The Gift of Autism

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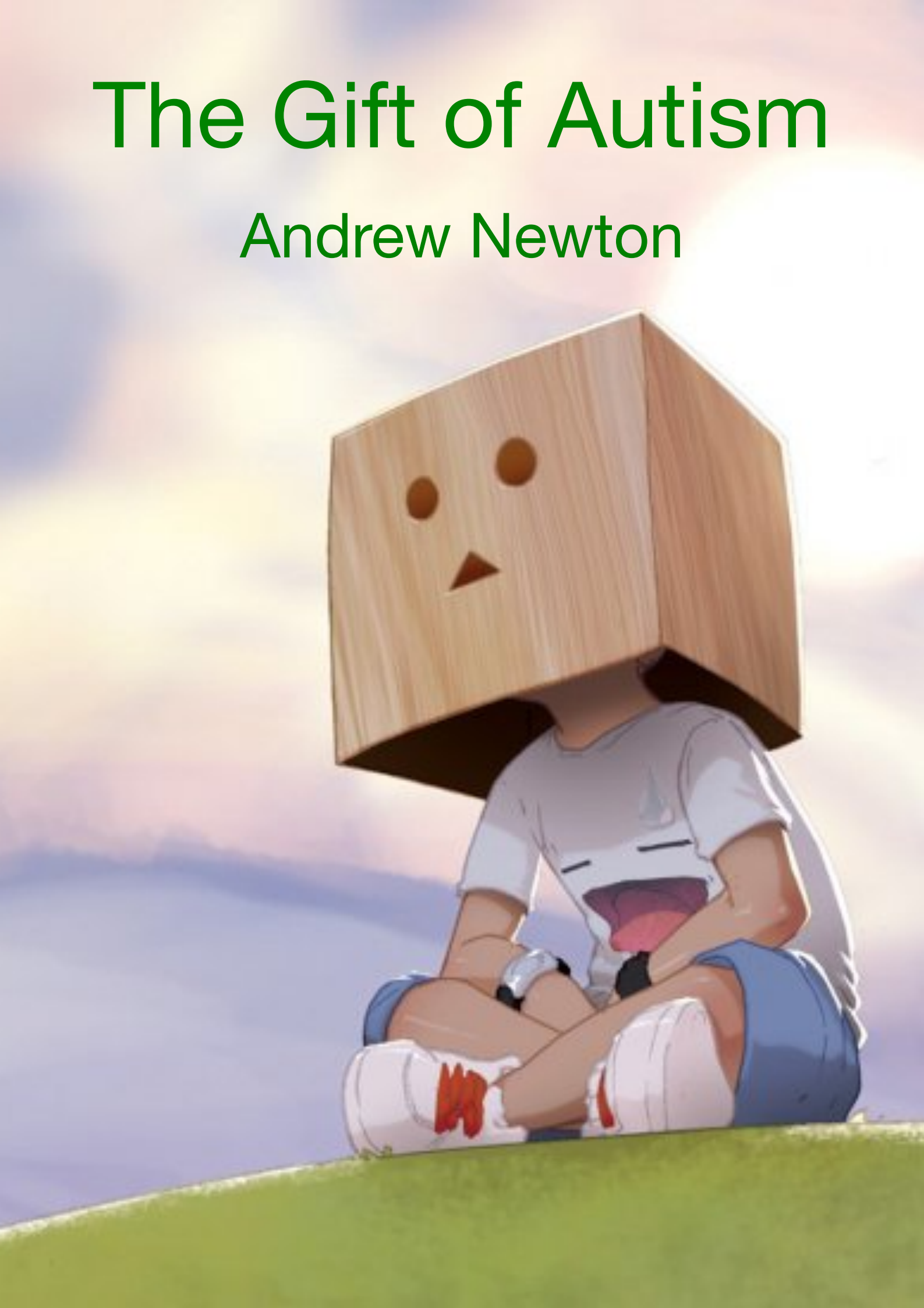

The Gift of Autism

Autism can bestow amazing talent the rest of us will never have…

Everyone – every human being on the planet – resides somewhere on the autism spectrum.

Autism is a lifelong developmental condition that affects how a person communicates with, and relates to other people. It often affects how those with the condition perceive and make sense of the world around them. Autistics can be both over-sensitive and under-sensitive to all the senses – sounds, touch, tastes, smells, light or colours, meaning their experiences of every facet of life can differ markedly from our own.

People high on the autism spectrum have difficulty with social, emotional and the kind of communication skills that usually develop before the age of three and last throughout a person's life.

Specific signs of autism to look out for include:

- Unusual reactions to smell, taste, sound, appearance, or touch
- Difficulty adapting to changes in routine
- Unable to repeat or echo what is said to them
- Difficulty expressing desires using words or motions
- Unable to discuss their own feelings or other people's
- Difficulty with acts of affection like hugging
- Prefer to be alone and avoid eye contact
- Difficulty relating to other people
- Unable to point at objects or look at objects when others point to them.

This might also be why, because they see the world in a different way, they think about problems in a different way, often finding 'outside the box' solutions that elude the rest of us.

The principal signs of Autism Spectrum Disorder (ASD) might not always be obvious. For example, attention to detail may be a sign of autism even though a lot of people pay attention to detail and would certainly not be diagnosed as autistic. The same could be said for perfectionists, people obsessed with cleanliness or people who are happier in their own company. It is only those with the most severe symptoms who are officially diagnosed with ASD.

People assume autistics are not good learners but this is a mistaken belief – people with autism are often voracious consumers of knowledge. Forget the stereotypical and nerdy Sheldon in *The Big Bang Theory* because autistics excel at a limitless variety of subjects, not just maths and science. People with autism know how to be social – it's just that they find it more difficult. Most autistics wish people understood their genuine dislike of being touched instead of dismissing them as being rude or odd. But that doesn't mean they don't care about other people or don't try to understand them. In truth, they try hard to understand other people.

They can take forever to get a joke – things that are interesting or fun to you and me utterly boring to them and vice versa. But people with autism are not always hopeless when it comes to social interaction – in fact many of them have learned ways of hiding their social awkwardness and learned how to interact socially simply by copying others without understanding the emotional constituent of such interaction.

Mozart was autistic. His remarkable, almost obsessive attention to musical perfection holds musicians in awe of his genius. So, according to psychologists at Oxford and Cambridge, was Albert Einstein. His childhood learning difficulties and tendency in adulthood to repeat phrases and sentences are a dead giveaway, although unusually, he also had a sense of humour. But his autism was also his genius. Einstein's General Theory of Relativity was an astonishing piece of original thinking that revolutionised science and still remains unchallenged today.

And then there's my namesake, Sir Isaac Newton. His limited social connections and difficulty with speech are indicators of autism, not to mention his habit of lecturing to empty rooms if people turned up late – typical autistic behaviour! Likewise, Thomas Jefferson's preoccupation with minority special interests. His social awkwardness and poor communication skills were also typical of autism. And there's Charles Darwin, whose single-minded focus and persistence with evolutionary theory occupied his entire life.

Temple Grandin, one of the world's leading psychologists and inventor of a humane system of shepherding cattle is one of the world's most famous living autistics. Add to the list film directors Stanley Kubric and Tim Burton, artist Andy Warhol, author Lewis Carroll and you begin to get the picture – another marker for autism is… genius.

A Yale University study found that the same genes responsible for higher intellectual achievement and exceptional brainpower are associated with, and may trigger autism, and may explain why autism has not been eliminated by natural selection. Genes that exert a negative effect on reproductive success normally die out, but a variety of genes known to boost brain growth are, in most cases, beneficial and that is why they continue to be passed on. But the downside is that the same genes increase the chances of putting their owner on the spectrum.

The Yale researchers used a computer model to simulate the effects of natural selection on different sets of genes. They concluded that the genetic variants found in people with autism were present at a much higher level than could be the result of chance. It appears that the genes have a 'signature for positive selection' that strongly suggests that these variants have undergone positive selection during the course of human evolutionary history.

So why are such a large number of gene variants that together give rise to traits like ASD retained in human populations, and why aren't they eliminated by evolution?

The answer is, during evolution, variants that have positive effects on cognitive function are selected, but at a cost – in this case an increased risk of ASD. Thus, there are many overlaps between autism and high IQ. These include having a larger brain, faster brain growth, increased visual, sensory and spatial abilities, increased attention focus, and are often descendant from a higher socio-economic background. Other studies have also shown that the risk of autism is higher in people who were highly intelligent as children and those who spent longer in education. The Yale research was the first to show that the genes linked to higher IQ and autism are being positively selected in evolution.

The gene variants boosting brain function did so in small, subtle ways because genes having a 'large effect' on the development of the nervous system would be extremely damaging, leading to disabilities or death. Thus they would be rapidly be eliminated from the human gene pool. An accumulation of lots of small beneficial modifications to the brain would be beneficial to most but detrimental to some. The Yale study was published *PLOS Genetics* and involved more than 5,000 people.

Autism should be treasured as a special and precious gift, a unique talent that can benefit humanity and enrich all our lives. ASD affects around one in 100 people. Whenever I speak about autism I refuse to use the word 'disorder' because I prefer to persuade those that don't understand the condition, or recognise the amazing contribution autism can make to humanity. 'Sufferers' of autism only suffer because of other's lack of tolerance. *We're all different – get used to it!* Autisitcs would be much happier if only people would stop trying to force them to be 'normal', or worse, 'cure' them!

I've met people with autism and they are very nice. Quite often, you'd never know they had it until you really get to know them and started to spot patterns of behaviour which might seem a bit unusual… but not *bad*.

A friend of mine runs a successful taxi business in Wellington, New Zealand but is a stickler for cleanliness and smartness. He also complains if his delivered pizza hasn't got the correct amount of toppings. 'Would you be happy if that was yours?' is one of his favourite phrases. So he's a bit OCD… so what? He knows what he wants and has a right to expect what he paid for… he's just a bit… well… you know… autistic. We joke about his OCD and then I remember I too have similar minor obsessions with perfection.

The number of computer geniuses who suffer from autism is beyond counting – Silicon Valley is full of them. They're the nerds who are happy performing repetitive tasks, which is one of the things that makes them good programmers. They fall in love with and marry other nerds and have nerdy children who will eventually inherit the earth. Then there are the ones who get more of a thrill solving a complex mathematical formula (something they regard as a thing of beauty) than they would going to a football match, which they find tediously boring, as again do I.

The world is full of people with their own harmless quirks, and I understand this, because I'm one of them. For me, lateness is the ultimate sin – punctuality the one true religion. Show me a talented individual and I'll show you someone who isn't completely normal!

With that in mind, it will come as no surprise that I do not consider autism to be a disability or a 'condition' – rather, I consider it a gift – a God-given precious gift. The problem is that the gift is too often overlooked and there are too many people trying to cure it! At the risk of repeating myself, we really are all different; it's just that some of us are different in a different way. Autism is of value… because the autistic mind has already produced immense benefits for the rest of us.

ASD can be the cause of a wide range of symptoms that are usually grouped into two main categories.

Autistics frequently shy away from social interaction, preferring texting and email to face-to-face communication. They often have problems starting and becoming involved in conversations and have difficulties with empathy and being aware of other people's emotions, let alone understanding them. Rigid thought patterns are another symptom. Autistics prefer set routines and become upset if they are disrupted. Their thought patterns are repetitive and their behaviour is easy to predict.

Personally, I see no reason whatsoever why others should seek out a ‘cure’ for this harmless behaviour. In any event, it is incurable anyway. There are a wide range of educational and behavioural support schemes in place, but generally, autistics need a great deal of persuading to take part in them.

More males are diagnosed as autistic than females. There are subtle differences in the connections within the brains of autistic men and this could help explain why people with autism exhibit the symptoms they do. The bundles of nerves in the frontal lobe, which is involved in social interaction skills, appear different from those without the disorder. This means they were born with their brains wired that way and so just as we embrace cultural diversity so we should embrace thought diversity. We are all human beings, and we all have something to contribute. Autistics can contribute new skills and new ways of thinking that people without the condition cannot.

We often hear of scientists talking about ‘discoveries that could reverse the process’ or who talk about autism as a disability. This attitude is just another sort of prejudice, or worse, fascist thinking. The last thing we need is a civilisation made up of identical mindless drones!

Scientists from the Universities of Bristol, Harvard, MIT and Massachusetts General Hospital set out to identify if there is a genetic relationship between ASD and ASD-related traits in people not considered to have ASD. Their findings have revealed underlying ASD affects a range of behavioural and developmental traits in ALL people. Their work was published in the journal, *Nature Genetics*.

Difficulties with social interaction, communication and language impairments, and stereotyped and repetitive behaviour are symptoms occurring to varying degrees in the general population anyway. With recent advances in genome sequencing and analysis, a more accurate picture of the genetic landscape of ASD is emerging.

It’s easy to think that autistics are being shy or indifferent, or that it’s a sign of social awkwardness, but people with autism often avoid eye contact, and some complain making eye contact ‘feels like burning.’

Researchers at the Massachusetts General Hospital used brain scans of autistic patients to investigate their complaints that eye contact is stressful and uncomfortable. Humans are drawn to the eyes of the human face from birth and this eye contact activates the subcortical system of the brain. But in autistic people, this region is oversensitive to the effects of direct gaze and emotional expression. The scientists found that eye contact over-stimulates autistic people’s brains and now understand that the lack of interpersonal interest among people with autism is not due to a lack of concern, but a way to decrease an unpleasant excessive arousal stemming from over-activation of the subcortical system.

The scientists measured differences in activation within the face-processing components of the subcortical system in autistic people and in non-autistic control subjects as they viewed faces either freely or when directed to look just at the eyes. Autistic people had similar results to non-autistic people when allowed to look freely at the faces, but when they were instructed to concentrate on the eyes, brain scans showed the autistic participant’s brains were activated to a much greater degree. Although this was especially true with fearful faces, similar effects were observed when viewing happy, angry and neutral faces. The researchers say their findings – published in the journal *Scientific Reports* – support the idea that there is an imbalance between the brain's excitatory network, which reacts to stimulation, and the inhibitory network, which calms it down.

Forcing children with autism to look into someone's eyes in behavioural therapy may create a lot of anxiety for them. Possibly a slow introduction to eye contact may help them overcome this overreaction and teach them how to handle eye contact and so avoid the cascading effect this eye-avoidance has on the development of the social brain. Research has shown that most ASD risk is polygenic – that is, it stems from the combined effects of thousands of genetic differences. Some cases are also linked to be new rare genetic variants or mutations rather than inherited.

What all this means is that autism is not a condition that can be 'cured.' It cannot be dealt with – and should not be dealt with – in the same way as mental illness. It's one thing to attempt to understand the causes of a condition, but quite another to attempt to contain or curtail its effects.

Autistics have a rich and valuable history of contributing to arts and science. They should be encouraged to continue to do so and not stymied or forced into programmes designed to change them. Autistic people are nice people and they have a lot to offer, and it's about time we cut them a bit more slack.

As the study of autism and diagnostic techniques become more specialised, we are beginning to move further away from the old (and mistaken) stereotypes and toward a better understanding of the potential and value of autistic individuals. Specialists in autism have found that not only do autistics possess widely different levels of cognitive skills, they can also possess above-average intelligence.

The truth is, people with autism can be just as empathic and emotionally competent as the rest of us – it's the psychopaths we should be worrying about!

Like the rest of us, autistics enjoy feeling happy and content. They are also capable of feeling anger and frustration, and like all other humans, occasionally they throw tantrums. However, their inability to recognise emotions in others and the difficulty they have describing their own thoughts and feelings is actually caused by another condition – Alexithymia – a condition *also found in the rest of the population,* although it is more common in autistics.

But not all autistics have alexithymia. Only about half of autistic people are cold or antisocial or disinterested in others. For those with alexithymia, there is a deficit of empathy and a difficulty understanding the emotions of others.

According to researchers at the International School for Advanced Studies (SISSA) in Italy and the University of Vienna, and published in the journal *Scientific Reports*, autistic people also have a greater tendency to avoid causing harm to others than those without the condition.

The researchers subjected autistic people who had high IQ's to a series of moral dilemmas, that is, hypothetical situations where a decision had to be made which could save the lives of some individuals by sacrificing others. Participants were asked to choose between doing an action which caused the death of one person but saved the lives of a large number of others – or doing nothing… which meant not killing anyone directly, but resulted in the deaths of others.

A Spock-like cold logic would have encouraged a purely utilitarian decision based entirely on numbers. Conversely, an empathic attitude would prevent most people from choosing to kill voluntarily. The results were that people with alexithymia were more likely to choose the first option because of their reduced empathy. But those with only the autistic trait were less likely to choose that, due to the effect of increased personal distress.

Autistics display strong emotional stress in response to situations where the individual tends to avoid performing harmful actions. This work offers even more insight, if not absolute proof that people with autism are jest as caring and empathic as the rest of us.

We need to lose the *Rain Man* image of autism. The *Rain Man* image has become entrenched in modern culture, not just because of Dustin Hoffman's extreme portrayal of the character, but because autism is now typically thought of as a male problem when in fact it isn't.

[OK – of all the famous autistics I can name off the top of my head, and I have a special interest in this, Dr Temple Grandin is the only female with the condition I can think of.]

Autistics don't have the same social skills as most people – but so what? So what they don't go in for all the luvvie-luvvie, touchy-feely stuff that everyone seems to go in for while they infect each other with their hideous germs? This business of hugging everyone in sight, including complete strangers is a late 20th/early 21st century behaviour. It's an unnecessary fad anyway, so what's the problem?

It's because autistics think in different ways that many of them have extraordinarily high levels of intelligence and ability, especially in areas like music and science. We simply must lose the image of the 'nerdy' male, socially impaired and with strange and quirky special skills, because less than 1% of autistics (0.01% of all people) fall into that category.

Certainly males are more likely to be diagnosed as autistic than girls – somewhere between two and four times as likely. But there is increasing awareness that the apparent 'maleness' of autism may be more to do with the failure to recognise the condition in females who, at the less impaired end of Autism Spectrum Disorder manage to exist under the diagnostic radar. The female experience of autism is very different to the male experience.

It might of course be that the condition in females is ignored simply because of confirmation bias. Or more likely it could be because autism affects females in a different way, possibly because of biological differences, overlooked because of traditional male/female stereotyping. It could just be that the process of diagnosis itself is more geared toward males. It could even be because women have two X chromosomes and these reduce the impact of genetic factors that would inhibit the condition from showing up in tests. This would explain why [particularly young] girls diagnosed with ASD tend to be at the more extreme end of the spectrum.

A recent study of 10,000 fraternal twins showed that girls with ASD came from families with a much higher incidence of autism in other family members or relatives who showed evidence of autistic traits such as social awkwardness or obsessiveness.

One major problem highlighted by the study is that parents of girls on the spectrum told researchers that the examples given to help them answer questions about their offspring's unusual interests and obsessions are much more slanted towards 'boy-type' interests such as *'does your child have an unusual obsession with metal objects, lights or street signs?'* When in fact their daughter's obsession might be more to do with particular animals or dolls or pop stars.

One school of thought is that girls have a range of 'camouflaging' tactics, possibly because they may be more likely for cultural reasons to have been taught to be polite and decorous. Girls are perceived to be more sensitive than boys – they have a greater awareness of the importance of social rules and conformity, of being sensitive to others, or forming friendship networks. Girls are more likely to rely on the support of other girls

whereas boys don't, at least not emotionally. To conform to this ideal, girl's survival strategy is based more on learning to imitate expected behaviour.

This is a common theme among women on the spectrum who describe the exhausting process of continuously monitoring and copying the social interactions that appear instinctive to their peers. This behaviour is known as 'hiding in plain sight.' The National Autistic Society's *Autism in Pink* campaign has identified some key issues, and researchers are focusing on the dichotomy of female autism.

So there is increasing awareness that our current understanding of autism is glossing over girls who have the condition. This is an important discovery as it is commonly accepted that early identification and access to the right support services are important factors in including autistics in society, and more important, recognising and respecting them. Above all, autistic people are nice people. They are good people. All they want is for people to stop trying to change them! Imagine the outcry if the rest of us went round trying to change gay people! Autism is not any kind of mental illness – it should be accepted as something that just makes people a bit different, and interesting, and able to contribute to the rest of humanity in different ways. Diversity rules!

Most autistic children in Britain go to mainstream schools and academies, while some attend special schools. Almost half of all autistic children in England have been excluded from school at some time or another because teachers are unable to cope with their behaviour. In line with government guidelines, all exclusions must be formally recorded. Even so, around 20,000 children have been placed on reduced timetables, sent home early or told not to go into school on exam days or go on school trips. According to m'learned friends, these exclusions are illegal if imposed without the school providing the requisite paperwork – sending pupils home early or for a cooling-off period is deemed unlawful.

Ambitious About Autism is a charity dedicated to improving opportunities for young people on the spectrum in the UK. Having conducted a survey of 745 families with autistic children, the charity found they were four times more likely to be permanently excluded from school than other children. Nearly 25% of autistic children had been formally expelled at some point of their school careers.

The report also discovered that children with autism not only miss out on vital school time because of illegal exclusions, but these exclusions go unrecorded and unreported, so the scale of the problem is hidden, making it harder for families to ensure their children's rights. A staggering 33% of head teachers confirmed they knew at least one child with autism who had been excluded in any 12 month period. If children with autism had their needs met in school, these exclusions would be nowhere near this level.

Teachers are, in the main, unaware of the kind of problems children with autism suffer. Autistics have difficulties with social interaction and anxiety and may suffer with the sort of sensory processing problems described above. They may be disruptive, aggressive and unpredictable – even to themselves. They are more often than not unable to communicate these difficulties to the very people that should be lending a sympathetic ear. Some children escape by locking themselves in their own world.

The charity's report also stated that 75% of parents find it difficult to get the right support at school for their autistic child and that 80% of children with autism find school so stressful they experience anxiety about attending every day. More than half these children find this anxiety so debilitating that they miss school days anyway. It is unacceptable that children with autism are excluded and thus stigmatised. It is a fundamental right that children should be allowed to grow up happy and make the most of their education, and to

develop their skills to the benefit of everyone. Every child deserves access to a good quality education, and children with autism are no exception.

The truth is, children with autism *are* interested in learning, and they need to be supported properly.

So what about the relationship between anxiety and autism? Alexithymia, emotional acceptance and intolerance of uncertainty, play a critical role. These factors account for 64% of the relationship between autism and anxiety. Those on the autism spectrum have enough difficulty identifying and understanding their own emotions, never mind the emotions of others. This is the reason why they are around five times more likely to develop anxiety – and it's very difficult for autistics to cope with anxiety. Anxiety is one of the most common reasons why those with the condition seek support from health professionals.

Mindfulness has been found to be of some help in the treatment of anxiety in autism, but even those autistics with high intelligence often have difficulties coping with uncertainty and have problems in accepting [negative] emotional experiences. They also suffer from an inability to recognise emotions in others and struggle to put feelings into words.

Social stigma towards people with autism has seen people with the condition described as cold, antisocial, and disinterested in others and this is unfair – people with autism just see the world in a different way and they express themselves differently. Most autistics are just as emotionally caring as everyone else but alexithymia stops them feeling empathy and therefore stops them being demonstrative.

Mindfulness-based interventions are currently the most effective in terms of alleviating anxiety in autism. Mindfulness is designed to foster an individuals' awareness of moment-by-moment experiences, including current thoughts and experiences, emotions and sensations. Mindfulness could also be effective in alleviating anxiety in those with autism by improving their ability to identify, understand, and accept their emotions.

These findings have been widely published in the *Journal of Abnormal Psychology*.

Because autistics are unable to live up to the expectations of others in this regard, this social stigma can cause anxiety in those on the spectrum. So it begs the question, why can't society be more tolerant? It seems to me that a great opportunity is being missed. *Instead of trying to 'cure' those with autism, something which is impossible anyway, it would be better to re-educate the rest of society to appreciate that although people with autism can be distant emotionally, even cold, they have talents and gifts which are just as important as other talents and skills – and to the rest of us.*

We used to try to 'cure' homosexuals because they were 'different'. It took centuries to stop that kind of barbarism, so why are we now treating autism the same? Why do we think we have a right to do that?

So far, there has been no treatment for autism that has succeeded in improving or modifying symptoms in the long-term. But according to a paper published in *The Lancet* on 25 October 2016, there is now a new technique that can help parents improve their autistic child's communication skills. Pre-School Autism Communication Therapy (PACT) will be taught to NHS therapists from January 2017.

This new technique is beautiful by virtue of its simplicity and its humanity! It doesn't involve any drugs or medicines, but it does involve the people closest and most important to the child. For the first time, parents are being trained to enhance their own awareness

and response to their child's unique direct and indirect ways of communicating. This will help them to reciprocate in an appropriately focused way. Parents will be able to see beyond the unusualness of what the child is actually trying to communicate. This has an additional benefit in that it encourages the child's social understanding and communication development.

Researchers at the University of Manchester, King's College London and Newcastle University, have found that training parents to identify, understand and interpret their autistic child's patterns of communication at a very young age has a significant effect on reducing the severity of the child's autism symptoms. Further, this positive effect continues for at least six years after the treatment. Children whose parents used the technique when their child was aged between two and four had less severe overall symptoms six years after it was put into practice – they also gained improved social communication and reduced repetitive behaviours.

Parents who took part in the trial watched videos of themselves interacting with their children and received feedback from therapists who then gave tips and guidance. In addition, parents took part in 12 therapy sessions over a six-month period as well as 30 minutes a day of planned communication and play activities. This was followed up with monthly support sessions over the next six months. The study involved 152 families with autistic children aged two to four. 121 of the participants were re-assessed after six years. Of these, 59 had taken the PACT course.

Symptoms in the treated children were found to be less severe, although no changes were seen in other areas such as language, anxiety and challenging behaviour – additional techniques will be needed to address these difficulties. Nonetheless, the researchers regard the results as hugely significant.

To measure the success of their work, autism severity was scored from 1 to 10 using a standard international scale combining social communication and behaviour symptoms. The results showed a 17% reduction in the proportion of children suffering severe symptoms from the PACT group. The findings suggest that sustained changes in autism symptoms are possible with early intervention, something previously regarded as difficult to achieve.

The advantage of this new approach over child/therapist based intervention is that it has the potential to affect the everyday life of the child in a positive way and represents an improvement in the core symptoms of autism previously thought resistant to change. Autism charities have hailed the discovery as the first in the world to be proven to provide a sustained improvement. They said the findings could improve the lives of thousands of autistic children.

The technique is by no means a cure in the conventional sense of the word, because children will still retain some symptoms, but it does suggest that teaching parents to better communicate with their children can lead to improvements in symptoms in the long-term. In other words, parents can help their autistic child manage their behaviour more efficiently. Courses such as the Early-Bird Programme help families to support children diagnosed with autism but this study is the first to achieve a sustained improvement.

According to an economic analysis of the condition's impact, autism costs the UK economy £32billion a year – more than any other medical condition, and more than the cost of cancer, strokes and heart disease combined. The cost is high because of the costs of residential accommodation, medical care and loss of productivity linked to a condition

that is life-long. The researchers say that underlines the importance of developing effective treatments that can be introduced early in life.

The best news is that scientists have recently discovered a surprising connection between intelligence and autism. Researchers from the Centre for Neurogenomics and Cognitive Research in Amsterdam have discovered 40 new genes linked to human intelligence – most of which are mainly expressed in brain tissue – and found that many people with those genes were also on the autistic spectrum. The discovery could one day help shed light on the condition's origins and also lead to new insights into the neurological and developmental bases of human intelligence, but for the time being, it confirms that autistic people really do have an intelligence we should all respect.

In the meantime… scientists at the University of Chichester have discovered drumming to rock music for 60 minutes each week could help children with autism. The researchers found that youngsters on the spectrum were better able to interact with their school peers after taking part in the sessions. This offers hope as autism spectrum disorder children are known to struggle in social situations. Maybe it's the rhythm of the drumming or even letting off steam on a drum kit that's responsible for the I'm movement, but the trial also suggested the drumming could help the children follow instructions from their teacher more easily, which in turn would help them in lessons.

The researchers studied 19 children at Milestone School in Gloucester, all of whom were on the spectrum. Their parents and staff at the school were asked to make observations of the pupils before, during and after the sessions which were carried out over 10 weeks. Each child had two weekly 30-minute drumming sessions, the emphasis being on having fun, given by tutors using electronic kits provided by charities in Gloucestershire.

Over the course of the study, the researchers found the children showed a significant improvement in dexterity, rhythm and timing. The youngsters also performed better in daily tasks outside school, including being better able to concentrate on homework. Teachers reported the pupils were also better able to concentrate at school and showed enhanced communication with peers and teachers.

The investigation is a continuation of research in conjunction with the Clem Burke Drumming Project (CBDP). Mr Burke, aka 'The Doctor of Rock' was the drummer for Blondie, a popular beat combo in the 1980s and 90s. The project aims to demonstrate through science, the value of learning how to play the drums for school children. The project has demonstrated the positive impact on a pupil's health and wellbeing following rock drumming practice as a potent intervention for individuals experiencing brain disorders, such as autism.

Google Glass can help children with autism read facial expressions to assess people's emotions. Children with autism often fail to recognise basic facial emotions, which can make social interaction and making friends difficult. Researchers at Stanford University School of Medicine used the internet-connected eyewear, which includes a small display fixed to the wearer's glasses and which displays information. The software reads facial expressions captured by the camera on the front of the glasses and provides social cues to the wearer on the display.

The project – called Superpower Glass – was carried out with 14 families with a child aged between three and 17 with a clinically confirmed autism diagnosis and taught the children to recognise the emotions conveyed in people's facial expressions. As the child interacts with others, an app identifies and names their emotions through the Google Glass speaker or

screen. The app used machine learning to recognise eight core facial expressions – happiness, sadness, anger, disgust, surprise, fear, neutral and contempt.

After between one to three months of regular use, parents reported their autistic children made eye contact more regularly and related better to others. With some, their autism got better, and some dropped from severe to moderate. One of the children – Alex, aged nine – could not look people in the eye despite gentle encouragement from his mother. A few weeks into the trial, Alex began to realise that people's faces hold clues to their feelings. Other parents commented *'a switch has been flipped… my child is looking at me… suddenly the teacher is telling me that my child is engaging in the classroom…'*

Unfortunately, Google has discontinued the product because of poor sales.

The study was published in the journal *Digital Medicine*.

A Canadian research project at McGill University in Montreal has discovered that autistic children who learn to speak another language might find it easier to 'switch gears'. Children on the spectrum often find difficulty switching their attention from one task to another.

Parents are often told not to bother teaching their child a second language if they are at all autistic because of fears it will add to their difficulties. But being bilingual could increase their cognitive flexibility. It has long been known that living as a bilingual person and having to switch languages increases cognitive flexibility, but no one has yet demonstrated that this advantage may also extend to children on the autism spectrum. The McGill study involved 40 children in a French speaking part of Canada who were all on the spectrum. The study, published in the journal *Child Development*, suggests that learning a second language could also help dampen some of the symptoms of autism.

Forty children involved in the experiment were aged between six and nine and were divided into four groups. Twenty children were bilingual, with half having ASD. The other twenty children, of which half also had ASD, could only speak one language. They were all asked to sort blue rabbits and red boats on a computer screen by colour. They were then asked to switch and sort the same objects instead by their shape, regardless of their colour. The study found bilingual children with ASD performed significantly better than their monolingual peers when it came to the more complex part of the test.

Despite the small sample size, the researchers believe the 'bilingual advantage' they saw in children with ASD has highly significant implications. Further studies are planned to follow the children with ASD that they tested over the next three to five years to see how they develop. The aim is to find out if the bilingual advantage they observed in the lab may also be observed in daily life as the children age.