounts of how she discovered what scared cows on their way to slaughter...the edge of shadow, certain bright lights, that no one up until then had thought or cared about. She discovered this and other amazing things by bending down and traveling through the chutes to see the world through a cow’s eyes. It was during college that she began to realize that she thought differently than other people. She remembers reading an article by a famous scientist that stated that early humans had to have invented language before they could develop tools. Grandin was amazed at the ignorance of this statement; she had never used language in the development of all of her inventions, yet here was a scholar in the field stating it as if it were fact.

Many people who study kids with Autism think that they lack an imagination. Indeed, supposedly one of the “symptoms” of Autism is that children show no interest in imaginary play. This is inaccurate. According to Grandin, her whole method of assembly and “dry-runs” of her inventions are carried out via her imagination.

Today, everyone is excited about the new virtual reality computer systems in which the user wears special goggles and is fully immersed in video game action. To me, these systems are like crude cartoons. My imagination works like the computer graphics programs that created the lifelike dinosaurs in Jurassic Park. When I do an equipment simulation in my imagination or work on an engineering problem, it is like seeing it on a videotape in my mind. I can view it from any angle, placing myself above or below the equipment and rotating it

at the same time. I don't need a fancy graphics program that can produce three-dimensional design simulations. I can do it better and faster in my head" (Grandin, <http://www.grandin.com/>).

Now, Albert Einstein is my all-time hero, and he was the main reason I wrote my previously mentioned paper. But arguments can be made that he too, was on the "autistic spectrum," albeit a high-functioning member of that group. Einstein developed his theories for relativity as a child by visualizing himself riding a beam of light. His theories were developed as complete whole insights, and details were worked out later. Indeed, Einstein's strength was his ability to visualize problems. His famous "Gedanken" thought experiment of the twins paradox that describes how traveling near the speed of light can slow time down so a person won't age, came about as a visualization. His visualizations were amazing because he could "see" whole complete theories in his head, much as Dr. Grandin does. One of the startling discoveries one can have of Einstein is that he failed many math courses and found them dry and boring. He was also a poor speller and equally poor in foreign language. This was my defense for my proposition that Einstein thought like an artist instead of a mathematician.

Thomas Sowell has written two of my favorite books on late talking children, one entitled *Late-Talking Children* appropriately enough, and the sequel, *The Einstein Syndrome: Bright Children who Talk Late*. In both of these books, Dr. Sowell speaks from experience of his now college educated son who at age three couldn't talk and who other people labeled as retarded. Sowell knew his son was bright though, and finally, right before he turned four, he started to speak in sentences. Now his son has a degree in statistics

and creates his own computer games. The book is entitled "The Einstein Syndrome" because of the reference to Einstein's late speech development. Indeed, three of the people responsible for the atomic bomb, were very late talkers, including Einstein, Edwin Teller, and Richard Feynman (Sowell, 2001). While I hope my son falls in this category of outcomes in late talking children, no one really knows what the future will hold. Many kids with Autism do have limits in cognitive ability, while many do not, and are in fact gifted in one way or another. Those labeled PDD-NOS are less likely to have mental deficits than those labeled as classically autistic. The question arises, at what level can high intelligence be thought of as abnormal?

In one of Grandin's most interesting articles, "Genius may be an Abnormality," she writes that genius in any field may be an abnormal state. There are two-times as many engineers and computer programmers in the family history of people with Autism than those without, and Grandin is no exception. Her grandfather was an engineer and co-invented the automatic pilot for the airplane. She contends that a little bit of Autism genes provide an intellectual advantage, while too much may cause severe impairment (Grandin, 2003).

So, as time goes by, in terms of Einstein, theories of spatial ability fueling the greatest mind known to science, are confirmed and strengthened. Can this "top-down" thinking really be the secret behind the greatest inventions and discoveries of our time? Can the ability to see the whole, complete vision first while plugging in details later, equip someone with the talent to solve problems most of us can only wring our hands over?

Another subject of my intellectual admiration is a professor of physics and mathematics at Columbia University, Brian

Greene. Dr. Greene has given the general populace the gifts of his two books, *The Elegant Universe*, and *The Fabric of the Cosmos: Space, Time and the Texture of Reality*. In both of these books, Dr. Greene uses visual prompts and drawings to help us understand the newest attempt to incorporate quantum mechanics into Einstein's theory of relativity with string theory (or super-string theory). While not the inventor of this theory, he has brought it to the world's attention, with mesmerizing specials on PBS, books and videos describing in amazing visual graphics, the tenets of string theory. Greene uses visual images, with little math to frighten off the person learning these theories for the first time.

Now, Brian Greene is not in any stretch autistic, but he possesses the gift for visualization, which is extremely helpful for those of us who need to "see" something in order to understand it, especially complex concepts, if only in our minds. Dr. Greene remembers a game he and his father played as a child. While walking the streets of the upper west side in New York City, his father would ask Brian how the flag pole jutting out from a building overhead must look to the ant climbing on it. Instead of appearing as a straight horizontal line to those down on the street, the ant experienced the pole in many more dimensions as the observers on the street...not only as a straight line, but as a circular object as well. These mental exercises helped develop one of the greatest physicists of our day. Dr. Greene is a rarity in the science field; a mathematician and scientist who is highly verbal and analytical at the same time, hence the popularity of his books.

What does Brian Greene have to do with children who may be autistic? I believe that there is a link between visual thinking and intelligence, and autistic or not, people like Dr. Greene and Temple Grandin have this

type of intelligence in common, thereby supporting some theories that certain forms of Autism are nothing less than outliers of genius, as Grandin mentions in her article. Most people on the Autism spectrum are visual thinkers. In many cases, augmented communication can help autistic individuals when nothing else could. Toilet training picture cards have helped many autistic children potty train because they understand the pictures before they understand the words involved with potty training. It is a different way of thinking and processing information, but it adds a unique viewpoint and one that contributes to our understanding of the world, rather than detracts from it. Visual intelligence is an enormously important talent, and it needs to be cultivated in those who possess it, autistic or not. It is an unusual and valuable form of intelligence, no matter who possesses it.

When I wrote "Multiple Intelligences and the Artistic Imagination: A Case Study of Einstein and Picasso" back in 1999, I had no idea of the avalanche of scientific evidence that was soon to come to support my theory. I also had no idea that I would give birth to a child that would change the way I view the world and make me delve deeper into intellectual differences and learning styles.

In our growing understanding of Autism and spectrum disorders, if we look at them as something to cure, we will miss the point. Grandin points out that children with these disorders need therapy to pull themselves out of their world into the outside world of interaction. She encourages those with Autism to pursue jobs that have nothing to do with Autism, to exercise those parts of the brain that force one to function in the world. She also says that speech, behavioral, and occupational therapy are necessary to focus them but not to "cure" them, because to

do so would be to commit a kind of genocide against a culture of people that may be in possession of gifts that could literally, change the way everyone views the world, whether it's revolutionary advances in bovine science, or space and time. Maybe even our definition of reality.

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